Impact AGRI-CUM-2: The Specific Plan, together with development under the 1990 General Plan, would allow development which would change the existing environment from farmland to non-agricultural uses.

Mitigation Measure AGRI-CUM-2: See Mitigation Measure AGRI-1.

Significance After Mitigation: There is no mitigation which would halt the loss of the agricultural land in the Specific Plan Area, although preservation of 254.54 acres of land outside the Specific Plan area for Agricultural or Open Space uses does reduce the impact. Therefore, although the Specific Plan's contribution is somewhat mitigated, the cumulative loss of agricultural land under the 1990 General Plan is s*ignificant and unavoidable.*

3. With Proposed General Plan Update[19]

The Preferred Land Use Alternative map, prepared as part of the Proposed General Plan Update, shows the land uses east of Leisure Town Road as primarily Low and Low Medium Residential, with a few pockets of Commercial and Business/Industrial. This represents a change from the current allowed land uses, which are primarily residential estate and agricultural. If adopted, this change in land use would allow development on agricultural/farm land in addition to that which is indicated in the 1990 General Plan, the Specific Plan, and in reasonably foreseeable projects and plans as described above. However, because CEQA requires that a project's impacts be evaluated in relation to the "physical environmental conditions" of the Specific Plan area, and not in relation to adopted or proposed land use regulations, the Specific Plan's impact of converting farmland to non-agricultural use would be the same under the Preferred Land Use Alternative. The proposed project's contribution to cumulative change would remain the same for direct conversion to non-agricultural use, but potential conflicts with agriculturally zoned land would be less, as the Proposed General Plan Update, unlike under the 1990 General

[19] Land uses are shown on the Preferred Land Use Alternative accepted by the City Council on December 13, 2011. Although the update is in progress, and the General Plan in draft form, policies are subject to change.

Plan, would designate lands to the north and south of the Specific Plan area to urban land uses. Thus there would no longer be a conflict with agricultural zoning.

4.3 AIR QUALITY

This section has been prepared using methodologies and assumptions recommended in the air quality impact assessment guidelines of the Yolo-Solano Air Quality Management District (YSAQMD).[1] In keeping with these guidelines, this section describes existing air quality in Vacaville and the Sacramento Valley Air Basin, impacts of future traffic on local carbon monoxide levels, impacts of land use related vehicular emissions that have regional effects, and other effects of the Specific Plan related to air quality. Mitigation measures to reduce or eliminate potentially significant air quality impacts are identified, where appropriate.

A. Regulatory Framework

This section summarizes existing local, State, and federal laws, policies, and regulations that apply to air quality in and around Vacaville.

In Vacaville, the YSAQMD is the primary agency responsible for regulating air pollution emissions from stationary sources (e.g. factories) and indirect sources (e.g. traffic associated with new development), as well as for monitoring ambient pollutant concentrations at the regional level. Air pollution emissions are regional in nature, so it is important for the cities within the region, such as Vacaville, to work together with YSAQMD to achieve State and federal clean air standards. In addition, the California Air Resources Board (CARB) and the U.S. Environmental Protection Agency (EPA) regulate direct emissions from motor vehicles.

Both the State and federal governments have established health-based Ambient Air Quality Standards for six air pollutants: carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), and suspended particulate matter (PM). In addition, the State has set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particles.

[1] Yolo-Solano AQMD, 2007. *Handbook for Assessing and Mitigating Air Quality Impacts.*

These standards are designed to protect public health and welfare with a reasonable margin of safety.

In addition to primary and secondary Ambient Air Quality Standards, the State of California has established a set of episode criteria for O_3, CO, NO_2, SO_2, and PM. These criteria refer to episode levels representing periods of short-term exposure to air pollutants that actually threaten public health. Health effects are progressively more severe as pollutant levels increase from Stage One to Stage Three.

California Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS) for the criteria air pollutants are listed in Table 4.3-1. Health effects of these criteria pollutants are described in Table 4.3-2.

1. Federal Clean Air Act

The Federal 1970 Clean Air Act (FCAA) authorized the establishment of national health-based air quality standards and set deadlines for their attainment. The Federal Clean Air Act Amendments of 1990 changed deadlines for attaining NAAQS as well as the remedial actions required of areas of the nation that exceed the standards. Under the Clean Air Act, State, and local agencies in areas that exceed the NAAQS are required to develop State Implementation Plans (SIP) to show how they will achieve the NAAQS by specific dates. Vacaville is included in the Sacramento Regional SIP prepared by the Sacramento Metropolitan Air Quality Management District in conjunction with the YSAQMD. Other jurisdictions located in Sacramento and Yolo Counties, and portions of Placer, El Dorado, Solano, and Sutter Counties are also included in this SIP.

2. State Laws and Regulations

This section summarizes State laws and regulations pertaining to air quality in Vacaville.

TABLE 4.3-1 **CALIFORNIA AND NATIONAL AIR QUALITY STANDARDS**

Pollutant	Average Time	California Standards[a]	Federal Standards[b]	
		Concentration[c]	Primary[c,d]	Secondary[c,e]
Ozone (O_3)	1-Hour	0.09 ppm (180 $\mu g/m^3$)	No federal standard	Same as Primary Standard
	8-Hour	0.07 ppm (137 $\mu g/m^3$)	0.075 ppm (147 $\mu g/m^3$)	
Respirable Particulate Matter (PM_{10})	24-Hour	50 $\mu g/m^3$	150 $\mu g/m^3$	Same as Primary Standard
	Annual Arithmetic Mean	20 $\mu g/m^3$	–	
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	No Separate State Standard	35 $\mu g/m^3$	Same as Primary Standard
	Annual Arithmetic Mean	12 $\mu g/m^3$	15 $\mu g/m^3$	
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	None
	1-Hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	
	8-Hour Lake Tahoe	6 ppm (7 mg/m^3)	–	
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.03 ppm (57 $\mu g/m^3$)	0.053 ppm (100 $\mu g/m^3$)	Same as Primary Standard
	1-Hour	0.18 ppm (339 $\mu g/m^3$)	0.100 ppm [f]	None
Lead (Pb)[g]	30-Day Avg	1.5 $\mu g/m^3$	–	–
	Calendar Quarter	–	1.5 $\mu g/m^3$	Same as Primary Standard
	Rolling 3-Month Avg[g]	–	0.15 $\mu g/m^3$	
Sulfur Dioxide (SO_2)	24-Hour	0.04 ppm (105 $\mu g/m^3$)	-	–
	3-Hour	–	–	0.5 ppm (1300 $\mu g/m^3$)
	1-Hour	0.25 ppm (655 $\mu g/m^3$)	0.75 ppm	
	8-Hour	Extinction co-efficient of 0.23 per kilometer–visibility of 10 miles or more (0.07–30 miles or more for Lake Ta-hoe) due to particles	No Federal Standards	

TABLE 4.3-1 **CALIFORNIA AND NATIONAL AIR QUALITY STANDARDS** (CONTINUED)

Pollutant	Average Time	California Standards[a]	Federal Standards[b]	
		Concentration[c]	Primary[c,d]	Secondary[c,e]
		when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		
Visibility-Reducing Particles	24-Hour	25 $\mu g/m^3$		
Sulfates	1-Hour	0.03 ppm (42 $\mu g/m^3$)		
Hydrogen Sulfide	24-Hour	0.01 ppm (26 $\mu g/m^3$)		
Vinyl Chloride[h]				

Note: ppm = parts per million

[a] California standards for O_3, CO (except for Lake Tahoe), SO_2 (1- and 24-hour), NO_2, suspended particulate matter—PM_{10}, $PM_{2.5}$, and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded. CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

[b] National standards (other than O_3, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O_3 standard is attained when the fourth highest eight-hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m3$ is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98% of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact EPA for further clarification and current federal policies.

[c] Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

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

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

[f] To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor must not exceed 0.100 ppm (effective January 22, 2010).

[g] The CARB has identified Pb and vinyl chloride as "toxic air contaminants (TACs)" with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[h] National Pb standard, rolling 3-month average: final rule signed October 15, 2008.

Source: California CARB, September 10, 2010.

TABLE 4.3-2 **HEALTH EFFECTS OF AIR POLLUTANTS**

Pollutant	Health Effects	Examples of Sources
Suspended Particulate Matter ($PM_{2.5}$ and PM_{10})	¨ Reduced lung function ¨ Aggravation of the effects of gaseous pollutants ¨ Aggravation of respiratory and cardio respiratory diseases ¨ Increased cough and chest discomfort ¨ Soiling ¨ Reduced visibility	¨ Stationary combustion of solid fuels ¨ Construction activities ¨ Industrial processes ¨ Atmospheric chemical reactions
Ozone (O_3)	¨ Breathing difficulties ¨ Lung damage	¨ Formed by chemical reactions of air pollutants in the presence of sunlight; common sources are motor vehicles, industries, and consumer products
Carbon Monoxide (CO)	¨ Chest pain in heart patients ¨ Headaches, nausea ¨ Reduced mental alertness ¨ Death at very high levels	¨ Any source that burns fuel such as cars, trucks, construction and farming equipment, and residential heaters and stoves
Lead (Pb)	¨ Organ damage ¨ Neurological and reproductive disorders ¨ High blood pressure	¨ Metals processing ¨ Fuel combustion ¨ Waste disposal
Nitrogen Dioxide (NO_2)	¨ Lung damage	¨ See carbon monoxide sources
Toxic Air Contaminants (TACs)	¨ Cancer ¨ Chronic eye, lung, or skin irritation ¨ Neurological and reproductive disorders	¨ Cars and trucks, especially diesels ¨ Industrial sources such as chrome platers ¨ Neighborhood businesses such as dry cleaners and service stations

Source: CARB and EPA, 2005.

a. California Clean Air Act

In 1988, the California Clean Air Act (CCAA) required that all air districts in the State endeavor to achieve and maintain California Ambient Air Quality Standards (CAAQS) for CO, O_3, SO_2, and NO_2 by the earliest practical date. The CCAA provides air districts with authority to regulate indirect sources and mandates that air districts focus particular attention on reducing emissions from transportation and area-wide emission sources. The CARB designates areas as either attainment or nonattainment for each criteria pollutant based on whether the CAAQS have been achieved. Each nonattainment district is required to adopt a plan to achieve a 5 percent annual reduction, averaged over consecutive three-year periods, in district-wide emissions of each nonattainment pollutant or its precursors. A Clean Air Plan shows how an air district would reduce emissions to achieve air quality standards. As shown in Table 4.3-1, State standards for these pollutants (i.e. the CAAQS) are generally more stringent than the national standards (i.e. the NAAQS).

The YSAQMD has adopted several attainment plans to achieve State and federal air quality standards and comply with CCAA requirements, the latest of which is the Triennial Assessment and Plan Update from May 2010.[2]

b. California Air Resources Board

The CARB administers the air quality standards in California. Based on air monitoring results for areas within California, the CARB designates the areas as either attainment or nonattainment for each criteria pollutant based on whether the CAAQS have been achieved.

Under the CCAA, areas are designated as nonattainment for a pollutant if air quality data shows that a State standard for the pollutant was violated at least once during the previous three calendar years.

The CARB has developed an Air Quality and Land Use Handbook (Handbook) that is intended to serve as a general reference guide for evaluating and

[2] Yolo-Solano AQMD, 2010. *Triennial Assessment Plan Update.*

reducing air pollution impacts associated with new projects that go through the land use decision-making process.[3] The Handbook recommends that planning agencies strongly consider proximity to air pollution sources when finding new locations for "sensitive" land uses such as homes, medical facilities, daycare centers, schools, and playgrounds. The YSAQMD has also adopted these recommendations as their screening distances for siting of new sensitive receptors.

Air pollution sources of concern include freeways, rail yards, ports, refineries, distribution centers, chrome plating facilities, dry cleaners, and large gasoline service stations. Key recommendations in the Handbook include taking steps to avoid siting new, sensitive land uses:

- Within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day.
- Within 1,000 feet of a major service and maintenance rail yard.
- Immediately downwind of ports (in the most heavily impacted zones) and petroleum refineries.
- Within 300 feet of any dry cleaning operation (for operations with two or more machines, provide 500 feet).
- Within 300 feet of a large gas station (defined as a facility with a throughput of 3.6 million gallons per year or greater).

The Handbook specifically states that its recommendations are advisory and acknowledges that land use agencies have to balance other considerations, including housing and transportation needs, economic development priorities, and other quality of life issues.

c. Yolo-Solano Air Quality Management District

The YSAQMD is tasked with achieving and maintaining healthful air quality for its residents by establishing programs, plans, and regulations enforcing air

[3] California Air Resources Board, 2005. *Air Quality and Land Use Handbook: A Community Health Perspective.*

pollution control rules in order to attain all State and federal ambient air quality standards and to minimize public exposure to airborne toxins and nuisance odors. The YSAQMD has adopted several attainment plans to achieve State and federal air quality standards and comply with CCAA and FCAA requirements. The YSAQMD continuously monitors its progress in implementing attainment plans and must periodically report to the CARB and the EPA. The YSAQMD, in partnership with the five air districts in the Sacramento Metropolitan Area, the CARB, and the Sacramento Area Council of Governments (SACOG), periodically revises its attainment plans to reflect new conditions and requirements in accordance with schedules mandated by the CCAA and FCAA.

The 1994 Sacramento Area Regional Ozone Attainment Plan is the current federal ozone SIP for the YSAQMD, and sets out stationary source control programs and statewide mobile source control programs for attainment of the 1-hour ozone standard. The air districts of the Sacramento region have also prepared an 8-hour Ozone Rate of Progress Plan that shows a 3 percent per year emission reduction in volatile organic compounds (or the NO_2 equivalent) for six years through 2008. This plan continues the strategies found in the 1-hour ozone SIP. The EPA's June 2005 revocation of the 1-hour ozone standard and enactment of the 8-hour ozone standard required the air districts and the CARB to prepare a new attainment demonstration SIP. The latest SIP for the 8-hour ozone standard, the 2009 Sacramento Metropolitan Area 8-Hour Ozone Attainment Plan, contains additional control measures to demonstrate that the region will attain the 8-hour standard by the target date of 2018.

The YSAQMD primary means of implementing air quality plans is by adopting rules and regulations. The Health and Safety Code (H&SC) §42300 et. seq. authorizes air quality management districts to adopt rules and regulations and to pursue civil and criminal penalties for violations. The YSAQMD rulebook contains more than 85 rules. Some new rules adopted by YSAQMD apply to sources never before regulated, such as Rule 2.40 – Wood Burning Appliances, which prohibits installation of any new traditional

"open hearth" type fireplaces within YSAQMD's jurisdiction. Woodstoves however are permitted in the jurisdiction.

In addition to the YSAQMD's primary role of controlling stationary sources of pollution, the YSAQMD is required to implement transportation control measures and identify indirect source control programs to reduce mobile source emissions. To accomplish this, the YSAQMD works closely with cities, including the City of Vacaville, and with counties and regional transportation planning agencies.

3. Attainment Status

Areas that do not violate ambient air quality standards are considered to have attained the standard. Violations of ambient air quality standards are based on air pollutant monitoring data and are judged for each air pollutant. The YSAQMD does not meet CAAQS or NAAQS for ground level ozone, nor State standards for PM_{10} and national standards for $PM_{2.5}$.[4] Table 4.3-3 provides a summary of the YSAQMD's attainment status.

Table 4.3-4 presents guiding and implementing policies from the current City of Vacaville General Plan relevant to air quality and the proposed Brighton Landing Specific Plan; all air quality polices are contained within the Conservation Element.

B. Existing Conditions

This section summarizes the criteria air pollutants and their sources in addition to existing air quality conditions in the vicinity of the Specific Plan.

[4] Although there were no exceedances of the federal $PM_{2.5}$ standard recorded at the Davis monitoring station, other exceedances within the Yolo-Solano Air District prevent the YSAQMD from meeting this standard.

TABLE 4.3-3 **YOLO-SOLANO AIR QUALITY MANAGEMENT DISTRICT ATTAINMENT STATUS**

Pollutant	Averaging Time	State Standards	National Standards
Ozone (O_3)	1-Hour	Nonattainment	N/A[a]
	8-Hour	Nonattainment	Nonattainment
Carbon Monoxide (CO)	1-Hour	Attainment	Unclassified Attainment[b]
	8-Hour	Attainment	Unclassified Attainment
Nitrogen Dioxide (NO_2)	1-Hour	Attainment	N/A
	Annual	N/A	Attainment
Sulfur Dioxide (SO_x)	1-Hour	Attainment	N/A
	24-Hour	Attainment	Attainment
	Annual	N/A	Attainment
Particulate Matter (PM_{10})	24-Hour	Nonattainment	Unclassified
	Annual Average	Nonattainment	N/A
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	N/A	Partial Nonattainment
	Annual Average	N/A	Attainment
Sulfates	24-Hour	Attainment	N/A
Lead (Pb)	30-Day Avg.	Attainment	N/A
	Calendar Qtr	N/A	Attainment
Hydrogen Sulfide	1-Hour	Attainment	N/A
Vinyl Chloride	24-Hour	Attainment	N/A
Visibility Reducing Particles	8-Hour	Attainment	N/A

[a] N/A – Not applicable. State or federal standard does not exist for the combination of pollutant and averaging time.

[b] Unclassified areas are those for which air monitoring has not been conducted but which are assumed to be in attainment.

Source: Yolo-Solano Air Quality Management District, 2012.

TABLE 4.3-4 **CITY OF VACAVILLE GENERAL PLAN POLICIES RELEVANT TO AIR QUALITY**

Policy Number	Policy
Policy 6.4-I 3	Favor Transportation Systems Management (TSM) programs that limit vehicle use over those that extend the commute hour.
Policy 8.3-G 1	Maintain good air quality in the Vacaville Planning Area.
Policy 8.3-G 2	Cooperate with regional agencies in developing and implementing air quality management plans.
Policy 8.3-I 1	Encourage project design that conserves air quality and minimizes direct and indirect emissions of air contaminants.
Policy 8.3-I 2	Encourage transportation modes that minimize motor vehicle use and resulting contaminant emissions.
Policy 8.3-I 3	Consider carbon monoxide levels at intersections when evaluating the need for intersection improvements.
Policy 8.3-I 4	Encourage the use of alternative fuel vehicles through the implementation of alternative fuel infrastructure and purchase of alternative fuel, low emission vehicles by the City, transit operator, and residents when considering new vehicle purchase.

Source: Vacaville General Plan, 2007. *City of Vacaville General Plan,* Conservation Element, Chapter 8.

1. Criteria Pollutants and Monitored Air Pollutant Levels

Air quality is a function of both local climate and local sources of air pollution. Air quality is the balance of the natural dispersal capacity of the atmosphere and emissions of air pollutants from human uses of the environment. Pollutants can be diluted by both vertical and horizontal mixing in the atmosphere. Vertical mixing and dilution of pollutants are often suppressed by inversion conditions, when a warm layer of air traps cooler air close to the surface. During the summer, inversions are generally elevated above ground level, but are present over 90 percent of both the morning and afternoon hours. In winter, surface-based inversions dominate in the morning hours, but frequently dissipate by afternoon.

Pollutant monitoring results for the years 2008 to 2010 at nearby monitoring station to the City of Vacaville indicate that air quality in the Vacaville area has generally been moderate. These results are shown in Table 4.3-5.

a. Carbon Monoxide (CO)

CO is formed by the incomplete combustion of fossil fuels, almost entirely from automobiles. It is a colorless, odorless gas that can cause dizziness, fatigue, and impairments to central nervous system functions. CO passes through the lungs into the bloodstream, where it interferes with the transfer of oxygen to body tissues. State and federal CO standards have not been exceeded in the study area for the last three years at the closest monitoring site for this pollutant.

b. Ozone (O_3)

Rather than being directly emitted, ozone is formed by photochemical reactions between NO_2 and reactive organic gases (ROGs). Ozone is a pungent, colorless gas. Elevated ozone concentrations result in reduced lung function, particularly during vigorous physical activity. This health problem is particularly acute in sensitive receptors such as the sick, elderly, and young children. Ozone levels peak during the summer and early fall months. State 1-hour ozone standards were exceeded each year from 2008 through 2010 at the Vacaville monitoring station. Both federal and State 8-hour ozone standards were also exceeded each year from 2008 through 2010 at the closest monitoring site for this pollutant.

c. Particulate Matter (PM)

Particulate matter is the term used for a mixture of solid particles and liquid droplets found in the air. Coarse particles are those that are larger than 2.5 microns but smaller than 10 microns, or PM_{10}. $PM_{2.5}$ refers to fine suspended particulate matter with an aerodynamic diameter of 2.5 microns or less that is not readily filtered out by the lungs. Nitrates, sulfates, dust, and combustion particulates are major components of PM_{10} and $PM_{2.5}$. These small particles can be directly emitted into the atmosphere as by-products of fuel combustion; through abrasion, such as tire or brake lining wear; or through fugitive

TABLE 4.3-5 **AIR POLLUTANT MONITORING DATA**

Pollutant	Standard	2008	2009	2010
Carbon Monoxide (CO)[a]				
Maximum 1-hour concentration (ppm)		3	3	3
Number of days exceeded:	State: > 20 ppm	0	0	0
	Federal: > 35 ppm	0	0	0
Maximum 8-hour concentration (ppm)		2	2	2
Number of days exceeded:	State: > 9 ppm	0	0	0
	Federal: > 9 ppm	0	0	0
Ozone (O_3)[b]				
Maximum 1-hour concentration (ppm)		0.112	0.106	0.105
Number of days exceeded:	State: > 0.09 ppm	4	3	2
Maximum 8-hour concentration (ppm)		0.093	0.085	0.078
Number of days exceeded:	State: > 0.07ppm	7	2	3
	Federal: > 0.075 ppm	4	2	1
Coarse Particulates (PM_{10})[c]				
Maximum 24-hour concentration ($\mu g/m^3$)		60.1	25.3	34.1
Number of days exceeded:	State: > 50 $\mu g/m^3$	1	0	0
	Federal: > 150 $\mu g/m^3$	0	0	0
Annual arithmetic average concentration ($\mu g/m^3$)		16.5	13.6	12.7
Exceeded for the year:	State: > 20 $\mu g/m^3$	No	No	No
Fine Particulates ($PM_{2.5}$)[a]				
Maximum 24-hour concentration ($\mu g/m^3$)		50.0	38.9	29.5

TABLE 4.3-5 **AIR POLLUTANT MONITORING DATA** (CONTINUED)

Pollutant	Standard	2008	2009	2010
Number of days exceeded:	Federal: > 35 µg/m^3	7	5	0
Annual arithmetic average concentration (µg/m^3)		9.9	9.7	7.7
Exceeded for the year:	State: > 12 µg/m^3	No	No	No
	Federal: > 15 µg/m^3	No	No	No
Nitrogen Dioxide (NO_2)[a]				
Maximum 1-hour concentration (ppm)		0.067	0.049	0.055
Number of days exceeded:	State: > 0.18 ppm	0	0	0
Annual arithmetic average concentration (ppm)		0.010	0.010	0.009
Exceeded for the year:	Federal: > 0.053 ppm	No	No	No
Sulfur Dioxide (SO_2)[a]				
Maximum 1-hour concentration (ppm)		0.008	0.010	0.011
Number of days exceeded:	State: > 0.25 ppm	0	0	0
Maximum 3-hour concentration (ppm)		ND	ND	ND
Number of days exceeded:	Federal: > 0.5 ppm	ND	ND	ND
Maximum 24-hour concentration (ppm)		0.003	0.003	0.002
Number of days exceeded:	State: > 0.04 ppm	0	0	0
	Federal: > 0.14 ppm	0	0	0
Annual arithmetic average concentration (ppm)		0.000	0.000	0.000
Exceeded for the year:	Federal: > 0.030 ppm	No	No	No

Notes: ppm = parts per million. µg/m^3 = micrograms per cubic meter.
ND = No data. There was insufficient (or no) data to determine the value.
[a] 304 Tuolumne St., Vallejo was the closest monitoring station for this pollutant.
[b] 2012 Ulatis Drive, Vacaville was the closest monitoring station for this pollutant.
[c] 650 Merchant Street, Vacaville was the closest monitoring station for this pollutant.
Source: CARB and EPA, 2012.

dust (wind or mechanical erosion of soil). They can also be formed in the atmosphere through chemical reactions.

Particulates may transport carcinogens and other toxic compounds that adhere to the particle surfaces, and can enter the human body through the lungs. As indicated in the monitoring results, there was only one violation of the State PM_{10} standard during the three-year period and no recorded violations of the federal PM_{10} standard. $PM_{2.5}$ maximum 24-hour concentration levels exceed the federal standard seven times in 2008, five times in 2009, and no times in 2010; no violations of the State $PM_{2.5}$ Annual Arithmetic Average standard were recorded during the three-year period at the closest monitoring site for this pollutant.

d. Nitrogen Oxides (NO_2 and NO)

NO_2, a reddish-brown gas, and nitric oxide (NO), a colorless, odorless gas, are formed from fuel combustion under high temperature or pressure. These compounds are referred to as nitrogen oxides, or NO_2. NO_2 is a primary component of the photochemical smog reaction. NO_2 also contributes to other pollution problems, including a high concentration of fine particulates ($PM_{2.5}$), poor visibility, and acid deposition. NO_2 decreases lung function and may reduce resistance to infection. NO_2 standards have not been exceeded at the closest monitoring site for this pollutant.

e. Sulfur Dioxide (SO_2)

SO_2 is a colorless, irritating gas formed primarily from incomplete combustion of fuels containing sulfur. Industrial facilities also contribute to gaseous SO_2 levels in the region. SO_2 irritates the respiratory tract, can injure lung tissue when combined with $PM_{2.5}$, and reduces visibility and the level of sunlight. The maximum 1-hour and 24-hour SO_2 standards have not been exceeded in the last three years at the closest monitoring site for this pollutant. No data was available for the maximum 3-hour concentration values for monitoring stations in the project vicinity.

2. Existing Sources of Air Pollution

The primary source of air pollution in the City of Vacaville is from on-road mobile sources such as automobiles, trucks, motorcycles, buses, and motor homes. These sources account for the majority of the City's ozone precursor emissions. On-road mobile source emissions are directly related to regional vehicle miles traveled (VMT) on both local roadways and interstate freeways. As population growth in the region occurs, VMT increases, resulting in increased ozone precursor emissions. Particulate emissions are generated by woodsmoke from residential fireplaces and from construction activities. Consumer products, architectural coatings, fertilizers, and asphalt paving are also sources of air pollution within the vicinity of the Specific Plan. Agricultural operations such as harvesting and tilling in the region account for a portion of the area's PM emissions. Mobile source agricultural equipment emissions account for less than 10 percent of the region's mobile source emissions.

3. Toxic Air Contaminants (TACs)

In addition to the criteria pollutants discussed above, TACs are another group of pollutants of concern. TACs are injurious in small quantities and are regulated by the EPA and the CARB. Health risks from TACs are a function of both concentration and duration of exposure. Some examples of TACs include: benzene, butadiene, formaldehyde, and hydrogen sulfide. The identification, regulation and monitoring of TACs is relatively recent compared to that for criteria pollutants.

While TACs are produced by many different sources, the largest contributor to inhalation cancer risk in California is particulate matter from diesel-fueled engines (diesel PM). Exposure to diesel PM can result in an increased risk of cancer and an increase in chronic non-cancer health effects, including a greater incidence of cough, labored breathing, chest tightness, wheezing, and bronchitis. These risks generally affect sensitive receptors near the emission source. The CARB reports that the average cancer risk statewide from exposure to diesel PM was estimated to be over 500 potential cases per million in 2007. Diesel PM was estimated to be responsible for about 70 percent of total

risks from all toxics. On a local scale, diesel PM can present varying cancer risks to the public, which can be greater or less than the statewide average.

The CARB developed the "Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles," which sets a goal of 75 percent reduction of diesel PM by 2010 and an 85 percent reduction by 2020. High volume freeways, stationary diesel engines, and facilities attracting heavy and constant diesel vehicle traffic (distribution centers, truck stops) were identified as posing the highest risk to adjacent receptors. Other facilities associated with increased risk include warehouse distribution centers, large retail or industrial facilities, high volume transit centers or schools with a high volume of bus traffic. The risk from diesel PM is expected to decrease over time due to increased engine regulations.

4. Existing Sensitive Receptors

Sensitive receptors refer to those segments of the population most susceptible to poor air quality (i.e. children, elderly, and the sick) and to certain at-risk sensitive land uses such as schools, hospitals, parks, or residential communities. Air quality problems arise when sources of air pollutants and sensitive receptors are located near one another. The potential for adverse air quality impacts increases as the distance between the source of emissions and members of the public decreases. Impacts on sensitive receptors are of particular concern when air emission sources are located nearby.

The Specific Plan would construct new schools and residences, both of which would be considered sensitive receptors. Existing residences are located directly west of the project site.

5. Odors

Odors are generally regarded as an annoyance rather than a health hazard. Manifestations of a person's reaction to odors can range from psychological (e.g. irritation, anger, or anxiety) to physiological (e.g. circulatory and respiratory effects, nausea, vomiting, and headache).

The ability to detect odors varies considerably among the population and overall is quite subjective. People may have different reactions to the same odor. An unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. Known as odor fatigue, a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

Typical sources of odors include: wastewater treatment plants, landfills, certain manufacturing operations, and restaurants. Additionally, commercial services such as auto service stations, auto body shops, or other similar uses can be a source of odor complaints in urban areas where these uses are in close proximity to residential areas.

The Easterly Waste Water Treatment Plan (WWTP) is located approximately 1 mile east of the Specific Plan boundary.

C. Standards of Significance

The Specific Plan would have a significant impact with regard to air quality if it would:

1. Conflict with or obstruct implementation of the applicable air quality plan.
2. Violate any air quality standard or contribute substantially to an existing or projected air quality violation. The YSAQMD further defines the thresholds of significance as follows:
    a. Generation of ROG or NOx emissions for construction or operations in excess of 10 tons per year; or
    b. Generation of PM_{10} emissions for construction or operations in excess of 80 pounds per day.
3. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions

which exceed quantitative thresholds for ozone precursors).The YSAQMD further defines the threshold of significance as follows:

a. Emissions would be considered cumulatively considerable if they are individually significant;

b. CO impacts are also cumulatively considerable when an exceedance of CO air quality standards results from project CO emissions combined with and CO emissions from other planned projects.

4. Expose sensitive receptors to substantial pollutant concentrations.

5. Create objectionable odors affecting a substantial number of people.

D. Impact Discussion

The following section identifies the types of air quality impacts that could occur with buildout of the Specific Plan, in comparison to the Standards of Significance.

1. Conflicts with Relevant Air Quality Plans

The YSAQMD developed the latest clean air plan, the Triennial Assessment and Plan Update (Clean Air Plan) to demonstrate to the State its plan for attaining and maintaining state ambient air quality standards for ozone. The latest Clean Air Plan includes information about emission reductions previously achieved, an air emissions inventory, air quality data and trends, and commitments to achieve additional reductions in air emissions. The Clean Air Plan includes control measures implemented by the YSAQMD to reduce air pollutant emissions. These reduction measures include regulation of specific stationary sources, area sources, mobile source control measures, and incentive programs. The Clean Air Plan assumptions include a 52 percent increase in population over the entire Yolo-Solano Air Basin area between the years 1995 and 2020 based on General Plan population projections for jurisdictions within the YSAQMD. The Specific Plan would locate residences and schools in an area previously used for agriculture purposes. The increase in population in this specific location was not anticipated under the 1990

Vacaville General Plan and it is unclear based on the level of detail provided in the Clean Air Plan if the additional population that would be provided by this project was designated for other areas of Solano County. However, the Clean Air Plan accounts for increases in population growth and subsequent vehicle miles traveled through 2020 based on a forecasted emission trend. This forecast shows decreases in the overall emission inventory due to adopted control measures by the State (e.g. more stringent motor vehicle standards) and by YSAQMD levels.

The focus of the commitments made in the Clean Air Plan include the adoption of control measures for architectural coatings, industrial sources, graphic arts, stationary internal combustion engines and large water heaters and small boilers. All development associated with the Specific Plan would be required to comply with the rules established by the YSAQMD including the Clean Air Plan's architectural coatings requirements and the Specific Plan would therefore not conflict with Triennial Assessment Plan Update. Therefore, buildout of the Specific Plan would not conflict with or obstruct implementation of the applicable air quality plan resulting in a *less-than-significant* impact.

2. Violates Air Quality Standards or Contributes to Air Quality Violations

As shown in Table 4.3-2 above, the Specific Plan area is in a State and federal nonattainment area for ozone standards and a nonattainment area for State PM_{10} standards and federal $PM_{2.5}$ standards. The Specific Plan would have the potential to violate air quality standards or contribute substantially to an existing or projected air quality violation during the construction phase of the Specific Plan and in the long-term, through operational emissions.

i. Short-Term Construction Emission Impacts

The Specific Plan would require grading and excavation of soil, and other infrastructure improvements which are construction activities with a high potential for creating air pollutants. Construction dust would also continue to affect local air quality during construction of the project. Construction

activities would generate exhaust emissions from vehicles/equipment and fugitive particulate matter emissions that would affect local air quality.

Construction activities are also a source of organic gas emissions. Solvents in adhesives, non-water-based paints, thinners, some insulating materials and caulking materials would evaporate into the atmosphere and would participate in the photochemical reaction that creates urban ozone. Asphalt used in paving is also a source of organic gases for a short time after its application.

Specific Plan-related construction emissions would occur throughout the multi-year phasing of the Specific Plan. Emissions were calculated using the Urban Emission Model (URBEMIS 2007 v.9.2.4) model which was developed by the CARB and is the recommended air quality model by the YSAQMD for estimating emissions associated with land use development projects. Table 4.3-6 shows the Specific Plan construction emissions. A precise timeline for construction activities is not known at this time. However, the project would not be expected to have construction completed in less than three years. Therefore, emissions modeling assumes a three-year construction period. Construction emission estimates are included in Appendix F, Air Quality Data, of this Draft EIR.

The YSAQMD has established thresholds of significance for ozone precursors 10 tons per year and fugitive dust at 80 pounds per day. Specific Plan emissions shown in Table 4.3-6 if the Specific Plan is constructed in three years or more would not exceed the threshold for ROG and PM_{10}. However, there could still be issues from fugitive dust downwind of construction and without mitigation this would be *significant*. YSAQMD recommends implementation of construction Best Management Practices, even for projects that do not exceed PM_{10} thresholds. Therefore, implementation of mitigation measure AQ-1 would be required.

Impact AQ-1: The effects of construction activities would be increased dust fall and locally elevated levels of PM_{10} downwind of construction activity.

TABLE 4.3-6 **PROJECT CONSTRUCTION REGIONAL EMISSIONS**

	Reactive Organic Gases	Nitrogen Oxides	PM_{10}
Pounds Per Day			
Average Daily Construction Emissions	23.70	0.075	42.56
Threshold	NA	NA	80.0
Exceed? (Yes/No)	NA	NA	No
Tons Per Year			
Annual Average Construction Emissions	3.17	1.12	6.67
Threshold	10.0	10.0	NA
Exceed? (Yes/No)	No	No	NA

Notes: NA = Not Applicable. A standard has not been established for this category.
Source: LSA Associates, Inc., 2012.

Construction dust would be generated at levels that would create an annoyance to nearby properties.

Implementation of the following mitigation measures would eliminate or offset proposed project emissions from construction impacts.

Mitigation Measure AQ-1: The applicant shall submit a construction plan for the project which includes the following conditions:

- Water all active construction sites at least twice daily. Frequency should be based on the type of operation, soil, and wind exposure.
- Ensure haul trucks maintain at least 2 feet of freeboard.
- Cover all trucks hauling dirt, sand, or loose materials.
- Apply non-toxic binders (e.g. latex acrylic copolymer) to exposed areas after cut and fill operations and hydroseed area.

- Apply chemical soil stabilizers on inactive construction areas (disturbed lands within construction projects that are unused for at least four consecutive days).
- Plant vegetative ground cover in disturbed areas as soon as possible.
- Cover inactive storage piles.
- Sweep streets if visible soil material is carried out from the construction site.

Significance After Mitigation: Implementation of the above measures would control PM_{10} emissions as recommended by the YSAQMD. Therefore, there would be a *less-than-significant* impact.

ii. Long-Term Project Air Impacts

Long-term air emission impacts would be those associated with changes in land use associated with the Specific Plan. Mobile source emissions would result from vehicle trips associated with the proposed project. The URBEMIS 2007 computer program was used to calculate long-term mobile and area source emissions.

The daily and annual emissions associated with project operational trip generation and area sources are identified in Table 4.3-7 for ROG, NO_x, PM_{10}, and $PM_{2.5}$. The results indicate the project would exceed the criteria for all of the pollutants; therefore, the buildout of the Specific Plan would have a significant effect on regional air quality.

The primary emissions associated with the project are regional in nature, meaning that air pollutants are rapidly dispersed on emission or, in the case of vehicle emissions associated with the project; emissions are released in other areas of the Air Basin. Because the resulting emissions are dispersed rapidly and contribute only a small fraction of the region's air pollution, air quality in the immediate vicinity of the Specific Plan would not substantially change compared to existing conditions or the air quality monitoring data reported

TABLE 4.3-7 **PROJECT OPERATION REGIONAL EMISSIONS**

	Reactive Organic Gases	Nitrogen Oxides	PM_{10}
Pounds Per Day			
Area Source Emissions	134.02	31.05	133.08
Mobile Source Emissions	58.99	93.98	174.75
Total Emissions in Pounds Per Day	193.01	125.03	307.83
Threshold (Pounds/Day)	NA	NA	80.0
Exceed? (Yes/No)	NA	NA	Yes
Tons Per Year			
Area Source Emissions	12.33	2.82	5.45
Mobile Source Emissions	11.57	13.63	31.90
Total Emissions in Tons Per Year	23.90	16.45	37.35
Threshold (Tons/Year)	10.00	10.00	NA
Exceed? (Yes/No)	Yes	Yes	NA

Source: LSA Associates, Inc., 2012.

in Table 4.3-5. However, regional emissions would exceed the YSAQMD's significance criteria, therefore mitigation would be required.

Based on these criteria, the proposed project would have a *significant impact* on regional ozone air quality.

Impact AQ-2: Proposed project emissions from operation shown in Table 4.3-7 would exceed the threshold for NO_x, ROG, and PM_{10}; therefore, the proposed project would have a significant effect on regional air quality. It should also be noted that individual projects that have a significant effect on regional air quality also have a significant cumulative effect on regional air quality.

Mitigation Measure AQ-2: The Brighton Landing Specific Plan shall incorporate the following measures to reduce emissions associated with vehicle trip generation and area source emissions from the project:

- Provide transit facilities (e.g. bus bulbs/turnouts, benches, shelters).
- Provide bicycle lanes and/or paths, connected to the existing community-wide network.
- Where feasible, provide sidewalks and/or paths, connected to adjacent land uses, transit stops, and the existing community-wide trail network.
- The Specific Plan shall be modified to include bicycle parking standards as follows:
  - For residential development, one, sheltered, secure bicycle parking space per dwelling unit shall be required. Garages, storage sheds, utility rooms, or similar areas that can be secured from unauthorized access and are sheltered from sun and rain would satisfy this requirement without the addition of special improvements or racks. Additional convenience bicycle parking may be provided with exterior racks but does not count toward the sheltered bicycle parking requirement.
  - New parking areas created to serve nonresidential uses should provide one bicycle parking space for every 20 vehicle parking spaces, with a minimum of four bicycle spaces.
  - For all school developments, secured bicycle parking shall be provided at a minimum rate of 10 percent of the student capacity plus 3 percent of the maximum number of employees.
- All wood burning devices shall be prohibited in residential units.

Significance After Mitigation: As shown in Table 4.3-8, even with implementation of Mitigation Measure AQ-2, project emissions would exceed the YSAQMD's significance criteria for operational emissions.

TABLE 4.3-8 **MITIGATED PROJECT REGIONAL EMISSIONS**

	Reactive Organic Gases	Nitrogen Oxides	PM_{10}
Pounds Per Day			
Area Source Emissions	50.67	16.83	0.54
Mobile Source Emissions	65.50	89.97	167.30
Total Emissions in Pounds Per Day	116.17	106.80	167.84
Threshold (Pounds/Day)	NA	NA	80.0
Exceed? (Yes/No)	NA	NA	Yes
Tons Per Year			
Area Source Emissions	8.65	1.95	.01
Mobile Source Emissions	11.16	13.06	30.53
Total Emissions in Tons Per Year	19.81	15.01	30.54
Threshold (Tons/Year)	10.00	10.00	NA
Exceed? (Yes/No)	Yes	Yes	NA

Source: LSA Associates, Inc., 2012.

There is no mitigation available with currently feasible technology to reduce the Specific Plan's regional air quality impact to a less-than-significant level. Therefore, the project's regional air quality impacts would remain *significant and unavoidable.*

iii. Localized Emissions

According to the YSAQMD, if either of the following criteria is true of any intersection affected by the project traffic, then the project can be said to have the potential to create a violation of the CO standard.

- A traffic study for the project indicates that the peak-hour level of service (LOS) on one or more streets or at one or more intersections in the project

vicinity will be reduced to an unacceptable level of service (typically LOS E or F); or

- A traffic study indicates that the project will substantially worsen an already existing peak-hour LOS F on one or more streets or at one or more intersections in the project vicinity. "Substantially worsen" includes situations where delay would increase by 10 seconds or more when project-generated traffic is included.

According to the traffic analysis prepared for the project, several intersections in the project vicinity would fall to LOS D or lower under the project and cumulative conditions. Therefore, following YSAQMD guidance a CALINE-4 dispersion model was used to estimate local CO concentrations resulting from motor vehicle emissions for all intersections that would operate at a LOS D or below. Results of the analysis are shown in Table 4.3-9. Results indicate localized carbon monoxide levels at study intersections would not result in violations of the ambient air quality standards, and would represent a *less-than-significant* impact.

3. Results in Cumulatively Considerable Increases to Non-Attainment Criteria Pollutants

As discussed above, the Specific Plan would exceed the significance criteria established by the YSAQMD at the project level for both construction and operational emissions. Even with implementation of all feasible mitigation measures, buildout of the Specific Plan would result in significant and unavoidable construction and operational emissions. Projects that exceed the criteria individually would also be considered to have a significant cumulative impact. Therefore, the proposed project would have a cumulative air quality impact.

Impact AQ-3: The Specific Plan would result in considerable increases to non-attainment pollutants individually, which indicates that it would also result in cumulative increases.

TABLE 4.3-9 **CO CONCENTRATIONS AT STUDY AREA INTERSECTIONS (PPM)**

	Existing Plus Project		Existing Plus Approved Plus Project		Cumulative Plus Project	
Intersection	1-Hour	8-Hour	1-Hour	8-Hour	1-Hour	8-Hour
Leisure Town/ Ulatis Drive	4.1	3.0	4.3	3.1	3.7	2.7
Leisure Town/ Elmira Road	4.2	3.1	4.3	3.1	3.7	2.7
Leisure Town Road/Marshall Road	3.8	2.8	4.2	3.1	NA	NA
Leisure Town Road/Alamo Drive	3.8	2.8	4.2	3.1	2.4	2.6
Peabody Road/ Cliffside Drive	4.6	3.4	4.7	3.4	3.6	2.7

Notes: Includes second highest recorded background concentration of 2.2 for 8-Hour and 3.0 for 1-hour.
State CO Standard is 9.0 for 8-hour and 20.0 for 1-hour. Federal CO Standard is 9.0 for 8-Hour and 35.0 for 1-hour.
Source: LSA Associates, Inc., 2012.

Mitigation Measure AQ-3: The same mitigations as described in Mitigation Measure AQ-2 would be applicable here.

Significance After Mitigation: Similar to impact AQ-2, there is no mitigation available with currently feasible technology to reduce the cumulative regional air quality impact to a less-than-significant level. Therefore, the impacts would remain *significant and unavoidable*.

4. Exposes Sensitive Receptors to Substantial Pollutant Concentrations

The Specific Plan is located in an area currently used for agriculture and is not located near any high volume roadways or other sources of toxic air contam-

inants. The Yolo-Solano Handbook identifies screening distances for the siting of new sensitive receptors, consistent with the CARB guidelines as previously discussed. The project would not have located sensitive uses within the following distances:

- Within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day;
- Within 1,000 feet of a major service and maintenance rail yard;
- Immediately downwind of ports (in the most heavily impacted zones) and petroleum refineries;
- Within 300 feet of any dry cleaning operation (for operations with two or more machines, provide 500 feet); or
- Within 300 feet of a large gas station (defined as a facility with a throughput of 3.6 million gallons per year or greater).

The roadways in the project area with the highest volumes are Elmira Road which carries 22,800 vehicles per day and Leisure Town Road which carries 17,500 vehicles per day.[5,6] This level of traffic is well below the ARB's recommendations. The nearest residential uses proposed as part of the specific plan are located more than 1,500 feet from the Union Pacific rail line. The closest railyards however are located in Richmond (35 miles away) and Roseville (45 miles away). There are no ports, refineries, dry cleaning operations or large gas stations located in the vicinity of the Specific Plan. Therefore, the potential to expose sensitive receptors or the general public to substantial levels of TACs and would be deemed to have a *less-than-significant* impact.

[5] Pratyush, Bhatia. Senior Engineer, Kittleson & Associates, Inc. Personal email communication with Joanna Jansen, The Planning Center | DC&E, May 29, 2012.

[6] Under cumulative conditions, Elmira would carry 31,020 vehicles per day and Leisure Town Road would carry 26,850 vehicles per day. Therefore, future residents would also not be exposed to substantial pollutant concentrations as roadways in the future would remain well below 50,000 vehicles.

5. Creates Objectionable Odors Affecting a Substantial Number of People

During construction associated with buildout of the Specific Plan, various diesel-powered vehicles and equipment in use within the Specific Plan area, would create localized odors. These odors would be temporary and are not likely to be noticeable for extended periods of time beyond the vicinity of the Specific Plan area. Once constructed, the proposed residential uses would not be expected to generate odors.

According to the YSAQMD odor complaint records, there have been no odor complaints in the vicinity of the Specific Plan within the last three years. Historically, complaints from the town of Elmira located approximately 1 mile east of the project site had been filed with YSAQMD regarding odors from the Easterly WWTP. The City has recently made upgrades to the Easterly WWTP, including measures to reduce odor generation through both on-site and off-site improvements, resulting in an overall net decrease in odor emissions at the Easterly WWTP.[7] Therefore, this facility is not expected to be a significant source of odors. There are no other known odor sources in the vicinity of the Specific Plan that would affect sensitive receptors. Therefore, the project would not generate odor impacts and would also not be expected to expose people to objectionable odors. This impact would be considered a *less-than-significant impact*.

E. Cumulative Impacts

As shown in Table 4.3-9 an analysis of localized CO impacts at study area intersections under cumulative conditions indicates implementation of the Specific Plan would not result in significant localized CO concentrations. Additionally, as discussed above, the buildout of the Specific Plan would individually exceed the significance criteria established by the YSAQMD for ROG, NOx, and PM_{10} for project operation, therefore, these impacts would also be considered cumulatively significant. Mitigation would be required to

[7] AES, January 2010, *Easterly WWTP Tertiary Project Draft EIR*.

reduce this impact, however as discussed above, even with implementation of all feasible mitigation measures, buildout of the Specific Plan would result in emissions that cannot be reduced to a less-than-significant level. Therefore, the proposed project would have a *significant and unavoidable* cumulative air quality impact related to regional air pollutants.

Impact AQ-CUM-1: See Impact AQ-2.

Mitigation AQ-CUM-1: See Mitigation Measure AQ-2.

Significance After Mitigation: Available mitigation could not reduce the impact to sufficiently low levels and it would remain *significant and unavoidable.*

F. Cumulative Impacts with PLUA

The City of Vacaville is currently updating its General Plan including the Land Use Element and the Conservation Element which includes policies for related to air quality. Should the City adopt its Preferred Land Use Alterative, cumulative impacts related to the proposed Specific Plan would remain unchanged.

4.4 BIOLOGICAL RESOURCES

This section evaluates potential impacts on the existing biological resources including vegetation and wildlife found within the Specific Plan area.

A. Regulatory Framework

1. Federal Laws and Regulations

This section summarizes federal laws and regulations that apply to biological resources in Vacaville.

a. Section 404 of the Clean Water Act

The U.S. Army Corps Engineers (Corps) is responsible under Section 404 of the Clean Water Act to regulate the discharge of fill material into waters of the United States. Waters of the United States and their lateral limits are defined in Part 328.3(a) of Title 33 of the Code of Federal Regulations (CFR) and include streams that are tributaries to navigable waters and adjacent wetlands. The lateral limits of jurisdiction for a non-tidal stream are measured at the line of the Ordinary High Water Mark (OHWM)[1] or the limit of adjacent wetlands.[2] Any permanent extension of the limits of an existing water of the United States, whether natural or human-made, results in a similar extension of Corps jurisdiction.[3]

Waters of the United States fall into two broad categories: wetlands and other waters. Other waters include water bodies and water courses such as rivers, streams, lakes, springs, ponds, coastal waters, and estuaries. Wetlands include marshes, wet meadows, seep areas, floodplains, basins, and other areas experiencing extended seasonal soil saturation. Seasonally- or intermittently-inundated features, such as seasonal pools, ephemeral streams, and tidal marshes, are categorized as wetlands if they have hydric soils and are dominated by wetland plants. Seasonally inundated water bodies or watercourses

[1] 33 CFR Part 328.3(e).

[2] 33 CFR Part 328.3(b).

[3] 33 CFR Part 328.5.

that do not exhibit wetland characteristics are classified as other waters of the United States.

Waters and wetlands that cannot trace a continuous hydrological connection to a navigable water of the United States are not considered tributaries to waters of the United States. These are termed "isolated wetlands." Isolated wetlands are jurisdictional when their destruction or degradation can affect interstate or foreign commerce.[4] The Corps may or may not take jurisdiction over isolated wetlands depending on the circumstances.

In addition, there are certain exemptions for normal agricultural activities under the 404 regulations. These exemptions include:

- The construction of farm roads (Sec. 1344(f)(1)(E)).
- The construction of farm or stock ponds, irrigation ditches, and minor agricultural drainages (Sec. 1344(f)(1)(A)).
- The maintenance of drainage ditches (Section 1344(f)(1)(C)).

In general, a Corps permit must be obtained before an individual project in Vacaville can place fill or grade in wetlands or other waters of the United States, and mitigation for such actions will be required based on the conditions of the Corps permit. The Corps will be required to consult with the U.S. Fish and Wildlife Service (USFWS) and/or the National Marine Fisheries Service (NMFS) under Section 7 of the Endangered Species Act (described in Section B.1.c) if the action being permitted under the Clean Water Act could affect federally listed species.

b. Section 401 Water Quality Certification

Pursuant to Section 401 of the Clean Water Act, projects that require a Corps permit for discharge of dredge or fill material must obtain a water quality certification or waiver that confirms the project complies with State water quality standards, or a no-action determination, before the Corps permit is

[4] 33 CFR Part 328.3(a).

valid. State water quality is regulated and administered by the State Water Resources Control Board and its nine Regional Water Quality Control Boards (RWQCBs). Vacaville is mainly within the jurisdiction of the Sacramento RWQCB. In order for the applicable RWQCB to issue a 401 certification, a project must demonstrate compliance with CEQA (e.g. negative declaration, EIR, notice of exemption).

c. Endangered Species Act

USFWS has jurisdiction over terrestrial and non-anadromous aquatic plant and animals species listed as threatened or endangered under the federal Endangered Species Act (ESA). In addition, NMFS has jurisdiction over marine and anadromous fish species listed under the ESA. The ESA protects listed animal species from "take," which is broadly defined as to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in such conduct." The term "harm" is further defined by USFWS to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. The term "harass" is further defined by USFWS as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns, which include, but are not limited to, breeding, feeding, or sheltering.[5] An activity can be defined as a "take" even if it is unintentional or accidental. Plants are legally protected under the ESA if take occurs on federal land or from federal actions, such as issuing a wetland fill permit. Any activity in Vacaville that could result in take of a federally listed species would require an incidental take authorization. Project's with a federal nexus such as federal funding or those that require a permit from a federal agency such as the Corps may obtain take authorization through the ESA Section 7 consultation process. Projects lacking a federal nexus must obtain permits through an ESA Section 10(a)(1)(B) permit.

[5] 50 CFR Section 17.3.

An endangered species is one that is considered in danger of becoming extinct throughout all, or a significant portion, of its range. A threatened species is one that is likely to become endangered in the foreseeable future. USFWS also maintains a list of species proposed for listing as threatened or endangered. Proposed species are those for which a proposed rule to list as endangered or threatened has been published in the *Federal Register*.

The protection of listed species under the federal ESA from take extends to "development projects" in Vacaville as well as an individual's actions in Vacaville.

d. Migratory Bird Treaty Act

USFWS is responsible for enforcing the Migratory Bird Treaty Act (MBTA),[6] which prohibits the taking, hunting, killing, selling, purchasing, etc. of migratory birds, parts of migratory birds, or their eggs and nests. In addition, it contains a clause that prohibits baiting or poisoning these birds. As used in this Act, the term "take" is defined as "to pursue, hunt, shoot, capture, collect, kill, or attempt to pursue, hunt, shoot, capture, collect, or kill, unless the context otherwise requires." The MBTA has traditionally been seen as imposing strict liability on activities resulting in the "take" of migratory birds, regardless of whether there was any intent to take the birds. However, recent case law in several areas has determined that the MBTA was not intended to impose criminal liability on the acts or omissions of persons involved in lawful commercial activities such as agriculture or land clearing for development, which may indirectly cause the death of birds protected under the MBTA. Most of the native bird species that occur in and around Vacaville are covered by this Act. As with the federal ESA, the MTBA is a broad regulation aimed at protecting migratory bird species; however, unlike the ESA, the MBTA implementing regulations do not have a permit system that allows for taking of most migratory birds.

[6] United States Code, Title 16, Chapter 7, Subchapter II.

2. State Laws and Regulations

This section summarizes State laws and regulations that apply to biological resources in Vacaville.

a. Porter-Cologne Water Quality Act

The State and RWQCB also maintain independent regulatory authority over the placement of waste, including fill, into waters of the State under the Porter-Cologne Act. The RWQCB currently employs the Corps procedures and definitions for defining the physical boundaries of wetlands and waters; however, there are differences in the State and federal ability to regulate these features. In order to be subject to federal regulation as waters of the United States, wetlands and waters must demonstrate that water is, or is adjacent to, a navigable waterway or a tributary to a navigable waterway, or have an interstate or foreign commerce connection. Under the Porter-Cologne Act, the State, in addition to waters of the United States, has regulatory authority over what are termed “isolated” waters and wetlands. There are other important differences between the State and federal regulations. First, State regulations do not have a similar agricultural exemption to the 404 regulations. In addition, the State may choose to impose or require different mitigation requirements than may be required by the Corps.

Should the RWQCB decide not to issue a 401 certification or waiver for a project or if there are isolated wetlands, the RWQCB would regulate the fill of waters of the State under this Act. As with the 401 certification discussed in Section B.1.b, the applicable RWQCB must demonstrate compliance with CEQA (e.g., negative declaration, EIR, notice of exemption) before issuing a permit.

b. California Endangered Species Act

Section 2080 of the Fish and Game Code prohibits the "take" of any species that the California State Fish and Game Commission determines to be an endangered species or a threatened species. “Take” is defined in Section 86 of the Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill."

The State and federal lists of threatened and endangered species are generally similar; however, a species present on one list may be absent from the other. California Endangered Species Act (CESA) regulations are also somewhat different from the federal ESA in that the State regulations include threatened and endangered plants on non-federal lands within the definition of "take."

CESA allows for take incidental to otherwise lawful development projects. CESA emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate mitigation planning to fully offset project-caused losses of listed species populations and their essential habitats.

Through permits or memorandums of understanding, CDFG may authorize individuals, public agencies, universities, zoological gardens, and scientific or educational institutions to import, export, take, or possess any endangered species, threatened species, or candidate species of plants and animals for scientific, educational, or management purposes.

CDFG also maintains lists of Species of Special Concern, which include plants and animals that may have shown population declines or restricted distribution within the state, and/or are associated with habitats that are declining in California. These species, along with other special interest species, are inventoried in the CNDDB. Impacts on special-status plants and animals may be considered significant under Section 15380 of CEQA, depending on the particular circumstances.

As with the federal ESA, CESA provides broad protection for listed species from take. This protection extends to "development projects" in Vacaville as well as an individual's actions.

c. California Fish and Game Code Section 1600

CDFG also administers the issuance of Streambed Alteration Agreements under Fish and Game Code Section 1600. Streambed Alteration Agreements are required for any project activities in Vacaville that would substantially

divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake designated as such by CDFG. Similar to the water quality regulations administered by the RWQCB, a project must demonstrate compliance with CEQA before a permit may be issued.

d. California Fish and Game Code 3503 and 3503.5

Section 3503 of the Fish and Game Code makes it unlawful to take, possess, or needlessly destroy the nests or eggs of any bird. Section 3503.5 makes it unlawful to take or possess birds of prey (e.g. hawks, eagles, vultures, and owls), or destroy their nests or eggs. These regulations, in combination with the requirements under the federal MBTA, provide the regulatory basis requiring nest avoidance measures for species such as the burrowing owl and Swainson's hawk in Vacaville.

e. Oak Woodlands Conservation Act

The California Oak Woodlands Conservation Act[7] acknowledges the importance of private land stewardship to the conservation of the state's valued oak woodlands. The Act establishes the California Oak Woodlands Conservation Program, which aims to conserve oak woodlands existing in the state's working landscapes by providing education and incentives to private landowners. The program provides technical and financial incentives to private landowners to protect and promote biologically functional oak woodlands.

f. California Native Plant Society

CNPS, in conjunction with CDFG, other agency staff, consultants, academic botanists, and other nongovernmental conservation organizations, has developed lists of plants of special concern in California. The name of this list recently changed from CNPS List to the California Rare Plant Rank (RPR). A RPR List 1A plant is a species, subspecies, or variety that is considered extinct. A List 1B plant is considered rare, threatened, or endangered in California and elsewhere. A List 2 plant is considered rare, threatened, or endangered in California, but is more common elsewhere. A List 3 plant is a spe-

[7] California Fish and Game Code Section 1360 et seq.

cies for which the RPR lacks necessary information to determine whether it should be assigned to a list. A List 4 plant has a limited distribution in California.

All of the plant species on List 1 and List 2 are generally considered to meet the requirements of Section 1901, Chapter 10 (Native Plant Protection Act) or Sections 2062 and 2067 (CESA) of the California Fish and Game Code for State listing. Therefore, plants appearing on List 1 or List 2 are typically considered to meet the criteria of CEQA Section 15380 and impacts on these species are considered "significant" under CEQA.

3. Local Regulations and Policies

This section summarizes local regulations and policies that apply to biological resources in Vacaville.

a. Solano Multi-Species Habitat Conservation Plan

The U.S. Bureau of Reclamation, the Solano County Water Agency (SCWA), and its eight Member Agency contracts, including the City of Vacaville, the City of Fairfield, Suisun City, the City of Vallejo, the Solano Irrigation District (SID), and the Maine Prairie Water District (MPWD) have agreed to implement conservation measures to ensure the protection of threatened and endangered species and their habitat within the SCWA contract service area. Full implementation of the conservation measures outlined in the Solano Project Water Service Contract Renewal Biological Opinion is key to the survival and recovery of listed species. As such, SCWA and the member agencies are developing the Solano Multi-Species HCP for the Solano Project contract service area. The Solano Multi-Species HCP is intended to support the issuance of a Section 10(a)1(B) "incidental take permit" under the ESA for activities associated with future water use in the Solano Project contract service area. The Plan participants also intend to secure incidental take authorization from CDFG for State-listed species.[8]

[8] Fish and Game Code Section 2080.1.

The Solano HCP proposes to secure incidental take authorization for 37 species. The scope of the HCP includes take coverage for federally listed fish species under the jurisdiction of NMFS and species listed as threatened or endangered under CESA. The HCP further addresses other species of concern, that is, species recognized by groups such as CDFG and CNPS (or RPR) as having declining or vulnerable populations, but not officially listed as threatened or endangered species.

Once the applicable state and federal incidental take permits are issued, the Plan Participants will assume primary responsibility for extending incidental take coverage for their own activities, extending coverage to third parties over which the Plan Participants have direct regulatory control (e.g., through issuance of grading permits, occupancy permits, use permits, etc.), and ensuring compliance with required avoidance, minimization, and mitigation measures. The HCP effectively shifts endangered species regulations compliance from a federal and state level to the local level under the authority of a well-regulated, regional plan.

An additional 35 species are addressed in the Conservation Strategy as "Special Management Species." Special Management Species include species that were initially considered for inclusion in the HCP as Covered Species and are considered under CEQA Criteria 15380 to be threatened or endangered. However, the life history and/or habitat associations for such species may not be fully known. While these species will benefit from the broader community conservation provided for other Covered Species, sufficient information on their biology and management is not available to allow the federal agencies to make the necessary findings under the "No Surprises" assurances[9] that the

[9] The purpose of the No Surprises Rule (50 CFR 17.21(b)(5)-(6) and 17.22(b)(5)-(6); 63 F.R. 8859) is to provide assurances to nonfederal landowners participating in habitat conservation planning under the ESA that no additional land restrictions or financial compensation will be required for species adequately covered by a properly implemented HCP, in light of unforeseen circumstances, without the consent of the Permittee(s).

proposed Conservation Program and Covered Activities will not appreciably reduce the likelihood of survival and recovery of the species in the wild.

The Solano HCP is at the final administrative draft stage and a Public Draft is scheduled for release for public review in the summer of 2012. Once adopted, take permitting authority for covered species would be largely transferred from the Federal and State levels to the local plan participants such as the City of Vacaville.

b. Jepson Parkway EIR/EIS

The approved Jepson Parkway project proposes widening Leisure Town Road along the western boundary of the Specific Plan area and relocating it slightly eastward. The potential environmental impacts of the Jepson Parkway project, including impacts to Old Alamo Creek, have been evaluated in the *Jepson Parkway EIR/EIS*, certified by the Solano Transportation Authority (STA) in May 2011. The mitigation measures in this EIR/EIS would therefore regulate future activity related to the Jepson Parkway project in the Specific Plan vicinity. The analysis in this section tiers off of the analysis of biological impacts in the *Jepson Parkway EIR/EIS*, as authorized by CEQA Guideline section 15152. The *Jepson Parkway EIR/EIS* is available for public review at the City of Vacaville Community Development Department.

The *Jepson Parkway EIR/EIS* considered a "no-build alternative" that analyzed the effects of not constructing the roadway improvements (Alternative A) as well as four "build alternatives" that analyzed various possible alignments (Alternatives B, C, D and E). Of the four build alternatives, Alternatives B, C, and D all follow Leisure Town Road adjacent to the Brighton Landing Specific Plan area, and all four called for a four-lane road with a median in this segment (Segment 4).

Impact BR-1 in the *Jepson Parkway EIR/EIS* identified impacts resulting from culverting Old Alamo Creek and removing associated riparian woodlands. This impact is addressed through two mitigation measures. Mitigation Measure BR-1 calls for construction-period mitigation, such as temporary fencing,

to minimize disturbance of sensitive natural communities. Mitigation Measure BR-2 states that STA or the local agency will compensate for impacts to riparian communities at a minimum 2:1 ratio (2 acres restored or created for every 1 acre affected). "Compensation may be a combination of on-site or off-site restoration/creation (i.e. restore riparian in areas disturbed by construction where possible, or at an agency-approved off-site mitigation area), contribution of funds to CDFG for restoration activities on public lands, and mitigation credits." The EIS/EIR notes that ultimate requirements will be mandated through other required State and federal permits.[10]

Impact BR-3 in the Jepson Parkway EIR/EIS addresses loss of trees protected by Section 14.09.131 of the Vacaville Land Use and Development Code (Tree Protection Ordinance), described in section A.3.d, below. The EIR/EIS identifies non-native landscape trees and up to 19 native oak trees along Leisure Town Road that would be removed, including approximately 13 interior live oak and valley oak trees within riparian and landscaped/developed areas on Leisure Town Road at Old Alamo Creek, and one valley oak about 2,625 feet south of the creek crossing. However, these trees are not mapped or identified individually, so it is not clear how many are within the Brighton Landing Specific Plan area, nor is it clear how many qualify for protection under Vacaville's ordinance. Mitigation Measure BR-3 calls for planting new native trees in rural landscaping areas in order to mitigate the loss of existing trees, and for monitoring new trees to ensure a minimum 80 percent survival rate.

Impact BR-16 in the Jepson Parkway EIR/EIS concluded that there is suitable aquatic habitat for western pond turtles at the Old Alamo Creek crossing, and that while suitable upland habitat is limited because of development in the area, western pond turtles do occur in the study area and would be adversely effected by the Jepson Parkway project. Impact BR-22 identified cumulative impacts to western pond turtle. This impact would be addressed by the following mitigation measures from the Jepson Parkway EIR:

[10] Solano Transportation Authority, 2011. *Jepson Parkway Project Draft Environmental Impact Report/Environmental Impact Statement*, page 3.15-10.

- BR-10: Conduct a biological-resources education program for construction crews and enforce construction restrictions.
- BR-11: Retain a biologist to monitor construction activities.
- BR-12: Install construction barrier fencing around the construction area.
- BR-16: Conduct Preconstruction Surveys.

Impact BR-26 in the Jepson Parkway EIR/EIS identified impacts to five elderberry shrubs along Old Alamo Creek that are habitat for Valley elderberry longhorn beetle. This impact is addressed through Mitigation Measure BR-24, which includes detailed measures for transplanting elderberry shrubs to conservation areas.[11]

c. Vacaville General Plan

The City of Vacaville's current General Plan contains guiding and implementing policies that are relevant to biological resources in the study area. Many of these guiding and implementing policies occur in the Conservation Element. Table 4.4-1 presents policies from the 1990 General Plan that are relevant to biological resources.

d. Vacaville Land Use and Development Code

Sections of the code applicable to the Brighton Landing Specific Plan include:

- Section 14.09.131 of the Vacaville Land Use and Development Code, which sets forth criteria for the preservation of native species, healthy trees, large specimens, and visually prominent trees. Impacts to any tree greater than 31 inches in circumference at 4.5 feet above the ground surface require a City permit; and
- Section 14.12.174.050 of the Land Use and Development Code, which sets forth criteria for the designation of development setbacks for creeks, with a minimum setback standard of 40 feet from the top of the stable bank, as determined by the City Engineer.

[11] Solano Transportation Authority, 2011. *Jepson Parkway Project Draft Environmental Impact Report/Environmental Impact Statement*, pages 3.15-55, 3.15-58.

TABLE 4.4-1 **1990 GENERAL PLAN POLICIES RELEVANT TO BIOLOGICAL RESOURCES**

Policy Number	Policy
Land Use Element	
Policy 2.1 – G3	Establish open space linkages by preserving habitat areas, including natural creek corridors. Use utility easements where possible as open space linkages.
Policy 2.1 – G10	Protect the natural environment that the City enjoys and use creeks, hills, utility corridors, viable agricultural lands or other significant natural features wherever appropriate to establish ultimate City boundaries.
Policy 2.1 – I5	Implement adopted resource protection regulations that establish standards for designated agriculture and hillside agriculture areas and public open space for protection of major ridgelines, creek and riparian corridors, wetlands, and hillsides. Standards for open space management and grading also shall be established.
Open Space Element	
Policy 3.5 – G3	Preserve natural creek corridors of significance to the City.
Policy 3.5 – G4	Maintain natural woodlands.
Policy 3.5 – I5	Where possible, minimize cut-and-fill activities and disturbance of natural habitats and vegetation. At the minimum, revegetation of cut-and-fill on slopes should be required.
Policy 3.5 – I6	Reserve stream-channel setbacks necessary for flood control, preservation of existing habitat and vegetation, multipurpose paths or trails, and maintenance access needs.
Parks and Recreation Element	
Policy 4.6 – I8	Preserve and enhance available riparian corridors, wildlife habitat, oak woodland, and other biotic resources within parks.
Conservation Element	
Policy 8.1-G1	Preserve and enhance Vacaville's creeks for their value in providing visual amenity, drainage, and wildlife habitat.
Policy 8.2- G2	Manage open space in a manner consistent with wildlife protection.
Policy 8.2 – I1	Require preservation or, where preservation is not possible, replacement of riparian vegetation.

TABLE 4.4-1 **1990 GENERAL PLAN POLICIES RELEVANT TO BIOLOGICAL RESOURCES** (CONTINUED)

Policy Number	Policy
Policy 8.2 – I2	Minimize removal of woodland habitat.
Policy 8.2 – I3	Provide wildlife corridors, where feasible, to enable free movement of animals and minimize wildlife-urban conflicts.
Policy 8.2 – I4	Continue to implement the City's existing regulations which protect mature trees and existing natural non-agricultural trees.

Source: City of Vacaville, *Vacaville General Plan*, 1990.

- Section 14.09.101 of the Land Use and Development Code, which establishes development standards for the Open Space (OS) designation. The OS designation provides for the preservation of public open space lands such as hillsides, ridgelines, and scenic areas. The OS designation also includes areas with limited development potential due to the physical characteristics of the land or inaccessibility. The purposes of the OS regulations are to: promote the preservation of public open space lands in order to protect natural resources, wildlife habitat, ridgelines, and areas of scenic beauty and cultural significance; provide for continued agricultural uses; provide for low intensity outdoor recreational uses in natural environments; protect the public health and safety by limiting the use of lands that are subject to fire, landslide, or seismic hazards; and implement the goals, objectives, and policies of the Zoning Land Use and Development Code and the General Plan.

B. Existing Conditions

The following sections are based on analysis and field work by LSA Associates. The Brighton Landing Specific Plan area was surveyed on June 15, 2011 and July 21, 2011. During the field visit, the site was examined for the occurrence of plant and animal habitat and for animals. Fieldwork consisting of observational surveys from fixed locations and walking surveys of more densely vegetated areas focused on examining the agricultural fields for forag-

ing bird species, examining trees for nesting Swainson's hawks and other bird species, searching for habitat of burrowing owls and other special-status animals, examining roadside areas for habitat of special-status plants, and for the occurrence of wetlands. Drainage canals and Old Alamo Creek were also examined for the occurrence of habitat. Aerial photographs of the Specific Plan area were examined for 2006 and 2009 prior to conducting the fieldwork.

1. Plant Community Descriptions

This section provides a description of the plant communities and other cover types and wildlife habitat that occurs within the Brighton Landing Specific Plan area and on the site of the adjacent detention basin, as shown in Figure 4.4-1. In addition, Table 4.4-2 provides the total area of each community/habitat type. These plant communities consist of riparian vegetation, cultivated agriculture, wetland, and developed areas. In addition, this section addresses the special-status species that occur in the Vacaville area and could potentially occur in the Specific Plan area.

a. Old Alamo Creek

A branch of Old Alamo Creek flows through the northwestern corner of the Brighton Landing Specific Plan area. The banks slope steeply down to the bed of the creek, which is approximately 15 to 20 feet wide. The banks are approximately 15 feet high. The creek consists of small pools with silty or sandy bottoms and rapids with gravel bottoms. The creek appears perennial in this location. The banks support riparian shrubs and trees that form a multi-layered canopy consisting of tall valley oaks (*Quercus lobata*) in the upper canopy layer, shorter trees in the mid canopy, and shrubs in the lower canopy.

i. Riparian Woodland

The riparian vegetation along Old Alamo Creek consists of valley oak, Fremont cottonwood (*Populus fremontii*), red willow (*Salix laevigata*), sand bar willow (*Salix exigua*), California buckeye (*Aesculus californica*), and blue

Source: DC&E (2011); LSA (2011); Aerial Imagery from Solano County (2009).

FIGURE 4.4-1

COVER TYPES

TABLE 4.4-2 **VEGETATION/COMMUNITY COVER TYPES IN THE BRIGHTON LANDING SPECIFIC PLAN AREA**

Vegetation/Community Type	Acreage
Riparian	0.34
Agriculture*	228.59
Developed	6.71
Total	235.64

* includes 0.04 acre isolated seasonal wetland and 0.09 acre of regulated drainage ditches within the Specific Plan boundary.

elderberry (*Sambucus mexicana*). The valley oaks attain a height of approximately 40 feet and form an open canopy over shorter trees consisting of blue elderberry, California buckeye, red willow, and sandbar willow. Beneath the canopy of the shorter trees are patches of wild rose (*Rosa californica*), Himalyan blackberry (*Rubus discolor*), creeping wildrye (*Leymus triticoides*), and other herbaceous species.

ii. Perennial Marsh

Marsh vegetation of the banks of Old Alamo Creek consists of cattails (*Typha* sp.), dallisgrass (*Paspalum dilatatum*), barnyard grass (*Echinochloa* spp.) cupgrass (*Eriochloa* spp.), rabbit's foot grass (*Polypogon monspeliense*), cocklebur (*Xantium strumarium*), knotweed (*Polygonum* spp.), and hairy willowherb (*Epilobium ciliatum*). Many of these are common weedy species that occur in disturbed areas and do not indicate high quality habitat.

b. Developed

The Developed cover type occurs in the northwestern corner of the Brighton Landing Specific Plan area, beside the riparian vegetation. Vegetation consists of overstory ornamental trees including coast redwood (*Sequoia sempervirens*), ornamental species of pine (*Pinus* spp.), and other trees. The understory consists of areas bare of vegetation due to constant human disturbance, ornamen-

tal shrubs and lawn, and non-native grassland. The non-native grassland consists of introduced species of grasses and forbs and occurs as a mosaic with the overstory trees and disturbed areas.

Non-native grassland is a component of the understory of the Developed cover type. Common non-native grassland species include the following species of grass: wild oats (*Avena fatua, A. barbata*), ripgut brome (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), hare barley (*Hordeum murinum* ssp. *leporinum*), and Italian ryegrass (*Lolium perenne*). Non-native species of forbs that commonly occur in the non-native grassland and in ruderal vegetation include: filarees (*Erodium* spp.), mustards (*Brassica rapa, B. niger, Hirschfeldia incana*), wild radish (*Raphanus sativus*), mallows (*Malva* spp.), vetches (*Vicia* spp.), starthistles (*Centaurea* spp.), and others. Areas with significant ground disturbance tend to be dominated by tall, broad-leaved species such as mustards, wild radish, mallow, and star thistles, and are often referred to as ruderal vegetation or disturbed communities.

While non-native plants typically dominate non-native grassland, a few native species may occur with the non-native plants. Common natives remaining in this community include small-flowered lupine (*Lupinus bicolor*), fiddleneck (*Amsinckia* spp.), and California poppy (*Eschscholzia californica*).

c. Agricultural Fields

Agricultural areas are an important resource for several sensitive, threatened, and endangered species. The value of agricultural lands to wildlife depends on the vegetation characteristics, cultivation practices, and flooding regimes of particular areas.

i. Crops

Croplands are typically established in flat terrain on fertile soils and are greatly manipulated in terms of soil tillage, irrigation, crop rotation, and fertilization. Cropland vegetation is usually grown in a monoculture, using tillage or herbicides to eliminate unwanted vegetation. Cultivated species in such fields exhibit a variety of sizes and growing patterns that provide various heights

and canopy covers. Following harvest, many fields are left fallow until the next planting season.

Agricultural habitats are regularly disturbed by preparation for planting, planting, cultivating, use of pesticides, and harvesting. Such areas are characterized by low cover throughout much of the year and low species diversity. Prior to planting, the fields are bare of vegetation. The cover increases from low to high as the crops grow. The cover of fallow fields also increases over time as propagules (e.g. seeds and buds) continue to colonize the field. Ditches may be bare or support wetland, non-native grassland, and ruderal vegetation. Non-native grassland and ruderal vegetation may also occur beside the fields in areas that are not maintained frequently.

The crops of the Brighton Landing area consisted of corn and alfalfa during the 2011 survey. Crops in past years from 2007 to the present have included corn, wheat and sunflowers. Wheat or barley was also grown in the vicinity of Brighton Landing in 2011. Corn and other grain are annual crops and are planted yearly. Alfalfa is a perennial crop that is typically grown for 3 to 5 years and, in this region, is typically harvested several times per growing season.

ii. Ditches

Ditches occur beside Elmira Road and beside some of the agricultural fields. The ditches beside Elmira Road are earth-lined and support a ruderal assemblage of wetland and upland plant species. Wetland species that occur in the ditches are waterpepper (*Polygonum hydropiperioides*), barnyard grass (*Echinochloa crus-galli*), sprangletop (*Leptochloa fascicularis*), umbrella sedge (*Cyperus eragrostis*), Bermuda grass (*Cynodon dactylon*), rabbits foot grass (*Polypogon monspeliense*), curly dock (*Rumex crispus*), and Italian ryegrass (*Lolium perenne*). The species that characterize fallow fields occur on the upper bank and beside the ditches. The 0.09-acre of the ditches along Elmira Road within

the Specific Plan boundary are subject to Clean Water Act Section 404 regulation.[12]

Additional irrigation ditches within the agricultural fields are approximately 2 feet wide. Because these ditches do not discharge to any off-site areas, including Alamo Creek, these features are not regulated by the Corps. These irrigation ditches were largely maintained free of vegetation, although seasonal hydrophytic species would occasionally colonize the ditches. As a result of agricultural activities, these ditches would often be filled in and replaced in different configurations. The ditches shown on Figure 4.4-1 represent the conditions existing in 2011.

iii. Seasonal Wetlands

Small patches of wetland vegetation occur throughout the agricultural areas where water drips from pumps, leaks from irrigation ditches, or occurs in depressions created as a result of agricultural activities. Species that occur in the seasonal wetlands are generally common species that are easily dispersed and occur in areas of high disturbance. These species include barnyard grass, sprangletop, cocklebur, waterpepper, yellow bristle-grass (*Seteria pumila*), and dallisgrass (*Paspalum dilatatum*). According to Jones and Stokes (2006) the seasonal wetland is 0.04 acre.[13] The current extent of seasonal wetlands on the site appears to be similar to the 2006 conditions. In October 2011 the Corps re-verified the formal jurisdictional determination based on the 2006 delineation.[14]

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[12] Jones and Stokes, 2006. *Preliminary Delineation of Waters of the United States, including wetlands for the Brighton Landing Project, Solano County California*, prepared for Reynen and Bardis Communities.

[13] Jones and Stokes, 2006. *Preliminary Delineation of Waters of the United States, including wetlands for the Brighton Landing Project, Solano County California*, prepared for Reynen and Bardis Communities.

[14] US Army Corps of Engineers, Sacramento District, 2011. Jurisdictional Determination letter to Mr. Robert Holmes, Sares Regis Group of Northern California, from Marc A. Fugler, Senior Project Manager California Delta Branch. October 14, 2011. Corps Reference No. SPK 2006-00879.

iv. Trees

An occasional large tree or small group of large trees occurs along the roads that are adjacent to the Specific Plan area and as landscape plants in the developed area. These trees range from 1 to 3 feet in diameter and are 30 feet or taller. Valley oak is the most common large tree although Fremont cottonwood also occurs along the roads.

2. Fish and Wildlife

Vacaville is located at the intersection of two major geographical provinces: the Coast Range and the alluvial fans, terraces, and basins on the valley floor. As a result, there is a high diversity of wildlife that occurs in the general vicinity of the Specific Plan area. Nevertheless, the highly disturbed nature of agricultural areas, the narrow riparian corridor, and isolated large trees reduces the value of this habitat for wildlife.

a. Agricultural Areas

Agricultural areas with their regular disturbance, low cover, and low species diversity do not provide valuable habitat for wildlife. California ground squirrel (*Otospermophilus beecheyi*) commonly occurs in agricultural areas where they colonize berms, banks of ditches and other areas of low cover. Besides ground squirrels, mammals would be largely absent or moving through the agricultural fields on their way to other habitat. A few bird species regularly use agricultural fields. Swallows, western kingbirds (*Tyrannis verticalis*), and black phoebes (*Sayornis nigricans*) would be expected to forage above agricultural fields for insects. Brewer's (*Euphagus cyanocephalus*), redwinged (*Ageliaeus phoeniceus*), and tricolor blackbirds (*Ageliaeus tricolor*) and European starlings are often observed in agricultural areas feeding on grain after harvest or insects. American crows (*Corvus brachyrhynchos*) also forge in agricultural fields for insect larvae after tilling. Northern mockingbird (*Mimus polyglottos*) would be expected in agricultural fields near residential areas.

The diversity of reptile and amphibian species in the agricultural areas is expected to be low because of the absence of cover and the near continual disturbance. Sierran treefrog (*Pseudacris sierra*), a species known to disperse wide-

ly, would be expected to breed in some of the waterbodies that occur in agricultural areas. Western fence lizard (*Sceloperus occidentalis*) would also be expected in areas of low cover of vegetation but with other cover to allow for escape from predators.

b. Riparian Area

The structural complexity of the riparian area along Old Alamo Creek, including the tree, shrub, and marsh species supports relatively high biological diversity although this diversity has been reduced by the narrow width of the corridor and the adjacent agricultural fields.

Riparian habitats provide cover for the movement of wildlife from one area to another. Such habitat in the Specific Plan area only occurs in the northwestern corner although this riparian area is connected to the riparian near the northeastern corner of the Specific Plan area. Mammal species are expected to forage and use the cover of riparian areas. These species are gray fox ((*Urocyon cinereoargenteus*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), and Virginia opossum (*Didelphis virginianus*).

Riparian habitat provides valuable nesting, cover, foraging, and movement habitat for wildlife, all within close proximity to water. Overall, riparian vegetation provides important habitat for over 225 species of fish, amphibians, reptiles, birds, and mammals in California. Riparian zones have been identified as the most important habitats for landbird species in California.[15] Insect production is high within the riparian corridor, providing a rich food source for insectivores such as vireos, warblers, swallows, wrens, and flycatchers. Riparian trees are highly productive, producing food resources for seed feeders such as grosbeak, finches, and sparrows. Riparian habitats are considered to be particularly valuable for neo-tropical migratory songbirds, which have declined in recent decades.

[15] Riparian Habitat Joint Venture, 2000. *The Riparian Bird Conservation Plan: A Strategy for Reversing the Decline of Riparian Associated Birds in California*, Stinson Beach, CA: California Partners in Flight, Point Reyes Bird Observatory.

Native amphibians that potentially occur within this region include the arboreal salamander (*Aneides lugubris*) and California slender salamander (*Batrachoseps attenuatus*) that occur under logs and other cover. These species forage for invertebrates. Eggs of these species would be expected in terrestrial areas such as holes, beneath logs, or in other secluded locations. Sierran tree frog and western toads (*Bufo boreas*) would also be expected to occur beneath cover in the riparian areas. Their food would be invertebrates and small vertebrates in the case of the western toad. Both Sierran treefrog and western toad would be expected to breed in Old Alamo Creek.

Reptiles that would be expected in the riparian area include southern alligator lizard (*Elgaria multicarinata*) and western fence lizard. Both would feed on invertebrates and small vertebrates in the case of the alligator lizard. Gopher snakes (*Pituophis melanoleucus*) and common kingsnake *(Lampropeltis getulus*) would also be expected to occur in the riparian area where they would feed on large invertebrates and small vertebrates.

c. Developed Area

The wildlife value of the developed area would be low because of the regular presence of humans. A variety of birds would occur on the trees of the developed area and species that occur in the adjacent riparian area would also be expected to use the non-native grassland portion of the developed area for cover and foraging.

3. Special-status Plant and Wildlife Species

Special-status plant and wildlife species are those listed under the State and federal Endangered Species Acts, plants on the California Rare Plant Rank list, and wildlife designated as Species of Special Concern by the California Department of Fish and Game. The special-status species addressed in this section are based on a review of records from the CNDDB, CNPS on-line inventory, and the Solano HCP Covered Species database in the vicinity of the study area.

There are 33 special-status plant species and 33 special-status animal species that are either known to occur, have historically occurred, or may potentially occur within the study area. Table 4.4-3 lists special-status plant species, while Table 4.4-4 lists special-status animal species. Each table is organized alphabetically by scientific name and identifies the current status of the species and the habitat types with which they are associated.

4. Sensitive Natural Communities

CDFG has identified several native plant communities that are rare and/or diminishing within California. Although some of these communities represent important biological resources and may be unique to California, they have no legal, protective status. Regardless, substantial losses of some of these plant communities may be considered "significant" under CEQA. Plant communities that are considered sensitive by CDFG in the study area are Riparian Freshwater Marsh.

5. Countywide Conservation Area

A countywide conservation analysis was conducted for the Solano HCP to identify specific conservation areas for each natural community. These conservation areas were then used to develop a conservation approach for each natural community, outline compensation or mitigation levels for covered activities, and determine the level of development compatible with the regional conservation goals and objectives. This section provides a description of each conservation area found within the Brighton Landing Specific Plan area. Because Vacaville is a participant in the HCP, these areas are applicable to the Vacaville General Plan. More detailed information concerning the methods of the conservation analysis can be found in Section 4 of the Draft Solano HCP.[16]

[16] Solano County Water Agency, 2009. *Solano Habitat Conservation Plan, Administrative Draft*, prepared by LSA Associates, Inc.

TABLE 4.4-3 **SPECIAL-STATUS PLANT SPECIES KNOWN OR SUSPECTED FROM THE VACAVILLE GENERAL PLAN STUDY AREA VICINITY**

Common Name *Scientific Name*	STATUS Federal/ State/RPR	Habitat	Likelihood of Occurrence
Ferris's milk-vetch *Astragalus tener var. ferrisiae*	–/–/1B	Vernally mesic meadows and mildly alkaline flats in valley and foothill grassland, usually on dry, heavy clay, or adobe soil. Flowers April through May.	Absent, undisturbed vernally mesic areas absent
Alkali milk-vetch *Astragalus tener. var. tener*	–/–/1B	Grows in alkaline/saline soils in vernally wet playas, flats, and valley and foothill grassland. Flowers February through June.	Absent, undisturbed vernally mesic areas absent
Heartscale *Atriplex cordulata*	–/–/1B	Grows in sandy, saline, or alkaline flats or scalds, in chenopod scrub, meadows, and valley and foothill grassland. Blooms April through October, depending on local environmental conditions.	Absent, undisturbed alkaline areas absent
Brittlescale *Atriplex depressa*	–/–/1B	Grows in relatively barren areas with alkaline clay soils within chenopod scrub, meadows, playas, vernal pools, and valley and foothill grassland. Occasionally, it is found in riparian marshes. Blooms from May through October, depending on local environmental conditions.	Absent, undisturbed alkaline areas absent
San Joaquin spearscale *Atriplex joaquiniana*	–/–/1B	Grows in seasonal alkali wetlands and alkali sinks in chenopod scrub, meadows, playas, and valley and foothill grassland, with Mediterranean *barley (Hordeum marinum* ssp, *gussoneanum*), alkali mallow (*Malvella leprosa*), and other alkali-associated plants. Blooms April through October, depending environmental conditions.	Absent, undisturbed alkaline areas absent
Vernal pool smallscale *Atriplex persistens*	–/–/1B	Grows in alkaline grasslands as well as in large and small claypan and alkaline vernal pools. Blooms July through October.	Absent, undisturbed alkaline areas absent
Big-scale balsamroot *Balsamorhiza macrolepis* var. *macrolepis*	–/–/1B	Grows in thin, rocky soil on hillsides, sometimes on serpentine, grasslands, and woodlands. Blooms March to June.	Absent, thin soils absent
Big tarplant *Blepharizonia plumosa*	–/–/1B	Grows in thin soils in grasslands. Blooms July to October.	Absent, thin soils absent
Mt. Diablo fairy-lantern *Calochortus pulchellus*	–/–/1B	Grows in openings in chaparral, coastal scrub, and associated grasslands. Blooms April to June.	Not likely, not known from cultivated areas
Holly-leaved ceanothus *Ceanothus purpureus*	–/–/1B	Grows on dry, chaparral-covered, rocky, volcanic slopes. Flowers in early to late spring.	Absent, chaparral habitat is absent

TABLE 4.4-3 **SPECIAL-STATUS PLANT SPECIES KNOWN OR SUSPECTED FROM THE VACAVILLE GENERAL PLAN STUDY AREA VICINITY** (CONTINUED)

Common Name *Scientific Name*	STATUS Federal/ State/RPR	Habitat	Likelihood of Occurrence
Pappose tarplant *Centromadia parryi* ssp. *parryi*	–/–/1B	Occurs most frequently in mesic areas in coastal prairie, meadow, and grassland habitats, often on alkaline substrates. Some disturbance appears to be necessary for its persistence.	Absent, mesic grassland absent
Hispid bird's-beak *Cordylanthus mollis* ssp. *mollis*	–/–/1B	Grows in saline or alkaline soils in vernal pools, meadows, sinks, inland playas, and valley and foothill grassland. Blooms June through September.	Absent, alkali sink areas absent
Recurved larkspur *Delphinium recurvatum*	–/–/1B	Grows in alkaline areas, in chenopod scrub, cismontane woodland, and valley and foothill grassland. Often grows in vernally moist or inundated areas. Blooms March through May.	Absent, alkaline moist habitat absent
Dwarf downingia *Downingia pusilla*	–/–/1B	Grows in vernal pools, playa pools, and on margins of vernal lakes and other mesic areas within valley and foothill grassland, both in alkaline (saline) and non-alkaline soils. Flowers March through May.	Absent, vernal pools absent
Mt. Diablo buckwheat *Eriogonum truncatum*	–/–/1B	Occurs in sandy soils of grassland, scrub, and chaparral habitats on hillsides. Blooms April through September.	Absent, not known from farmed areas
Fragrant fritillary *Fritillaria liliacea*	–/–/1B	Grows in heavy clay soils (often with a serpentine influence) in cismontane woodland, coastal prairie, coastal scrub, and valley and foothill grassland. This fritillary is one of the earliest spring flowers, blooming in February and March, occasionally into April.	Absent, not known from farmed areas
Adobe-lily *Fritillaria pluriflora*	–/–/1B	Grows in chaparral, cismontane, woodlands, and foothill grasslands, usually on clay soils and sometimes on serpentine. Blooms February through April.	Absent, not known from farmed areas
Boggs Lake hedge-hyssop *Gratiola heterosepala*	–/SE/1B	Grows on clay substrates in vernal pools, small playa-type pools, marshy areas, on the margins of reservoirs and lakes, and in human-made habitats such as borrow pits and cattle ponds. Blooms April through August.	Absent, vernal pools absent
Brewer's western flax *Hesperolinon breweri*	–/–/1B	Grows mostly on rocky, serpentine soils in chaparral, cismontane woodland, and valley and foothill grassland. Blooms May through July.	Absent, thin soils absent
Rose-mallow *Hibiscus lasiocarpus*	–/–/1B	Grows on the margins of freshwater marshes, wet riverbanks, and on low, peat islands in sloughs. Blooms from June through September.	Absent, not known from that portion of Vacaville
Carquinez goldenbush *Isocoma arguta*	–/–/1B	Grows in alkaline soils, on flats and low hills in valley and foothill grassland. Often occurs on low benches near drainages and on mounds in swale areas. Blooms August through December.	Absent, not known from farmed areas

TABLE 4.4-3 **SPECIAL-STATUS PLANT SPECIES KNOWN OR SUSPECTED FROM THE VACAVILLE GENERAL PLAN STUDY AREA VICINITY** (CONTINUED)

Common Name *Scientific Name*	STATUS Federal/ State/RPR	Habitat	Likelihood of Occurrence
Northern California black walnut *Juglans hindsii*	–/–/1B	Grows in rocky and gravelly well-drained soils, by the coast, along rivers and streams, and occasionally up to the slopes of Napa. It is found in foothill woodlands and riparian areas.	Absent, not observed during surveys
Contra Costa goldfields *Lasthenia conjugens*	FE/–/1B	Grows in vernal pools, swales, and other depressions in open grassland and woodland communities, often in alkaline soils. Blooms from March through June, depending on environmental conditions.	Absent, vernal pools absent
Legenere *Legenere limosa*	–/–/1B	Grows in the bottoms of vernal pools and other wet depressions in grassland communities. Blooms April through June.	Absent, vernal pools absent
Heckard's pepper-grass *Lepidium latipes* var. *heckardii*	–/–/1B	Grows on alkaline flats and in alkaline grasslands along the edges of vernal pools. Flowers March through May.	Absent, high alkaline areas absent
Baker's navarretia *Navarretia leucocephala* ssp. *bakeri*	–/–/1B	Grows in vernal pools and other wet depressions in cismontane woodland, lower montane coniferous forest, meadows, and valley and foothill grassland, in adobe or alkaline soils. Blooms May through July.	Absent, vernal pools absent
Colusa grass *Neostapfia colusana*	FT/SE/1B	Grows in large or deep vernal pools, in lakes and shallow playas, and in saline/alkaline adobe clay soils. Blooms May through August, depending on environmental conditions.	Absent, playa pool habitat absent
San Joaquin Valley orcutt grass *Orcuttia inaequalis*	FT/SE/1B	Grows in vernal pools or larger playa pools in clayey or sandy, generally alkaline soils. Blooms May through August, depending on environmental conditions.	Absent, playa pool habitat absent
Bearded popcorn-flower *Plagiobothrys hystriculus*	–/–/1A	Habitat is not well understood. Probably grows in vernal pools or wet sites in grasslands. Flowers in April and May.	Absent, undisturbed habitat absent
Rayless ragwort *Senecio aphanactis*	–/–/2	Grows on drying alkaline flats in chaparral, cismontane woodland, and coastal scrub communities. Blooms January through April.	Absent, alkaline areas absent
Showy Indian clover *Trifolium amoenum*	FE/–/1B	Found in a variety of habitats including low, wet swales, grasslands, and grassy hillsides. Has been observed growing on serpentine soils. Blooms from April to June.	Absent, not known from farmed areas
Saline clover *Trifolium depauperatum* var. *hydrophilum*	–/–/1B	Grows in salt marshes and in alkaline soils in moist valley and foothill grasslands and vernal pools. Flowers April through June.	Absent, saline marsh habitat absent

TABLE 4.4-3 **SPECIAL-STATUS PLANT SPECIES KNOWN OR SUSPECTED FROM THE VACAVILLE GENERAL PLAN STUDY AREA VICINITY** (CONTINUED)

Common Name *Scientific Name*	STATUS Federal/ State/RPR	Habitat	Likelihood of Occurrence
Crampton's tuctoria or Solano grass *Tuctoria mucronata*	FE/SE/1B	Found in drying, alkaline/saline clay bottoms of vernal pools, lakes, and shallow playa pools. Is associated with other vernal pool and wetland plants, including the endangered Colusa grass. Olcott lake, where the original populations were found, is a large saline-alkaline playa pool within annual grassland. Solano grass blooms April through July.	Absent, playa pool habitat absent

Status designations

Federal:

FE = Listed as "endangered" under the federal Endangered Species Act.

FT = Listed as "threatened" under the federal Endangered Species Act.

PE = Proposed for federal listing as "endangered."

PT = Proposed for federal listing as "threatened."

C = A candidate species under review for federal listing. Candidates include taxa for which USFWS has sufficient biological information to support a proposal to list as endangered or threatened.

State:

SE = Listed as "endangered" under the California Endangered Species Act.

SR = Listed as "rare" under the California Endangered Species Act.

ST = Listed as "threatened" under the California Endangered Species Act.

RPR:

1A = Plants of highest priority; plants presumed extinct in California.

1B = Plants of highest priority; plants rare and endangered in California and elsewhere.

2 = Plants rare, threatened, or endangered in California, but more common elsewhere.

3 = Plants requiring additional information; a review list.

4 = Plants of limited distribution; a watch list.

TABLE 4.4-4 **SPECIAL-STATUS ANIMAL SPECIES KNOWN OR SUSPECTED FROM THE VACAVILLE GENERAL PLAN STUDY AREA VICINITY**

Common Name *Scientific Name*	STATUS Federal/State	Habitat	Likelihood of Occurrence
Invertebrates			
Conservancy Fairy Shrimp *(Branchinecta conservation)*	FE / –	Occurs in ephemeral or temporary pools of somewhat turbid fresh water (vernal pools) that form in the cool, wet months of the year.	Absent, playa pool habitat absent
Vernal pool Fairy Shrimp *(Branchinecta lynchi)*	FT / –	Inhabit pools with clear to tea-colored water, most commonly in grass or mud bottomed swales, or basalt flow depression pools in unplowed grasslands, but sometimes in sandstone rock outcrops and alkaline vernal pools.	Absent, vernal pool habitat absent
Mid Valley Fairy Shrimp *(Branchinecta mesovalleyensis)*		Inhabits small, shallow, ephemeral, grass-bottomed vernal pools and swales at elevations between approximately 20 and 90 meters above sea level.	Absent, vernal pool habitat absent
Delta Green Ground Beetle *(Elaphrus viridis)*	FE and CH / –	Appears to prefer grassland habitat that is interspersed with vernal pools or playa pools.	Absent, vernal pool grasslands absent
Valley Elderberry Longhorn Beetle *(Desmocerus californicus dimorphus)*	FT and CH / –	Closely associated with blue elderberry (*Sambucus mexicana* or *S. velutina*), which is an obligate host for beetle larvae. Adult Valley elderberry longhorn beetles are usually found upon or flying between elderberry plants.	Potentially present, blue elderberry present
Ricksecker's water scavenger beetle (*Hydrochara rickseckeri*)	– / –	Lives in weedy shallow, open water associated fresh water seeps, springs, farm ponds, vernal pools, and slow-moving stream habitats that pond for a long duration.	Absent, long duration ponding areas absent
Vernal pool Tadpole Shrimp *(Lepidurus packardi)*	FT / –	Inhabits seasonal, vernal pools or swales that form in slight depressions after being inundated following fall and winter rains. The pools contain clear to highly turbid water and have an impervious hardpan, claypan, or basalt layer beneath the soil surface that retains the water for a few months at a time.	Absent, vernal pool habitat absent
Fish			
Chinook Salmon - Winter-run *Oncorhynchus tshawtyscha*	FE / SE	Tends to spawn in the mainstems of rivers (or larger tributaries) in areas of gravel and cobble substrate. Primary conservation concerns are for passage/movement and water quality.	Absent, spawning habitat absent, not known from Alamo Creek
Chinook Salmon-Central Valley fall/late fall-run Evolutionary Significant Unit (ESU) *Oncorhynchus tshawtyscha*	Candidate / –	Tends to spawn in the mainstems of rivers (or larger tributaries) in gravel and cobble substrate. Conservation concerns are for water quality, passage, and riparian habitat protection.	Absent, spawning habitat absent, not known from Alamo Creek

TABLE 4.4-4 **SPECIAL-STATUS ANIMAL SPECIES KNOWN OR SUSPECTED FROM THE VACAVILLE GENERAL PLAN STUDY AREA VICINITY** (CONTINUED)

Common Name *Scientific Name*	STATUS Federal/State	Habitat	Likelihood of Occurrence
Chinook Salmon – Spring-Run *Oncorhynchus tshawtyscha*	FT / CSC	Tends to spawn in the mainstems of rivers (or larger tributaries) in areas of gravel and cobble substrate. Primary conservation concerns are for passage/movement and water quality.	Absent, spawning habitat absent, not known from Alamo Creek
Steelhead – Central California Coast ESU *Oncorhynchus mykiss*	FT / –	Inhabits riparian, emergent, palustrine habitat. Spawning and rearing habitat is usually characterized by perennial streams with clear, cool to cold, fast flowing water with a high dissolved oxygen content and abundant gravels and riffles. Breeding habitat present in Solano County; many streams in county may qualify as critical habitat. Conservation concerns are for water quality, passage, and riparian habitat protection.	Absent, not known from Alamo Creek
Amphibians/Reptiles			
California tiger salamander (*Ambystoma californiense*)	FT/ ST	Vernal pools and permanent waters in grasslands.	Absent, vernal pools are absent
Western pond turtle (*Actinemys marmorata*)	– /CSC	Use permanent or nearly permanent waterbodies in a variety of habitat types. Can be found in ponds, marshes, rivers, streams, and irrigation ditches within grasslands, woodlands, and open forests.	Potentially present in Alamo Creek
Foothill yellow-legged frog (*Rana boylii*)	– / CSC	Perennial creeks and streams usually with cobble bottoms.	Absent, not known from this reach of Alamo Creek
Birds			
Tricolored blackbird (*Agelaius tricolor)*	– / CSC	Nest in dense cattails and tules, riparian scrub, other low dense vegetation, and occasionally in safflower and grain fields. Forage in grasslands and agricultural fields.	Nesting and, foraging habitat present
Swainson's Hawk (*Buteo swainsoni*)	– / ST	Agriculture, valley floor grassland, and vernal pool habitats, and riparian, stream and freshwater marsh habitats.	Nesting and foraging habitat present
Mountain Plover *Charadrius montanus*	– / CSC	Valley floor grassland and vernal pool habitats.	Absent, suitable grassland absent
Short-eared owl (*Asio flammeus*)	– / CSC	Annual and perennial grasslands, prairies, meadows, dunes, irrigated lands, and saline and fresh emergent marshes. Requires dense vegetation for resting and roosting cover, such as tall grasses, brush, ditches, and wetland vegetation.	Nesting habitat absent, foraging habitat present in irrigated field

TABLE 4.4-4 **SPECIAL-STATUS ANIMAL SPECIES KNOWN OR SUSPECTED FROM THE VACAVILLE GENERAL PLAN STUDY AREA VICINITY** (CONTINUED)

Common Name *Scientific Name*	STATUS Federal/State	Habitat	Likelihood of Occurrence
Golden eagle (*Aquila chrysaetos*)	– / CSC; CP	Prefers open terrain for hunting, such as grasslands, deserts, savannahs, and early successional stages of forest and shrub habitats. Nests in rugged, open habitats with canyons and escarpments, typically on cliffs and rock outcroppings; however, they will also nest in large trees including oaks, sycamores, redwoods, pines, and eucalyptus in areas distant from human activity.	Absent, human activity present
Burrowing owl (*Athene cunicularia)*	– / CSC	Nest in burrows in areas of low growing vegetation in grasslands and agricultural fields.	Potentially present although not observed
Northern harrier (*Circus cyaneus)*	– / CSC	Habitat types include brackish and freshwater marshes, alpine meadows, grasslands, prairies, and agricultural lands. Wintering habitat includes fresh and saltwater wetlands, coastal dunes, grasslands, deserts, meadows, and crop lands. Breeding habitat includes fresh water wetlands, coastal brackish wetlands, open wet meadows and grasslands, shrub-steppe, desert sinks, areas along rivers and lakes, and crop fields.	Nesting habitat absent, foraging habitat present
Yellow warbler (*Dendroica petechia brewsteri*)	–/ CSC	Nest in willows and riparian cover.	Habitat present
Yellow-breasted Chat *Icteria virens*	–/ CSC	Requires dense riparian thickets of willows, vine tangles, and dense brush associated with streams, swampy ground, and the borders of small ponds.	Absent, large dense riparian thickets absent
White-tailed kite (*Elanus leucurus*)	– / CP	Nest in grassland and marshland with trees.	Absent, grassland and marshland absent
Grasshopper sparrow *Ammodramus savannarum*	–/ CSC	Inhabit grasslands and marshes. Breeds in open fields and nests consist of a well-concealed open cup on the ground under vegetation.	Absent, extensive grass-lands absent
Song sparrow-Modesto population *Melospiza melodia*	–/ CSC	Primarily breeds in riparian habitat or wetlands.	Potentially present in ripar-ian area
American peregrine falcon (*Falco peregrinus anatum*)	Delisted / SE	Inhabit open woodlands, grasslands, and marshland.	Foraging habitat present
Yellow-headed blackbird *Xanthocephalus xanthocephalus*	– / CSC	Breeds in wetlands and along other western lakes and marshes where tall reeds and rushes are present. Forages in the wetlands and in surrounding grasslands and croplands. In winter, large flocks forage in agricultural areas.	Nesting habitat in tall reeds absent, foraging habitat present
Loggerhead shrike *Lanius ludovicianus*	– / CSC	Open country for foraging; dense shrubs for nesting.	Absent, nesting habitat present in Developed Area
Mammals			

TABLE 4.4-4 **SPECIAL-STATUS ANIMAL SPECIES KNOWN OR SUSPECTED FROM THE VACAVILLE GENERAL PLAN STUDY AREA VICINITY** (CONTINUED)

Common Name *Scientific Name*	STATUS Federal/State	Habitat	Likelihood of Occurrence
Pallid bat *Antrozous pallidus*	– / CSC	Roosts in caves, tunnels, buildings; forages over variety of habitats.	Potentially present in structures of Developed area
Townsend's big-eared bat *Corynorhinus townsendii*	– / CSC	Roosts in caves, tunnels, buildings; forages over variety of habitats.	Potentially present in structures of Developed area
Greater western mastiff-bat *Eumops perotis californicus*	– / CSC	Roosts in crevices of large outcrops; forages over wide variety of habitats.	Roosting habitat absent, foraging habitat present
Western red bat *Lasiurus blossevillii*	– / CSC	Prefers riparian areas where they roost in tree foliage.	Roosting habitat present

Status Designations

Federal:

FE = Listed as "endangered" under the federal Endangered Species Act.
FT = Listed as "threatened" under the federal Endangered Species Act.
PE = Proposed for federal listing as "endangered."
PT = Proposed for federal listing as "threatened."
C = A candidate species under review for federal listing Candidates include taxa for which the USFWS has sufficient biological information to support a proposal to list as endangered or threatened.

State:

SE = Listed as "endangered" under the California Endangered Species Act.
ST = Listed as "threatened" under the California Endangered Species Act.
CP = California fully protected species; individual may not be possessed or taken at any time.
CSC = Considered a "Species of Special Concern" by the CDFG.

Only a few of the conservation areas addressed in the Solano HCP occur in the Brighton Landing Specific Plan area. These conservation areas are: Riparian, Stream, and Freshwater Marsh Conservation Area, Swainson's Hawk Conservation Areas, and Burrowing Owl Conservation Areas.

a. Riparian, Stream, and Freshwater Marsh Conservation Areas

All stream habitats have high conservation value because they contribute to regional water quality. For the purposes of the HCP, priority drainages and watersheds, including Old Alamo Creek, were subdivided into three categories based on site-specific conservation actions: conservation areas Riparian, Stream, and Marsh (RSM) 1, 2, and 3. RSM 1 and 2 occur west of Leisure Town Road and are therefore not within the Specific Plan area. RSM 3 includes Old Alamo Creek within the Brighton Landing Specific Plan area. The primary conservation actions for these areas are restoration of natural floodplain corridors that allow development of natural channel meander patterns, and restoration of riparian and freshwater marsh habitat. The short segment of Old Alamo Creek on the Brighton Landing Specific Plan area constrains the ability to restore the natural floodplain, so the recommended conservation measure is to establish a buffer and manage for enhanced biological values.

b. Swainson's Hawk Conservation Areas

Swainson's hawk occurrences within Solano County are not uniformly distributed. This skewed distribution corresponds to differences in the quality of potential foraging habitat; in Solano County, agricultural landscapes have the highest density of hawk records and grassland/oak savanna areas have the lowest density of records. Clearly, not all potential foraging habitat within the county contributes equally to the conservation of Swainson's hawks; thus, it was necessary in the HCP process to define specific Swainson's hawk conservation areas based on the value of foraging habitat and distribution of Swainson's hawk records. The HCP identifies three Swainson's hawk conservation areas for Solano County. The Irrigated Agriculture Conservation Area is the only one occurring on the Brighton Landing Specific Plan area.

c. Burrowing Owl Conservation Areas

Burrowing owls are an open-country species, naturally inhabiting grasslands, open shrublands, and open woodlands, but have also adapted to human-modified landscapes such as agricultural lands, vacant lots, disturbed fields, roadsides, and railroad rights-of-way. As a result, the Brighton Landing Specific Plan area has an abundance of land that could support burrowing owls. Burrowing owl conservation is tied to the preservation and management of open agricultural lands, similar to Swainson's hawk habitats, as well as valley floor grassland and vernal pools and low-lying grassland communities associated with the Inner Coast Range. These three areas represent the main conservation areas for burrowing owls.

C. Standards of Significance

The Specific Plan would have a significant impact with regard to biological resources if it would:

1. Result in 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, regulations, or by the CDFG or USFWS.
2. Result in a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the CDFG or USFWS.
3. Result in a substantial adverse effect on federally regulated wetlands as defined by Section 404 of the CWA and/or State protected wetlands as defined by the Porter-Cologne Water Quality Control Act through direct removal, filling, hydrological interruption, or other means.
4. 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.

5. Conflict with any applicable land use plans, policies, regulations, or ordinances, of an agency with jurisdiction over the project, adopted for the purpose of protecting biological resources or avoiding and mitigating impacts to biological resources.
6. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan.

D. Impact Discussion

1. Result in 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, regulations, or by the CDFG or USFWS.

Special-status species may be present in the channel of Old Alamo Creek and in the adjacent Developed Area (Subarea O), as well as in the agricultural fields within and adjoining the Specific Plan area boundaries.

As noted in Section A.3.b above, the approved Jepson Parkway Project proposes widening Leisure Town Road and relocating it slightly eastward along the western boundary of the Specific Plan area. This widening would eliminate approximately 240 feet of Old Alamo Creek and 0.34 acres of associated channel and riparian habitat, which could affect two special-status species: Valley elderberry longhorn beetle and western pond turtle. The Brighton Landing Specific Plan depicts conditions assuming the Jepson Parkway Project is completed, as illustrated in Figures 3-4 and 3-5 in Chapter 3 of this Draft EIR. If the Jepson Parkway project is not completed, the Brighton Landing Specific Plan project would cause approximately 43 feet (.045 acres) of impacts to Old Alamo creek as a result of the widening of Elmira Road and Leisure Town Road.

The timing for implementation of the Jepson Parkway project in this area is uncertain; however, the roadway is currently being designed and construction

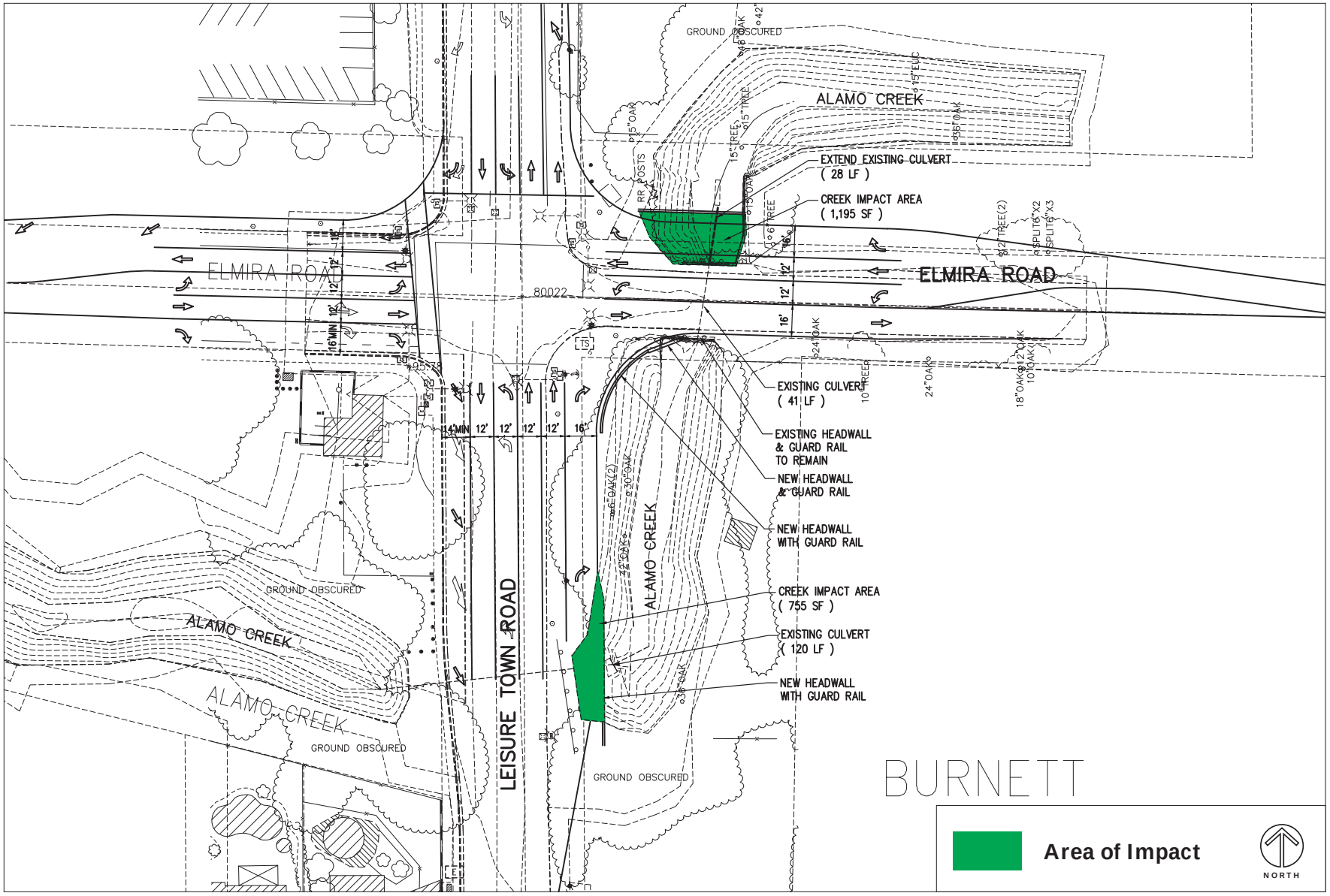
is projected to occur between 2015 and 2018, provided that funding is available and applicable State and federal permits are obtained. If the Jepson Parkway project is not constructed, then the landscaping and sidewalk shown in Figures 3-4 and 3-5 would not be installed, and the existing alignment of Old Alamo Creek within the Specific Plan area would remain as it is. However, as shown in Figure 4.4-2, the proposed Specific Plan would impact Old Alamo Creek on the north side of Elmira Road, due to the proposed widening of Elmira Road. At a minimum, the Specific Plan would fill approximately 0.03 acres of the Old Alamo Creek channel and riparian zone through widening of Elmira Road. In addition, Mitigation Measure TRAF-1 in Section 4.14 of this EIR calls for the widening of Leisure Town Road to address project-specific impacts, which would affect approximately 0.015 additional acres of riparian zone along Old Alamo Creek, for a total of 0.045 impacted acres.

a. Valley Elderberry Longhorn Beetle

The Valley elderberry longhorn beetle potentially occurs in elderberry trees growing on the banks of Old Alamo Creek, and it could potentially be adversely affected by work that would occur in Old Alamo Creek. Seven elderberry bushes/clumps have been identified along Old Alamo Creek within 100 feet of Leisure Town Road.[17] Five elderberry plants are located along the channel west of the road, one of which exhibited at least one beetle exit hole, and two are located on the east side of Leisure Town Road within the boundaries of the Brighton Landing Specific Plan.

Blue elderberry is the obligate host plant for the Valley elderberry longhorn beetle. The female Valley elderberry longhorn beetle lays eggs on elderberry trees and the larvae bore into the pith to feed inside the elderberry stems and trunk. Impacts to blue elderberry plants could potentially affect beetle larvae that are inside the elderberry trees.

[17] Biological Opinion for the Proposed Jepson Parkway Project, Solano County California (District 4-SOL-0-STA) dated May 27, 2010 addressed to Mr. James Richards California Department of Transportation, Oakland and signed by Susan K Moore, Field Supervisor, Sacramento Field Office, US Fish and Wildlife Service. File No. 81420-2008-F-1791-2.



Source: Phillippi Engineering, Inc.

FIGURE 4.4-2

OLD ALAMO CREEK CHANNEL IMPACTS

Valley elderberry beetles are also poor dispersers, and loss of the riparian zone along Old Alamo Creek would create a 360-foot barrier for beetles between remaining segments of the creek. Increasing adjacent development may also increase populations of Argentine ants and earwigs that adversely affect the beetle.

The loss of the riparian habitat and loss of the elderberry plants growing on Old Alamo Creek would result in *significant* impacts to the Valley elderberry longhorn beetle.

Impact BIO-1: The proposed widening of Elmira Road would not directly result in removal of any of the identified elderberry along Alamo Creek, although at least one bush will be adjacent to planned work areas. Additional elderberry plants may be directly impacted by activities required to armor the stream banks at the Frost Drain outfall into Old Alamo Creek and through potentially increased downstream erosion from future stormwater discharges (see Hydrology and Water Quality, Section 4.9, Impact HYDRO-4). In addition, the loss of dispersal and foraging riparian habitat along Old Alamo Creek in and downstream of the Specific Plan Area could result in significant adverse effects to the Valley elderberry longhorn beetle. If this portion of the Jepson Parkway Project is built prior to construction of the Brighton Landing Specific Plan, mitigating impacts to the Valley elderberry beetle within the section of creek between Leisure Town Road and Elmira Road will be the responsibility of STA. If the creek channel in this segment or downstream of the Specific Plan Area is impacted as a result of actions for the Brighton Landing Specific Plan, including actions associated with stormwater discharge, the following measures shall be required:

> Mitigation Measure BIO-1a: The applicant shall survey Old Alamo Creek, including the Frost Drain outfall, for elderberry bushes and shall replace all impacted Valley elderberry longhorn beetle habitat by em-

ploying the following measures, adapted from the Biological Opinion for the Jepson Parkway project:[18]

- Transplant all elderberry shrubs within the affected reach of Old Alamo Creek to other suitable areas, including along Old Alamo Creek; within the 100-foot buffer beside the Riparian Area as mentioned in Mitigation Measures BIO-2b, 10b and 10c; or at other locations approved by the USFWS. Transplanting shall occur between June 15 and March 15 (November through February is the optimal period for transplanting). Elderberry may not be transplanted between March 16 and June 14, except where isolated bushes are located more than 0.5 miles from other suitable Valley elderberry longhorn beetle habitat and only if no signs of use by beetles (exit holes) have been identified.
- Plant a minimum of five elderberry seedlings or rooted cuttings, and five associated native, woody riparian plants for each elderberry bush removed/transplanted as a result of Specific Plan implementation.
- Trimming/removal of stems one-inch or greater shall be mitigated in the following manner: for every ten elderberry stems one-inch or greater in diameter trimmed/removed, plant two elderberry seedlings and two native, associated woody riparian plant seedlings.
- A permanent buffer of 100 feet shall be established between the riparian canopy of Old Alamo Creek and the development proposed at Brighton Landing.

If specific traffic improvements or other construction activities for the Brighton Landing Specific Plan require work along Old Alamo Creek within 100 feet of any additional elderberry plans, the following additional avoidance and minimization measures shall be implemented:

[18] Biological Opinion for the Proposed Jepson Parkway Project, Solano County California (District 4-SOL-0-STA) dated May 27, 2010 addressed to Mr. James Richards California Department of Transportation, Oakland and signed by Susan K Moore, Field Supervisor, Sacramento Field Office, US Fish and Wildlife Service. File No. 81420-2008-F-1791-2.

1. A minimum setback of 20 feet from the dripline of the elderberry plant shall be established between the development and all elderberry plants containing stems measuring one inch or greater in diameter at ground level. The setback shall be fenced and flagged in order to prevent encroachment of equipment and materials. If ground-disturbing work must encroach within this 20-foot setback to place critical infrastructure that cannot be located elsewhere, four additional elderberry trees for each affected elderberry shall be planted within the channel restoration area or at a nearby location on Old Alamo Creek.

2. All contractors shall be briefed on the need to avoid damaging the elderberry plants and the possible penalties for not complying with these requirements. Work crews shall be instructed on the status of the beetle and the need to protect its elderberry host plant.

3. Signs shall be placed every 50 feet along the edge of the 20-foot setback with the following information: "This area is habitat of the Valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act. Violators are subject to prosecution, fines, and imprisonment." The signs shall be clearly readable from a distance of 20 feet, and must be maintained for the duration of construction.

4. Following completion of construction work affecting the 100-foot buffer zone, any damage done to the buffer zone shall be restored with native erosion control seed mixes and native riparian plant species, as appropriate.

5. The 100-foot buffer zones must continue to be protected after construction from adverse effects of the development project. Protection measures such as fencing and signage shall be included in the project plans and subject to the approval of the City of Vacaville.

6. No insecticides, herbicides, fertilizers, or other chemicals that might harm the beetle or its host plant shall be used within 100 feet of any

elderberry plant with one or more stems measuring one inch or greater in diameter at ground level.

7. A qualified Biologist shall be retained to monitor implementation and compliance of all the above measures.

Significance After Mitigation: *Less than significant.*

b. Western Pond Turtle

The western pond turtle occurs in Old Alamo Creek and would be adversely affected by the direct loss of the approximately 0.045 acres of channel and riparian habitat within the Specific Plan boundaries. Western pond turtles require suitable upland areas adjacent to their aquatic habitat for the deposition of eggs. The existing Developed Area provides suitable habitat in the non-native grassland understory and ornamental vegetation to allow for the deposition of turtle eggs. Any work in the bed or banks of Old Alamo Creek could potentially affect western pond turtles.

Loss of the adjacent uplands and this section of Old Alamo Creek would s*ignificantly* impact western pond turtles.

Impact BIO-2: The Specific Plan would significantly impact western pond turtles by harming them during construction should they move into the construction area, by removing potential breeding habitat beside the riparian area after construction, and by reducing their ability to move between upstream and downstream segments of Old Alamo Creek.

Mitigation Measure BIO-2a: If the Brighton Landing project is constructed prior to the Jepson Parkway project, exclusion fencing shall be installed and maintained between Specific Plan work areas and the riparian area during all work activities to prevent western pond turtles and other animals from entering the construction area. Exclusion fencing shall consist of silt fabric, plywood, aluminum or another material approved by USFWS and/or CDFG; shall be at least 3 feet in height; and shall extend a minimum of 200 feet beyond the creek on either side of

work areas. The base of the fence shall be buried in the ground to prevent animals from crawling under. The remainder of the fence shall be left above ground to serve as a barrier for animals moving on the ground surface. The fence shall be pulled taut at each support to prevent folds or snags. Construction personnel shall also install an orange plastic-mesh construction fence 1 foot on the development side of the exclusion fence to increase visibility, unless the exclusion fence is composed on highly visible materials. Exclusion fencing shall be inspected and repaired on a weekly basis during construction work. If the Jepson Parkway project is constructed prior to the Brighton Landing Project and the Old Alamo Creek Channel is not relocated within Subarea O, Mitigation Measure BIO-2a is not applicable.

Mitigation Measure BIO-2b: The loss of riparian and stream habitat for the western pond turtle in relation to the Brighton Landing Project can be mitigated by providing riparian and creek habitat at an alternative offsite location where western pond turtles are present (see Mitigation BIO-10a).

Mitigation Measure BIO-2c: If the Brighton Landing project is constructed prior to the Jepson Parkway project, maintain a 100-foot buffer between the canopy of riparian vegetation and the edge of proposed residential or commercial development. This buffer area shall be available as breeding habitat for western pond turtles. If the Jepson Parkway is constructed prior to the Brighton Landing Project and the Old Alamo Creek Channel is not relocated within Subarea O, Mitigation Measure BIO-2c is not applicable.

Significance After Mitigation: *Less than significant.*

c. Song Sparrow – Modesto Population and Yellow Warbler

The Modesto population of the song sparrow and the yellow warbler could occur in the riparian vegetation of the Brighton Landing Specific Plan area and could be adversely affected by the proposed project.

Song sparrows and yellow warblers could occur in the riparian woodlands along the reach of Old Alamo Creek within the Specific Plan area. Proposed construction adjacent to Old Alamo Creek could disturb nesting song sparrows and warblers during the nesting season (March through August). Conversion of the existing low-density development to more dense urban development, as proposed in the Brighton Landing Specific Plan, would also reduce the area available to song sparrows and warblers for foraging.

The proposed Specific Plan would impact the foraging area and nesting of the Modesto population of song sparrows and yellow warblers, and this would be a *significant impact*.

Impact BIO-3: The Specific Plan could significantly impact foraging habitat and nesting of the Modesto population of the song sparrow and yellow warblers due to construction activity and removal of habitat adjacent to the riparian vegetation.

Mitigation Measure BIO-3a: Mitigation Measures BIO-2c and BIO-10a through 10c adequately mitigate impacts to the foraging and nesting habitat of the Modesto population of the song sparrow and yellow warbler.

Mitigation Measure BIO-3b: Construction activities within 50 feet of the riparian area should be avoided during the nesting season (March 1 to August 31) or alternatively, for any construction activities conducted during the nesting season, a qualified biologist (i.e., experienced in searching for passerine nests) shall conduct a preconstruction nest survey of all trees or other suitable nesting habitat in and within 50 feet of the limits of work. The survey shall be conducted no more than 15 days prior to the start of work. If the survey indicates the presence of nesting birds, the biologist shall determine an appropriately sized buffer around the nest in which no work shall be allowed until the young have successfully fledged. The size of the nest buffer shall be determined by the biologist in consultation with CDFG and shall be based on its sensitivity to disturbance. In general, buffer sizes of up to 50 feet for song sparrows and war-

blers should suffice to prevent substantial disturbance to nesting birds, but these buffers may be increased or decreased, as appropriate, depending on the level of disturbance anticipated near the nest and the sensitivity of the birds to construction activity.

Significance After Mitigation: *Less than significant.*

d. Swainson's Hawk

Swainson's hawks would experience a loss of available irrigated agricultural foraging areas and potential nest trees. Although there are currently no known nests in the Specific Plan area, should nests become established on or adjacent to the site prior to site development, construction activities could disturb nesting Swainson's hawks and destroy eggs, or harm or kill nestlings.

Swainson's hawks forage in agricultural fields and nest in adjacent tall trees that occur in Developed, Riparian, or Agricultural Field areas. Conversion of foraging habitat in the agricultural fields and seasonal wetlands to other uses, or removal of potential nest trees would reduce the habitat available to Swainson's hawks. Such a reduction in habitat could result in a reduction in the numbers of Swainson's hawks and therefore would constitute a substantial adverse impact.

Swainson's hawks would be significantly impacted by a loss of approximately 228.59 acres of agricultural foraging habitat[19] and loss of potential nest trees in the Old Alamo Creek riparian corridor and developed area. Swainson's hawks are generally relatively tolerant of human activity, but potential loss or destruction of nests, eggs, and nestlings could be expected to occur (at minimum) within 0.25 miles of the Specific Plan area, depending on the individual tolerances of the nesting pair of hawks, weather conditions, and timing of disturbance in relation to the occurrence of nesting and hatching.

[19] Swainson's hawks may also use the seasonal wetland habitat for foraging. Mitigation required for this habitat is addressed below and, if implemented, will adequately address loss of the 0.04 acres of Swainson's hawk foraging habitat represented by the seasonal wetlands.

Impact BIO-4: Swainson's hawks would be significantly impacted by a loss of approximately 228.59 acres of foraging habitat, loss of potential nest trees in the developed area and along Old Alamo Creek, and potential destruction of nests, eggs, and nestlings.

Mitigation Measure BIO-4a: An Approved Biologist shall conduct preconstruction nest surveys between March 1 and August 31 to identify any nesting Swainson's hawks. Surveys shall be conducted within 15 days prior to the anticipated start of construction for any phase or Specific Plan component, and shall be designed and of sufficient intensity to document nesting within 0.25 mile (1,320 ft) of planned work activities. If a lapse in Specific Plan-related construction work of 15 days or longer occurs, additional preconstruction surveys shall be required before Specific Plan work may be reinitiated.

Mitigation Measure BIO-4b: If a nest is encountered during a preconstruction survey, construction work (including grading, earthmoving, and any operation of construction equipment) shall not occur within a 0.25 mile buffer zone around an active Swainson's hawk nest, except as provided below. Construction work may commence within the buffer zone when an Approved Biologist has confirmed that nesting activity is complete (i.e., Swainson's hawk young have fledged and are capable of flight, or the adults have abandoned the nest for a minimum of seven days). Nest trees may be removed between September 1 and February 1, when nests are unoccupied. Removal of a previously active, but currently unoccupied nest may require a 2081 Take Permit from the CDFG.

The size of nest site buffer zones may be reduced only under the following conditions:

1. A site-specific analysis prepared by an CDFG Approved Biologist indicates that the nesting pair under consideration would not be adversely affected by construction activities. CDFG shall be provided

the option of approving this analysis before construction may begin within 0.25 mile of a nest.

2. Monitoring by a CDFG Approved Biologist is conducted for a sufficient time (minimum of 10 consecutive days following the initiation of construction) and the nesting pair does not exhibit adverse reaction to construction activities (i.e., changes in behavioral patterns, reactions to construction noise).

3. Monitoring is continued at least once a week through the nesting cycle at that nest.

4. Monitoring reports are submitted to the City of Vacaville and CDFG (or the Solano County Water Agency if the Solano HCP is approved by the time of construction).

If adverse effects are identified (e.g., the adults or juvenile birds react to construction activities), construction activities shall cease immediately and construction shall not be resumed until the Approved Biologist, in consultation with CDFG, has determined that nesting activity is complete or that construction may continue under modified restrictions.

Mitigation Measure BIO-4c: If a nest tree becomes occupied by Swainson's hawks during ongoing construction activities, construction activities shall not occur within 500 feet of the nest, except where monitoring consistent with the criteria in Mitigation Measure 4b documents that adverse effects will not occur.

Mitigation Measure BIO-4d: The Specific Plan proponent shall preserve a minimum of 229 acres of Swainson's hawk irrigated agricultural foraging habitat. The preservation of the mitigation area shall be accomplished through purchase of credits from a CDFG approved mitigation bank or through preservation of irrigated agricultural lands protected in perpetuity by a conservation easement. Such an easement will need to include provisions that would provide for agricultural uses that are compatible with Swainson's hawk foraging needs. Agricultural foraging habitats con-

sist of alfalfa, tomatoes, other annual vegetable row crops, and grain. The mitigation area shall not include crop types and land uses incompatible with Swainson's hawk foraging. The following additional restrictions and prohibited uses, at a minimum, shall also be noted as forbidden within the conservation easement:

- Commercial feedlots, which are defined as any open or enclosed area where domestic livestock are grouped together for intensive feeding purposes.
- Horticultural specialties, including sod, nursery stock, ornamental shrubs, ornamental trees, Christmas trees, or flowers.
- Commercial greenhouses or plant nurseries.
- Commercial aquaculture of aquatic plants, animals, and their byproducts.
- Planting orchards or vineyards for the production of fruits, nuts, or berries except in designated farmstead areas.
- Cultivation of perennial vegetable crops such as artichokes and asparagus, as well as annual crops such as cotton or rice.
- Construction, reconstruction, or placement of any building, billboard or sign, antennas, towers, and facilities for generation of electrical power, or any other structure or improvement of any kind, except as may be specifically permitted in site-specific management plan. Acreage occupied by any such existing facilities may not be counted toward mitigation requirements.

CDFG shall approve the site, conservation easement, and conservation easement holder. The agricultural buffer area along the eastern portion of the site does not provide appropriate mitigation habitat because: it is too close to urban development; it would allow uses such as alternative energy facilities that are not compatible with hawk foraging; and because the PG&E easement would preclude or complicate a conservation easement over the same property.

Mitigation Measure BIO-4e: Specific Plan activities resulting in the destruction or removal of a known or active Swainson's hawk nest site shall preserve an active nest site, in the removed nest's stead. Preservation of an active nest site may be achieved through purchase of occupied nest credits from an approved mitigation bank or through a Specific Plan-specific reserve approved by CDFG. If preserved active nest sites are unavailable, Specific Plan proponents shall provide funding to the Solano HCP's *Interim Nest Protection Program*.

Take of a known or active nest tree would occur if:

1. The activity directly removes the nest tree or involves soil compaction or grading (excavation or fill) on soils covering more than 25 percent of the root zone of the nest tree. The root zone may be determined by a qualified arborist, but shall (at a minimum) include all areas within a distance from the trunk that is equal to the tree's height or within the outer edge of the tree's canopy.
2. The Specific Plan activity indirectly affects the nest such that when active, Swainson's hawks are disturbed to a degree that causes, or is likely to cause: injury to the nesting birds; a decrease in productivity by substantially interfering with normal breeding, feeding, or sheltering behavior; or nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior. Activities within 250 feet of an active nest are presumed to have a long-term indirect effect the nest.

If the Approved Biologist determines that the Specific Plan potentially indirectly affects a nest, the Specific Plan proponent shall obtain any necessary authorizations, such as a 2081 Incidental take Permit from CDFG, and implement any required additional mitigation as required by CDFG. Such measures may include protection of other known nest sites or potential nesting habitat; planting and protection of trees to create suitable future nesting habitat; or otherwise increasing the amount of preserved foraging habitat.

Significance After Mitigation: *Less than significant.*

e. Burrowing Owl

Burrowing owls occur in a variety of locations in and around Vacaville. Typical habitat includes vacant lots or grassland areas, typically with short to sparse vegetation cover, and areas around the edges of agricultural fields. Burrowing owls rely on a variety of overhead structures for cover, such as underground burrows of ground squirrels, debris piles, and old tires. Burrowing owls are present in Vacaville as both a resident/nesting species and as a winter migrant. Burrowing owls were not observed in the Specific Plan area during the limited field studies for the Specific Plan. However, they could be present or could colonize the site prior to construction of Specific Plan developments. The proposed Specific Plan would remove approximately 229 acres of suitable habitat of the burrowing owl (228.59 acres of Agricultural Fields, including 0.04 acres of seasonal wetlands. If burrows used by burrowing owls are present on the site and if owls colonize these burrows, grading and the operation of heavy equipment would result in the destruction of burrows; the death of any resident owls; and potential destruction of eggs, nestlings, or nests, which would be a *significant* impact.

Impact BIO-5: Burrowing owls would be significantly impacted by: a loss of 228.59 acres of foraging habitat; loss of potential nesting habitat; and potential destruction of eggs, nestlings, and nesting adult burrowing owls.

Mitigation Measure BIO-5a: Between February 1 and August 31, an Approved Biologist shall conduct preconstruction surveys within known or suitable habitat areas to identify and subsequently avoid nesting areas for burrowing owls. Surveys shall be conducted within 15 days prior to the anticipated start of construction, and shall follow standard survey protocols developed by the Burrowing Owl Consortium or as contained in the most current draft of the Solano HCP.[20] If a lapse in Specific Plan related

[20] This measure is from the Solano HCP's, *Avoidance and Minimization Measure BO 1: Preconstruction Surveys.*

construction work of 15 days or longer occurs during the nesting season, additional preconstruction surveys shall be required before Specific Plan work may be reinitiated.

Mitigation Measure BIO-5b: If burrowing owls are identified on the site during preconstruction surveys, the following measures shall be implemented for new construction activities.

1. During the non-breeding season (September 1–January 31), a circular exclusion zone with a radius of 160 feet shall be established around occupied burrows. If a buffer cannot be established (except as provided below) and upon approval from CDFG, burrowing owls shall be evicted from the entire construction area using passive relocation techniques. One-way doors shall be installed in all suitable burrows, left in place for a minimum of 48 hours, and monitored daily to evaluate owl exclusion and to ensure doors are functioning properly. Burrows shall then be excavated, using hand tools whenever possible, and refilled to prevent reoccupation. Sections of flexible plastic pipe shall be inserted into burrows during excavation to maintain an escape route for any animals inside the burrow.

2. During the breeding season (February 1–August 31), a qualified burrowing owl biologist shall establish a circular exclusion zone with a radius of 250 feet around each occupied burrow. No construction-related activity (e.g., site grading, staking, surveying, or any use of construction equipment) shall occur within the exclusion zone during the breeding season. Once the breeding season is over, passive relocation may proceed as described in No. 1 above.

3. Construction buffers may be reduced from 250 feet for breeding season buffers and 160 feet for non-breeding season buffers in accordance with the following requirements:
   a. A site-specific analysis prepared by an Approved Biologist indicates that the nesting pair(s) or wintering owl(s) would not be adversely affected by construction activities. The City of

Vacaville and the CDFG shall approve this analysis in writing before construction can proceed;

b. Monitoring by an Approved Biologist is conducted for a sufficient time (minimum of 10 consecutive days following the initiation of construction) and the nesting pair does not exhibit adverse reaction to construction activities (e.g., changes in behavioral patterns, reactions to noise) and the burrows are not in danger of collapse due to equipment traffic;
c. Monitoring is continued at least once a week through the nesting/wintering cycle at that site and no change in behavior by the owls is observed; and
d. Monitoring reports are submitted to the City of Vacaville and CDFG.

If adverse effects are identified, construction activities shall cease immediately and construction shall not be resumed until the Approved Biologist, in consultation with the City of Vacaville and CDFG, has determined that nesting activity is complete or that construction may continue under modified restrictions.

Mitigation Measure BIO-5c: Mitigation for the permanent loss of 228.59 acres of burrowing owl habitat for urban development or other permanent facilities shall be provided at a 1:1 land/area ratio. This measure may be accomplished in conjunction with Swainson's hawk Mitigation BIO-4d, above, provided the following additional measures are implemented.

- At least 5 acres of mitigation area shall be permanently taken out of agricultural production to provide suitable nesting habitat and cover for burrowing owls.
- At least four artificial burrow complexes (three multi-entrance burrows per complex) shall be installed within the habitat set aside for burrowing owls.
- Vegetation within the owl habitat shall maintain an average effective vegetation height less than or equal to 6 inches from February 1 to

April 15, when owls typically select mates and nest burrows. In addition, tree and shrub canopy cover shall be limited to the edges of the set aside area and shall not be within 200 feet of the artificial burrows.

- Adequate funding shall be provided to manage the owl mitigation area, including maintenance of the artificial burrows and grass height, in perpetuity.

Significance After Mitigation: *Less than significant.*

f. Tricolored Blackbird and Loggerhead Shrike

The proposed Specific Plan would reduce the amount of available foraging and nesting habitat for tricolored blackbird and loggerhead shrike. Construction of the proposed Specific Plan's developments could also disturb nesting tricolored blackbirds and loggerhead shrikes, and destroy eggs or harm or kill nestlings.

Tricolored blackbirds forage in agricultural fields and nest in dense grain and safflower fields. Although not observed nesting on-site, the Agricultural Fields provide 228.59 acres of foraging habitat and potential nesting habitat for tricolored blackbirds. Loggerhead shrikes forage in grassland and agricultural areas for insects and small vertebrates such as mice, lizards, and frogs. They nest in open stands of shrubs and/or small trees. The loss of trees and shrubs within the 7-acre Developed Area and along the edge of the riparian area along Old Alamo Creek would reduce the amount of nesting habitat available for the loggerhead shrike. Similar to the burrowing owl, the shrike would also experience the loss of approximately 228.59 acres of foraging and nesting habitat, which would be a *significant* impact.

Impact BIO-6: Tricolored blackbirds and loggerhead shrikes would be significantly impacted by: a loss of approximately 228.59 acres of foraging habitat; loss of potential nesting habitat; and potential destruction of eggs and nestlings.

Mitigation Measure BIO-6a: An Approved Biologist shall conduct preconstruction nest surveys between March 1 and August 31 to identify any nesting tricolored blackbirds and loggerhead shrikes. Surveys shall be conducted within 15 days prior to the anticipated start of construction. If a lapse in Specific Plan related construction work of 15 days or longer occurs, additional preconstruction surveys shall be required before Specific Plan work may be reinitiated.

Mitigation Measure BIO-6b: If nests are encountered during a preconstruction survey, construction work (including grading, earthmoving, and any operation of construction equipment) shall not occur within a 150-foot buffer zone around an active tricolored blackbird colony and a 50-foot buffer around a loggerhead shrike nest, except as provided below. Construction work may resume within the buffer zone when an Approved Biologist has confirmed that nesting activity is complete (i.e., the young have fledged and are capable of flight, or the adults have abandoned the nest for a minimum of seven days).

The size of nest site buffer zones may be reduced only under the following conditions:

1. A site-specific analysis prepared by an Approved Biologist indicates that the nesting pair under consideration would not be adversely affected by construction activities. Construction within a nest buffer zone shall be subject to approval from the City of Vacaville and CDFG before any construction activity within 50 feet of a nest.
2. Monitoring by an Approved Biologist is conducted for a sufficient time (minimum of five consecutive days following the initiation of construction) and the nesting pair does not exhibit adverse reaction to construction activities (i.e., changes in behavioral patterns, reactions to construction noise).
3. Monitoring is continued at least once a week through the nesting cycle at that nest.

4. Monitoring reports are submitted to the City of Vacaville and CDFG.

If adverse effects are identified, construction activities shall cease immediately and construction shall not be resumed until the Approved Biologist, in consultation with CDFG, has determined that nesting activity is complete or that construction may continue under modified restrictions.

Mitigation Measure BIO-6c: Mitigation Measures BIO-4d for Swainson's hawk and Mitigation Measure BIO-5c for burrowing owl, in conjunction with the following, shall mitigate loss of nesting habitat for loggerhead shrikes. Twenty-five native shrubs shall be established on the Swainson's hawk and/or burrowing owl foraging habitat to provide nesting substrate for loggerhead shrikes.

Mitigation Measure BIO-6d: In the unlikely event that an occupied tricolored blackbird colony is impacted, the Specific Plan proponent shall preserve a known colony (one that has been active within the last five years) within Solano County, through purchase of a conservation easement. If the Specific Plan proponent cannot practicably obtain a conservation easement for a known colony, the Specific Plan proponent shall evaluate the potential to establish tricolored blackbird nesting habitat in the detention basin and, if practicable, shall develop and implement a plan approved by both the City and CDFG.

Significance After Mitigation: *Less than significant.*

g. Yellow-Headed Blackbird, Short-Eared Owl, and Northern Harrier

A loss of approximately 228.59 acres of potential foraging habitat in agricultural fields would occur for yellow-headed blackbird, short-eared owl, and northern harrier.

These species may periodically forage in the agricultural areas of the Brighton Landing Specific Plan area. The yellow-headed blackbird forages for insects

and post-harvest grain in agricultural fields. Similarly, the short-eared owl and northern harrier forage for vertebrate prey in agricultural fields. Loss of foraging areas would result in a *significant* impact to these species.

Impact BIO-7: Yellow-headed blackbird, short-eared owl, and northern harrier would be significantly impacted by a loss of 229 acres of foraging habitat in nearby agricultural fields.

> Mitigation Measure BIO-7: Mitigation Measures BIO-4d for Swainson's hawk and Mitigation Measure BIO-5c for burrowing owl serve to mitigate loss of nesting habitat of yellow-headed blackbird, short-eared owl, and northern harrier.
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> Significance After Mitigation: *Less than significant.*

h. Pallid Bat and Townsends' Western Big-eared Bat

Potential roosting habitat of pallid bat and Townsend' western big-eared bat would be affected by implementation of the Specific Plan.

Pallid bats and Townsend's western big-eared bats potentially roost in the buildings of the Developed Area. These buildings could be removed as part of the proposed Brighton Landing Specific Plan project. Removal of the buildings would result in a temporary loss of roosting habitat and would result in harm to individual bats if removal were to occur when bats are present. This would represent a *significant* impact.

Impact BIO-8: The proposed Specific Plan could significantly impact roosting habitat of pallid bat and western Townsend's big-eared bat, and bats would potentially be harmed by the removal process.

> Mitigation Measure BIO-8a: An Approved Biologist shall conduct preconstruction roost surveys between March 1 and August 31 to identify any roosting bats. Surveys shall be conducted within 30 days prior to the anticipated removal of habitat.

Mitigation Measure BIO-8b: If a maternity roost is encountered during a preconstruction survey, demolition of the roost shall wait until September 15, when the young can live independently of the adults. Prior to demolition, the bats shall be excluded by an experienced expert. If the roost is not a maternity roost, then the bats shall be excluded from the roost by the certified expert prior to demolition.

Mitigation Measure BIO-8c: A bat roost shall be created within 5 miles of the Specific Plan area. A conservation easement shall be placed on the mitigation bat roost to ensure that it is not destroyed. The bat roost shall be monitored until it can be demonstrated that bats have used the mitigation roost for 3 years in a row. An endowment of sufficient value shall be established to provide for ongoing maintenance of the bat roost. The City of Vacaville shall approve the size of the endowment.

Significance After Mitigation: *Less than significant.*

i. Non-native Species

The Specific Plan could facilitate the colonization of the Specific Plan area and adjacent natural and agricultural areas by non-native species, thereby reducing the value of these areas to special-status species.

Non-native plant species would disperse from landscaping in the proposed Brighton Landing Specific Plan area into nearby agricultural lands and natural areas, including the adjacent riparian areas. Non-native plants displace native species and thereby reduce the wildlife value of areas. In open spaces, invasive plants can become established in disturbed or out-of-the-way areas, at which time they become more difficult to eradicate or control. Populations in such out-of-the-way areas provide a source of propagules (seeds, buds, leaves, or stems that can generate new plants) that would continue to invade natural areas and displace habitat of special-status species. In addition, if the proposed detention pond has water year-round, it could provide breeding habitat for American bullfrogs. The young of the bullfrogs could disperse into native

habitat and reduce the value of that habitat for other wildlife. Bullfrogs are a predator on native wildlife and may have impacts on special-status species, such as juvenile western pond turtles.

Implementation of the proposed Brighton Landing Specific Plan would increase the possibility of colonization of special-status species habitat by invasive species of plants and American bullfrogs. This would be a *significant* impact.

Impact BIO-9: Implementation of the proposed Brighton Landing Specific Plan would result in the colonization of habitat of special-status species by invasive species of plants and animals, which would be a significant impact.

Mitigation Measure BIO-9a: The species listed in the Table 4.4-5 are particularly invasive ornamental plants and shall be prohibited from being planted in open space areas, parks, public landscaping in street rights-of-way, or on the future private school site, within the Specific Plan area. These restrictions shall be incorporated into the Specific Plan development standards. Prior to approval of final landscape plans, the plant palette for any Developer-implemented landscaping shall be reviewed by a biologist to ensure that the species in Table 4.4-5 and species listed in the California Invasive Plant Council's Invasive Plant Inventory are not included in the landscaping for the site.

Mitigation Measure BIO-9b: The detention basin shall be designed to minimize the breeding and expansion of non-native species, such as bullfrog and warm-water fish, which require year-round water. The basin shall be managed such that a permanent pool is not created, and the basin dries out each year.

Significance After Mitigation: *Less than significant.*

TABLE 4.4-5 **PROHIBITED ORNAMENTAL PLANT SPECIES**

Scientific Name	Common Name
Trees	
Acacia decurrens	Green wattle
Acacia melanoxylon	Black acacia
Ailanthus altissima	Tree-of-heaven
Eucalyptus globulus	Blue-gum
Robinia pseudoacacia	Black locust
Schinus terebinthifolius	Brazilian pepper
Tamarix spp.	Tamarisk
Shrubs	
Cotoneaster franchetii	Cotoneaster
Cotoneaster pannosa	Cotoneaster
Crataegus monogyna	Hawthorn
Cytisus multiflorus	Spanish broom
Cytisus scoparius	Scotch broom
Genista monspessulana	French broom
Pyracantha spp.	Pyracantha
Rubus discolor	Himalayan blackberry
Ulex europaea	Gorse
Vines	
Delaria odorata (=*Senecio mikanioides*)	Cape ivy (German ivy)
Hedera helix	English ivy

Scientific Name	Common Name
Herbs	
Arctotheca calendula	Capeweed
Cynara cardunculus	Artichoke thistle
Erigeron karvinskianus	Mexican daisy
Euphorbia esula	Leafy spurge
Euphorbia oblongata	Spurge
Vinca major	Greater periwinkle
Carpobrotus edulis	Ice plant
Grasses	
Arundo donax	Giant reed
Cortaderia jubata	Andean Pampas grass
Cortaderia selloana	Pampas grass
Cynodon dactylon	Bermuda grass
Nassella (*Stipa*) *tenuissima*	Mexican feather grass; silky thread grass
Pennisetum clandestinum	Kikuyu grass
Pennisetum setaceum	Fountain grass

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2. Result in a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the CDFG or USFWS.

There would be significant impacts to Old Alamo Creek and its riparian habitat through direct habitat loss by the implementation of the proposed Brighton Landing Specific Plan.

The Solano HCP classifies Old Alamo Creek as a Priority Drainage. Under the Draft HCP Mitigation Measures, a 4:1 mitigation ratio is required for permanent loss of habitat. This mitigation ratio applies to both acreage (area to be restored or enhanced) and tree/shrub replacement establishment requirements.

Implementation of the Brighton Landing Specific Plan could eliminate approximately 0.03 acre of channel and mature woody riparian habitat along Old Alamo Creek for widening of Elmira Road, as well as 0.015 acres of vegetation along the west bank of Old Alamo Creek if widening of Leisure Town Road is required. In addition, if Jepson Parkway is built, the construction of the pathway and landscaped area proposed in Subarea O would result in the removal of trees and plants, and replace valuable wildlife habitat with public access and landscaping. Moreover, implementation of the proposed Specific Plan would also potentially impact sections of Old Alamo Creek and its associated aquatic and riparian habitats within and downstream of the Specific Plan Area, including the creek reaches that are not directly removed by construction. The proposed Specific Plan would have the potential to: reduce the width of or eliminate any significant buffer between the creek and developed land; increase runoff and erosion; and increase the deposition of urban pollutants and sediment. This would be a *significant* impact on riparian habitat along Old Alamo Creek.

Impact BIO-10: Implementation of the Specific Plan would result in significant impacts to Old Alamo Creek and its riparian habitat by reducing the width of the adjacent buffer, increasing run-off and erosion, increasing the deposition of pollutants and sediment, and harming or removing riparian trees and shrubs. As described in Section 4.9, Hydrology and Water Quality, increased runoff generated from the urban land uses proposed by the Specific Plan could cause an increase in discharge of pollutants, and in erosion or siltation downstream of the Specific Plan area.

> Mitigation Measure BIO-10a: The Applicant shall develop plans to enhance remaining portions of Old Alamo Creek or other approved offsite

location to mitigate both the loss of riparian habitat from the widening of Elmira Road and any additional impacts associated with the storm drain outfall to the creek east of the Specific Plan Area. At a minimum, 0.18 acres of riparian habitat (a 4:1 ratio relative to the loss of 0.045 acres of riparian habitat) shall be enhanced through planting of desirable native species and removal of exotic vegetation. All affected riparian tree and shrub species shall also be re-established at a 4:1 ratio; that is at the end of a minimum 5-year monitoring period and after 2 years of no significant intervention (e.g., additional planting or irrigation), four times the affected number of trees and shrubs shall be established in good condition within the restoration area. This may require initial plantings at a higher than 4:1 ratio. The location of and plan for riparian restoration and enhancement shall be reviewed and approved by the City and CDFG prior to implementation.

Mitigation Measure BIO-10b: Implementation of Mitigation Measure BIO-2c, which establishes building setbacks along Old Alamo Creek in Subarea O mitigates impacts associated with urban encroachment and will help promote continued biological connectivity.

Mitigation Measure BIO-10c: Mitigation Measures HYDRO-1, HYDRO-2, and HYDRO-6 shall be implemented and will generally reduce downstream impacts to water quality. The Stormwater Master Plan required under Mitigation Measure HYDRO-6 shall further evaluate the effects on the two-year flow in Old Alamo Creek and downstream riparian vegetation. The two-year flow is typically identified as the channel-forming flow; significant increases in this flow rate can result in channel erosion and loss of riparian vegetation. Stormwater discharge shall be designed to avoid downstream channel impacts.

Significance After Mitigation: *Less than significant.*

3. Result in a substantial adverse effect on federally regulated wetlands as defined by Section 404 of the CWA and/or State protected wet-

lands as defined by the Porter-Cologne Water Quality Control Act through direct removal, filling, hydrological interruption, or other means.

Implementation of the proposed Brighton Landing Specific Plan would result in the loss of 0.13 acre of seasonal wetland habitat.

Wetlands were identified within the Brighton Landing Specific Plan area and verified by the Army Corps of Engineers (Corps) in 2006 and re-verified in 2011. These wetlands occur along the edge of Elmira Road (0.09 acre) and in a small area near the bottom portion of the Specific Plan area (0.04 acre). The locations of these wetlands are in areas that are likely to be filled, according to the Brighton Landing Specific Plan. This would include wetlands under the jurisdiction of the Corps and/or the RWQCB.

Because of historic and cumulative losses of wetlands, the loss of even degraded wetlands on the site would be considered a *significant* impact.

Impact BIO-11: Implementation of the proposed Brighton Landing Specific Plan would result in the loss of approximately 0.13 acre of jurisdictional wetland, which would be a *significant* impact.

Mitigation Measure BIO-11a: The Specific Plan proponent shall create an estimated 0.26 acres of seasonal wetland habitat (2:1 ratio). Actual mitigation acreage requirements shall be adjusted and determined based on a revised and Corps-verified wetland delineation, and shall be based on the verified wetland acreage and not just areas subject to Section 404 regulation. Mitigation may be accomplished by (1) on- or off-site creation of new seasonal wetlands at an appropriate mitigation site or (2) purchase of the appropriate number of credits at an agency-approved off-site mitigation bank. A credit purchase agreement or receipt shall be provided prior to approval of the grading plan.

If the mitigation is to be accomplished by creating new wetlands on-site (or at an off-site location owned or otherwise controlled by the appli-

cant), the applicant shall prepare and implement a wetland mitigation and monitoring plan (MMP) for approval by regulatory agencies and the City, and which details the mitigation design, the wetland planting design, maintenance and monitoring requirements, reporting requirements, long-term funding for management, and success criteria. Mitigation wetlands shall be monitored for a minimum of five years to verify that the success criteria have been achieved. The MMP shall be approved by the Corps, RWQCB and the City of Vacaville prior to approval of the Final Map.

Significance After Mitigation: *Less than significant.*

4. 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.

As discussed above, the proposed Specific Plan would potentially create a barrier to movement and dispersal of numerous wildlife species along the Old Alamo Creek corridor by filling 0.045 acres of creek channel. This would be a *significant* impact. This impact is described in Impact BIO-2, above. It would be mitigated to a *less than significant* level by Mitigation Measures BIO-2a, BIO-2b, and BIO-2c.

On a broader scale, development of the Brighton Landing Specific Plan would extend a finger of development eastward into current agricultural lands that provide a large contiguous block of habitat and relatively unobstructed movement for most wildlife. This would create a barrier to the broader north-south movement of wildlife. However, the long-term implications for regional wildlife north/south movement across the site are *less than significant* since the site is not within a designated, high-value landscape corridor.

5. Conflict with any applicable land use plans, policies, regulations, or ordinances, of an agency with jurisdiction over the project, adopted

for the purpose of protecting biological resources or avoiding and mitigating impacts to biological resources.

This section considers potential impacts from conflicts with plans, policies, regulations and ordinances at the federal, State, and local levels.

a. Federal and State regulations

Impact BIO-12: Implementation of the Specific Plan will impact wetlands, channel and riparian habitats, and habitat for State- and federally-listed threatened species regulated by multiple State and/or federal agencies. Non-compliance with these adopted regulations would constitute a significant impact.

Mitigation Measure BIO-12: The Specific Plan proponent shall provide copies of required permits, or verifiable statement that permits are not required, prior to receiving grading permits or other approvals that would permit land disturbing activities/conversion of habitats or impacts to protected species associated with Specific Plan implementation. Such agencies and permits include: U.S. Army Corps of Engineers (404 permit), Regional Water Quality Control Board (401 certification or WDR), California Department of Fish and Game (1602 Streambed Alteration Agreement, 2081 Individual Take Permit), and U.S. Fish and Wildlife Service (Section 7 Take Authorization).

Significance After Mitigation: *Less than significant.*

b. MBTA and State Fish and Game Code Section 3503

Birds nest in trees and on the ground in grasslands and grain crops. Heavy machinery removes trees and prepares the ground surface for the construction of Specific Plan developments. If the heavy machinery operates during the nesting season (generally March through August), nesting birds and/or their eggs could be harmed or killed. The federal MBTA and State Fish and Game Code Section 3503 prohibit the intentional killing of most native species of birds and the destruction of their eggs. The construction of the proposed

Brighton Landing Specific Plan could result in harm to nesting birds and their eggs, and this would be a *significant* impact.

Impact BIO-13: Implementation of the Specific Plan could result in significant impacts to nesting birds protected under the federal Migratory Bird Treaty Act and the California Fish and Game Code.

> Mitigation Measure BIO-13: To the extent feasible, vegetation removal activities shall occur during the non-nesting season (September 1 to January 31). For any construction activities conducted during the nesting season, Project Applicants are responsible for compliance with the federal Migratory Bird Treaty Act and the California Fish and Game Code. Project applicants shall submit affidavits to the City of Vacaville describing both their obligations and the measures undertaken to comply with these regulations.
>
> Significance After Mitigation: *Less than significant.*

c. Vacaville General Plan

Impact BIO-14: Development of the Brighton Landing Specific Plan would conflict with several Vacaville General Plan policies for preserving creek corridors and riparian vegetation, specifically policies 2.1-G3, 3.5-G3, 3.5-G4, 3.5-I6, 8.1-G1, 8.2-I1, and 8.2-I3.

> Mitigation Measure BIO-14: Implement Mitigation Measures BIO-2c, 10-b, and 10-c.
>
> Significance After Mitigation: *Less than significant.*

d. Vacaville Land Use and Development Code Section 14.09.131

The City of Vacaville regulates impacts to any tree greater than 31 inches in circumference at 4.5 feet above the ground. Trees meeting this size class occur in a few areas of the Brighton Landing Specific Plan area along roads, in the Riparian Area, and in the Developed Area. Protected trees provide habitat for

birds for nesting, roosting, and foraging. Protected trees are also notable because they provide a greater variety of habitats, due to their size, than smaller trees, and take a long time to attain these superior habitat values. Removal of these protected trees would reduce the biological value of the Brighton Landing Specific Plan area. The proposed Brighton Landing Specific Plan would result in a reduction in the number of protected trees. This would be a *significant* impact.

Impact BIO-15: Construction of the Specific Plan could result in damage to or removal of trees protected by the City of Vacaville, which would be a *significant* impact.

Mitigation Measure BIO-15a: The removal of protected trees shall be avoided by design where possible (see Mitigation Measures BIO-2c and BIO-10a). For each protected tree removed, three native trees such as valley oak, blue elderberry, or other suitable tree species, shall be established within common areas, such as landscaping areas and the park site. ("Established" shall mean growing for a minimum of three years without supplemental irrigation or other significant support, except for normal maintenance.) The mitigation trees shall be derived from local stock.

A mitigation plan shall be developed by a biologist or professional arborist in order to ensure the long-term survival of the native plantings and this plan shall be reviewed and approved by Planning Director of the City of Vacaville prior to implementation. The mitigation plan shall include details on the location of planting, planting techniques, the need for irrigation, monitoring, maintenance, performance standards, and annual reporting requirements. Monitoring shall be done for at least 5 years after planting or until establishment criteria are achieved.

Mitigation Measure BIO-15b: To mitigate potential damage to native trees on the site during construction, a tree protection zone (TPZ) shall be established on the site adjacent to the work area. Usually, a tree protection zone encompasses all areas within the edge of the tree canopy. A

professional arborist shall be consulted prior to construction regarding the specifications of the TPZ and the appropriate care for trees before, during, and after construction. Trees whose roots are damaged by implementation of the Specific Plan shall be monitored for 5 years after the end of construction. Those trees that die within the 5-year monitoring period shall be replaced with three native trees. These new replacement trees shall be covered by the mitigation plan described in Mitigation Measure BIO-12a.

Significance After Mitigation: *Less than significant.*

6. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan.

The Solano HCP, of which the City of Vacaville is a participant, has not yet been adopted. Nevertheless, appropriate mitigation measures have been adapted from the Solano HCP for the proposed Brighton Landing Specific Plan. This EIR is therefore consistent with the conservation actions of Solano HCP that can be implemented at this time. Thus, there is *no impact*.

E. Cumulative Impacts

The Brighton Landing Specific Plan, whether considered together with approved projects, under the existing 1990 General Plan, or with the Proposed General Plan Update, would result in the cumulative loss of foraging habitat for a number of special-status bird species within Solano County, including Swainson's hawk, burrowing owl, tricolored blackbird, loggerhead shrike, yellow-headed blackbird, short-eared owl, and northern harrier.

The Solano HCP anticipates conversion of an estimated 14,000 acres of current habitat, including agricultural lands, grassland, oak woodland, and riparian habitats to urban uses over the next 30 years. The Brighton Landing Specific Plan lies within the geographic area assumed for this future urban growth. In addition to the direct loss of habitat, new urban development in-

creases stormwater and wastewater discharges that alter the natural hydrology of the affected waterways and contribute to increased potential for establishment of invasive plant and animals in receiving waterways.

One of the major goals of the Solano HCP is to provide a comprehensive plan for addressing and mitigating the cumulative impacts of this anticipated development, including direct and indirect cumulative impacts. The mitigation measures recommended in the above *project* impact section are adapted from the Solano HCP and are intended to provide comparable mitigation to the HCP, at least to the extent that such measures can be practicably implemented by a single project without the HCP being fully implemented. With these mitigation measures, the cumulative impact to biological resources would be *less than significant*.

In addition to cumulative impacts on foraging habitat, implementation of the Brighton Landing Specific Plan project would contribute to cumulative impacts to Old Alamo Creek, which is considered riparian habitat and a wildlife movement corridor. Although various roads and other urban uses already fragment the Old Alamo Creek corridor, the remaining segments of the creek provide a corridor for the movement of terrestrial and aquatic wildlife along the creek and between urban areas and agricultural areas. Current development plans show undergrounding of approximately 283 feet (0.385 acre) of the creek corridor because of the Jepson Parkway Project in combination with implementation of the Brighton Landing Specific Plan. The Brighton Landing Specific Plan would be responsible for approximately 43 feet of this cumulative impact (.03 acre) on the north side of Elmira Road. The creek corridor and its riparian habitat would be replaced by a landscaped area and meandering sidewalk. The presence of humans and loss of the riparian vegetation and channel would impede or preclude wildlife from moving between remaining sections of Old Alamo Creek north of Elmira Road and west of Leisure Town Road. The gap between open channels would increase from one 40-foot road crossing across Elmira Road, plus a separate 70-foot crossing across Leisure Town Road, to a much longer 393-foot gap. This increased distance may not preclude movement, but would substantially impinge the

local movement of wildlife and likely result in an increase in road-kills of wildlife as they attempt to cross the roadways instead of using the creek corridor and existing shorter culverts. This represents a *significant* local impact on wildlife movement.

The cumulative effect of this loss of stream corridor will also conflict with General Plan Policies 2.1-G3, 3.5-G3, 3.5-G4, 3.5-I6, 8.1-G1, 8.2-I1, and 8.2-I3, and with the Solano HCP for preserving creek corridors and riparian vegetation.

Though not an environmental impact, implementation of the current Specific Plan would preclude the ability of the Jepson Parkway project to retain a movement corridor by realigning/relocating the channel and riparian habitat eastward in compliance with the Draft Solano HCP requirements.

Impact BIO-CUM-1: The cumulative effect of the Brighton Landing project as currently designed, together with the construction of Jepson Parkway, would result in the undergrounding of 283 feet of Old Alamo Creek in order to accommodate the widening and relocation of Leisure Town Road, the widening of Elmira Road, and the installation of landscaping and sidewalk proposed as part of the Brighton Landing Specific Plan. This will create a gap of approximately 393 feet between open sections of Old Alamo Creek and would significantly impact habitat for special status species such as Valley elderberry longhorn beetle as well as local movement of terrestrial and aquatic wildlife, including western pond turtle.

> Mitigation Measure BIO-CUM-1: Prior to a development application being submitted for development in Subarea O, the applicant shall prepare a site plan for Subarea O. The City shall ensure that this site plan allows for an adequate area to the east of the current Old Alamo Creek channel for the possible relocation (by the Jepson Parkway project) of the portions of Old Alamo Creek that would be impacted by the Jepson Parkway project. This area shall allow for the width of a potentially relocated channel of Old Alamo Creek to remain at least the width of the existing

channel, and for the slope of the bank to be less than the current slope, in order to increase bank stability. A Subarea O site plan must also allow for a 100-foot buffer between the riparian vegetation and any development, according to the provisions of the Solano HCP.[21]

After completion of the Jepson Parkway project adjacent to the Specific Plan Area, any portion of Subarea O that is not required to maintain a 100-foot buffer from riparian habitat would no longer be restricted by this mitigation measure. Also, in the event that Jepson Parkway is constructed prior to the submittal of a development application for Subarea O, a Subarea O applicant shall only be required to submit a land use plan that includes a 100-foot buffer from riparian habitat.

Implementation of this measure will not prevent the Jepson Parkway project from maintaining a movement corridor for western pond turtles, Valley elderberry longhorn beetle, and other species along Old Alamo Creek. In combination with the other mitigation measures in this chapter, this measure would mitigate for the Brighton Landing Specific Plan project's 43-foot contribution to the cumulative impact, since this distance does not in itself represent a significant impediment to wildlife movement.

Significance After Mitigation: Implementation of this mitigation measure and other mitigation measures in this chapter would mitigate the Brighton Landing Specific Plan's contribution to this cumulative impact to a *less-than-significant* level. However, the cumulative impact would remain significant because the possibility remains that the Jepson Parkway project will not relocate the Old Alamo Creek channel as mitigation for its impacts.

[21] Solano HCP, Chapter 6, Avoidance and Minimization Measure RSM 2: Setbacks and Buffer Zones.

4.5 CULTURAL RESOURCES

This section describes the cultural and paleontological resources setting, as well as plan-level and cumulative impacts and mitigation measures for the proposed Brighton Landing Specific Plan. Resources used to develop this chapter include historical research and a field survey.

A. Regulatory Framework

The California Environmental Quality Act (CEQA) requires that cultural resources be considered during the environmental review process. This is accomplished by completing an inventory of resources within a study area and by assessing the potential that cultural resources could be affected by development.

1. National Historic Preservation Act

The National Register of Historic Places (National Register) established by the National Historic Preservation Act of 1966 (NHPA), as amended, recognizes properties that are significant at local, State, and national levels. According to the NHPA, the following four areas of significance may qualify a property as eligible:

- Properties associated with events that have made a significant contribution to the broad patterns of our history.
- Properties associated with the lives of persons significant in our past.
- Properties that embody the distinctive characteristics of a type, period, or method of construction; that represent the work of a master; that possess high artistic values; or that represent a significant and distinguishable entity whose components may lack individual distinction.
- Properties that have yielded, or may be likely to yield, information important in prehistory or history.

In addition to meeting one or more of the four criteria listed above, a property must possess "integrity," defined as the ability to convey its significance.[1] Properties that are eligible for listing in the National Register are afforded the same protection given to properties that are listed in the National Register.

If a property is listed or eligible for listing, Section 106 of the NHPA requires agencies to consider the effects of their undertakings on that property before proceeding with actions that could affect the property through consultation. "The goal of consultation is to identify historic properties potentially affected by the undertaking, assess its effects, and seek ways to avoid, minimize, or mitigate any adverse effects on historic properties."[2] NHPA applies only to projects that are federally funded, regulated, or permitted.

2. State Laws and Regulations

This section summarizes State laws and regulations that apply to cultural and paleontological resources in the Brighton Landing site.

a. California Register of Historical Resources

California Code of Regulations Title 14, Chapter 11.5, Section 4850 creates the California Register of Historical Resources (California Register). The California Register is a guide to cultural resources that helps government agencies identify and evaluate California's historical resources[3] and identifies which properties are to be protected from substantial adverse change.[4]

The California Register was modeled after the National Register. The California Register's significance and integrity criteria for listing historical resources are consistent with those of the National Register. Any resource eli-

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[1] National Park Service, 1998. *National Register Bulletin: How to Apply the National Register Criteria for Evaluation.*

[2] Section 800.1(a) of Title 36 of the Code of Federal Regulations.

[3] California Office of Historic Preservation, 2001. *California Register of Historical Resources: Q&A for Local Governments,* Technical Assistance Series No. 4, Sacramento: California Department of Parks and Recreation, page 3.

[4] Public Resources Code (PRC) Section 5024.1(a).

gible for the National Register is also eligible for the California Register. According to the California Register, the following four types of cultural resources are determined to be historically significant:

- A resource that is associated with events that have made a significant contribution to the broad pattern of California's history and cultural heritage.
- A resource that is associated with the lives of persons important in our past.
- A resource that embodies the distinctive characteristics of a type, period, region, or method of construction; represents the work of an important creative individual; or possesses high artistic values.
- A resource that has yielded, or may be likely to yield, information important in prehistory or history.

The California Register also requires a resource to possess integrity, which is defined as "the authenticity of a historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association."[5] Integrity is relative to the specific significance that the resource conveys. For example, the integrity of archaeological deposits is judged according to the ability of a site to yield scientific and cultural information that can be used to address important research questions.[6]

The National Register criteria have been modified by the California Office of Historic Preservation to include a range of historical resources that better

[5] California Office of Historic Preservation, 2006. *California Register and National Register: A Comparison (for purposes of determining eligibility for the California Register),* Technical Assistance Series No. 6, Sacramento: California Department of Parks and Recreation, page 2.

[6] National Park Service, 2000. *Guidelines for Evaluating and Registering Archeological Properties*, Washington, D.C.: National Park Service, pages 35 to 42.

reflect the history of California.[7,8] There are three instances in which a resource not eligible for the National Register may be eligible for the California Register:

- Moved buildings, structures, or objects. A moved building, structure, or object that is otherwise eligible may be listed in the California Register if it was moved to prevent its demolition at its former location, and if the new location is compatible with the original character and use of the historical resource.
- Reconstructed buildings. A reconstructed building less than 50 years old may be eligible if it embodies traditional building methods and techniques that play an important role in a community's historically-rooted beliefs, customs, and practices (e.g. a Native American roundhouse).
- Historical resources achieving significance within the past 50 years. Resources less than 50 years old may be considered for listing in the California Register if it can be demonstrated that sufficient time has passed to develop a scholarly perspective on its historical importance.[9]

b. California Historic Property Directory

The California Historic Property Directory (HPD) is a list compiled by the California Office of Historic Preservation that contains information regarding a property with respect to the California Register of Historical Resources,

[7] California Office of Historic Preservation, 2001. *California State Law and Historic Preservation,* Technical Assistance Series No. 10, Sacramento: California Department of Parks and Recreation, pages 69 to 70.

[8] California Office of Historic Preservation, 2006. *California Register and National Register: A Comparison (for purposes of determining eligibility for the California Register),* Technical Assistance Series No. 6, Sacramento: California Department of Parks and Recreation, page 1.

[9] California Office of Historic Preservation, 2006. *California Register and National Register: A Comparison (for purposes of determining eligibility for the California Register),* Technical Assistance Series No. 6, Sacramento: California Department of Parks and Recreation, page 3.

California State Historical Landmarks, California State Points of Historical Interest, and the National Register of Historic Places.

c. Public Resources Code Section 5097.5

Public Resources Code Section 5097.5 prohibits excavation or removal of any "vertebrate paleontological site...or any other archaeological, paleontological or historical feature, situated on public lands, except with express permission of the public agency having jurisdiction over such lands." Public lands are defined to include lands owned by or under the jurisdiction of the State or any city, county, district, authority, or public corporation, or any agency thereof. The Code also states that any unauthorized disturbance or removal of archaeological, historical, or paleontological materials or sites located on public lands is a misdemeanor.

d. Government Code Section 65352.3

Government Code Section 65352.3 contains consultation and notice requirements for local governments, prior to making a decision to adopt or amend a general or specific plan, to consult with California Native American tribes identified by the Native American Heritage Commission (NAHC) for the purpose of protecting or mitigating impacts to cultural places. Although Government Code Section 65352.3 does not specifically mention these requirements applying to specific plans, existing law requires the same processes by local governments for adoption and amendment of specific plans as for general plans (Government Code Section 65453).

e. Health and Safety Code Section 7050.5

Health and Safety Code Section 7050.5 states that in the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the coroner of the county in which the remains are discovered has determined whether or not the remains are subject to the coroner's authority. If the human remains are of Native American origin, the coroner must notify NAHC within 24 hours of this identification. NAHC will then identify a Native

American Most Likely Descendant to inspect the site and provide recommendations for the proper treatment of the remains and associated grave goods.

f. State Historic Building Code

The State Historic Building Code provides alternative building regulations and building standards for the rehabilitation, preservation, restoration (including related reconstruction), or relocation of buildings or structures designated as historic buildings. These regulations are intended to facilitate the restoration or change of occupancy so as to preserve their original or restored architectural elements and features, to encourage energy conservation and enable a cost-effective approach to preservation, and to provide for the safety of the building occupants.

3. Local Regulations and Policies

This section summarizes local regulations and policies that apply to cultural and paleontological resources in Vacaville.

a. Vacaville General Plan

The City of Vacaville's 1990 General Plan contains guiding and implementing policies that are relevant to the cultural resources in the study area. These guiding and implementing policies occur in the Conservation Element and are presented in Table 4.5-1.

b. Vacaville Municipal Code

Chapter 14.09.105 of the City of Vacaville's Municipal Code establishes a Historic Preservation Overlay District that provides for the identification of historically-significant buildings and areas and the adoption of standards to ensure the preservation of these resources. The Historic Preservation Overlay District includes individual sites that contain historic buildings, as designated by the City of Vacaville, as well as multiple sites designated by the City of Vacaville as a historic district. The City's criteria for designating historic

TABLE 4.5-1 **VACAVILLE GENERAL PLAN CONSERVATION ELEMENT POLICIES RELEVANT TO CULTURAL AND PALEONTOLOGICAL RESOURCES**

Policy Number	Policy Content
Policy 8.5-G 1	Continue to protect historic sites and archaeological resources for their aesthetic, scientific, educational, and cultural values.
Policy 8.5-I 1	Working in conjunction with the California Archaeological Inventory, review each proposed development project to determine whether the site contains known prehistoric or historic cultural resources and/or to determine their potential for as-yet-undiscovered cultural resources.
Policy 8.5-I 2	Require that areas found to contain significant historic or prehistoric artifacts be examined by a qualified consulting archaeologist or historian for appropriate protection and preservation, if feasible.

Source: Vacaville General Plan, 2007.

buildings and districts pertain to the historical and cultural significance of the structure or district; the historic, architectural, and engineering significance of the structure or district; and the neighborhood and geographic setting of the structure or district.

The Municipal Code also establishes design standards for exterior alterations to designated historic buildings and sites, and prohibits the demolition of historic buildings unless specific findings are made by the Planning Commission.

B. Existing Conditions

This section first describes the cultural setting for the Specific Plan area, then describes archival research and field survey results, and concludes with a summary of potential cultural and paleontological resources on the Brighton Landing site.

1. Cultural Setting

a. Pre-Contact and Ethnographic Setting

This section describes the prehistory and ethnography of the Brighton Land site and vicinity.

i. Pre-Contact Background

Although the Sacramento Valley may have been inhabited by humans as early as 10,000 years ago, the evidence for early human use is likely deeply buried by alluvial sediments that accumulated rapidly during the late Holocene epoch.[10] Archaeological remains from this early period, though rare, have been found in and around the Central Valley, although to date none have been identified in Solano County. These early archaeological remains were grouped into what is called the Farmington Complex, which is characterized by core tools and large, reworked percussion flakes. It is generally thought that the economy of this early period was based on the exploitation of large game. Later periods are more understood than this period because of a better representation in the archaeological record.

Fredrickson[11] identified three general patterns of resource use for the period between 4500 years before present (B.P.) and the arrival of European Americans in California: the Windmiller, Berkeley, and Augustine patterns.

The Windmiller Pattern (4500 B.P. to 2500 B.P.) shows evidence of a mixed economy that relied on the procurement of game and plant foods. The archaeological record contains numerous projectile points and a wide range of faunal remains. Fishing was also an important activity, as evidenced by fish-

[10] Rosenthal, Jeffrey S., Gregory G. White, and Mark Q. Sutton, 2007. "The Central Valley: A View from the Catbird's Seat" in *California Prehistory: Colonization, Culture, and Complexity*, eds. Terry L. Jones and Kathryn A. Klar. Lanham, Maryland: AltaMira Press, pages 147 to 164.

[11] Fredrickson, David A., 1974. "Cultural Diversity in Early Central California: A View from the North Coast Ranges," *Journal of California Anthropology* 1(1): pages 41 to 54.

ing hooks and spears found in association with the remains of sturgeon, salmon, and other fish.

The Berkeley Pattern was superseded by the Augustine Pattern around A.D. 500 (1500 B.P.) and persisted into the ethnographic period. The Augustine Pattern reflects a change in subsistence and land use patterns to those of the ethnographically-known Patwin people of the historic era. This pattern exhibits a great elaboration of ceremonial and social organization, including the development of social stratification. Exchange became well developed, with an even more intensive emphasis on the use of the acorn, as evidenced by shaped mortars and pestles and numerous hopper mortars.

ii. Ethnographic Background

Vacaville was most likely settled by native Californians between 12,000 and 6,000 years ago. Penutian peoples, ancestors of the Patwin, migrated into central California around 4,500 years ago. When Europeans first entered central California, the area west of the Sacramento River and north of Suisun Bay was occupied by a series of linguistically and culturally related tribelets. These groups had no common name, but spoke dialects of the same historically-related language. This linguistic similarity led Powers in 1877 to call the groups "Patwin," a term each group used in reference to themselves. This section describes what is known about the way of life of the Patwin around the time of contact with Euro-American explorers and settlers.

The Patwin lands include all of present-day Vacaville; the village of Ululato was located along Ulatis Creek in present-day Downtown Vacaville. As with most of the hunting-gathering groups of California, the tribelet represented the basic social and political unit. Typically, a tribelet headman would reside in a major village where ceremonial events were often held. The position of tribelet headman was patrilineally inherited among the Patwin. Social organ-

ization among the Patwin was divided into three groupings based on familial ties: the paternal family, the family social group, and the household.[12]

Intensive Hispanic exploration and settlement of the Bay Area began in the late 18th century, and Patwin culture was radically transformed when European settlers moved into northern California. These settlers established the mission system and exposed the Patwin to diseases to which they had no immunity. Patwin from the Vacaville area were baptized at several missions in the Bay Area: Mission San Francisco de Asis (San Francisco) between 1815 and 1821, Mission San Francisco Solano (Sonoma) between 1823 and 1824, and Mission San Jose between 1826 and 1832.[13] Following the secularization of the missions in 1834, native peoples often moved to ranchos, where they worked as manual laborers.[14]

b. Historic Setting[15]

This section describes the historic-period setting of the Brighton Land site and vicinity.

By 1842, Manuel Vaca, Juan Felipe Peña, and their families arrived in the vicinity of the Brighton Landing Site.[16] Both families established temporary homes near the center of Lagoon Valley and Laguna Creek. Within one year,

[12] Johnson, Patti J., 1978. "Patwin," in *California*, ed. Robert F. Heizer, Volume 8 in *Handbook of North American Indians*, ed. William C. Sturtevant, Washington, D.C.: Smithsonian Institution, pages 350 to 369.

[13] Slaymaker, Charles, 1990. *Archaeological Augering of the Proposed Lower Lagoon Valley Drain Alignment, Vacaville, California: Site CA-SOL-30.* On file, Northwest Information Center, California Historical Resources Information System, Sonoma State University, Rohnert Park, California.

[14] Milliken, Randall, 1995. *A Time of Little Choice, The Disintegration of Tribal Culture in the San Francisco Bay Area 1769-1810*, Anthropological Papers No. 43, Menlo Park, California: Ballena Press, page 254.

[15] This section is adapted from *Cultural Resources Assessment of the Brighton Landing Project Area, Solano County, California* by Peak & Associates, 2008.

[16] Noske, Carole, Brian Irwin, and Vacaville Heritage Council, 2007. *Vacaville*, Charleston, South Carolina: Arcadia Publishing.

Vaca constructed a permanent adobe home nestled in the foothills of the Vaca Mountains near present-day Cherry Road, which would become a primary route to the Sacramento Valley. Peña built his small adobe residence approximately ⅓-mile southwest of Vaca's home.

The Brighton Landing Site lies immediately east of the eastern boundary of Rancho Los Putos, a 44,000-acre land grant issued to Vaca and Peña in 1845 by Governor Pio Pico. The land grant covered a large area, and there were troubles with squatters as well as trouble with the title to the grant, not formally recognized by the United States until 1856. The owner began selling off portions of the grant in 1849 to those interested in establishing ranches in the area.

Settlement in the vicinity of the Brighton Landing Site began in 1853, with several scattered families acquiring land for agricultural purposes. In 1859, there was a residence owned by "Rice" just outside of the Brighton Landing Site in the southwest quarter of section 24, and a bridge over the creek was located just north of the Rice house in the northwest quarter of section 24.

Nearby the Brighton Landing Site is Elmira, a community named for the city of Elmira, New York and previously known as Vaca Station. It was located at the junction of the California, Pacific, Vaca Valley, and Clear Lake railroads. The town was platted in 1868 on a 40-acre tract, and in 1878, there was a population of about 500 in the area.

In 1864, James Wells crossed the plains from Iowa to Solano County with his wife and two children. For two years, Wells rented land near Vacaville then moved to Dixon where he bought 320 acres of land for $1,400.00. A windstorm in 1867 caused heavy damage to his grain crops, forcing him to sell his land for $6,000.00. In 1868, he moved to Elmira, purchasing 160 acres, including the land that would become a portion of the Brighton Landing Site.

In 1870, Wells owned the 160-acre farm valued at $9,000.00. He had cattle, horses, and swine valued at $4,000.00; the previous year he had produced

1,400 bushels of wheat and 15 tons of hay. In 1878, his residence was located in the northeast corner of that land, surrounded by orchards.

In 1890, the lands that encompass the Brighton Landing Site were owned by Mrs. Accia Wells, James' widow. With the exception of 10 acres planted in alfalfa, the remainder of the property was planted in grain. Mrs. Wells continued to own the property as of 1915, but began leasing portions of it to tenants.

During World War II, the Vacaville region rebounded dramatically from the Great Depression.[17] Conveniently located along a major highway, with its proximity to the Bay Area and military installations, it provided a favorable community for war workers. With this upsurge in the economy and population came a wartime housing shortage that spurred growth in the region. New housing developments were constructed south and west of Vacaville, and by 1950 the town had nearly doubled its 1940 population.[18] Orchards gave way to urban expansion; by the end of the war, the fruit industry in Vacaville dwindled to a small percentage of the overall agricultural production of the county. Freeway reconstruction and expansion in the second half of the 20th century led to greater suburban development, including the construction of thousands of new homes, business parks, warehouses, and medical offices. As of 2009, Vacaville's population has reached nearly 100,000.[19]

2. Cultural and Paleontological Resources in the Specific Plan Area

a. Archival Research

To obtain information about cultural resources, a records search was conducted for the Specific Plan area on June 6, 2011, at the Northwest Infor-

[17] Noske, Carole, Brian Irwin, and Vacaville Heritage Council, 2007. *Vacaville*, Charleston, South Carolina: Arcadia Publishing.

[18] Gerike, Christian, Karin Goetter, and Alexandra Greenwald, 2009. *Archaeological Research Design: Lagoon Valley Policy Plan Implementation Project, Vacaville, Solano County, California,* Richmond, CA: LSA Associates, Inc.

[19] State of California, Department of Finance, 2009. *E-5 Population and Housing Estimates for Cities, Counties, and the State, 2001-2009, with 2000 Benchmark*.

mation Center (NWIC) of the California Historical Resources Information System, Sonoma State University, Rohnert Park, California. Cultural resources identified in the Brighton Landing site consist of built environment properties: two houses (one built in 1958, the other build date unknown) are on the parcel at 570 Leisure Town Road; and one house (built circa 1920) and associated outbuildings are on the parcel at 579 Leisure Town Road. Jones & Stokes recorded the buildings at 579 Leisure Town Road (State designation P-48-000745) and evaluated their historical significance as part of the Jepson Parkway Project EIR.[20] Jones & Stokes concluded that P-48-000745 is not eligible for inclusion in the National Register and does not qualify as a historical resource under CEQA. Access to the buildings at 570 Leisure Town Road was not available during the Jones and Stokes' technical studies; however, the observable traits of the houses suggested that they are typical examples of rural Solano County residential properties associated with agriculture. One of the buildings (listed as an "additional living unit" in Solano County Assessor records) appears to be older and consists of a T-shaped plan with a gabled cross wing and hipped-roof extension. No information was identified during background research linking the buildings at 570 Leisure Town Road to significant patterns of events, notable individuals in the past, or distinctive types or periods of construction. Although a formal eligibility evaluation could not be conducted due to lack of access, it is unlikely that the property at 570 Leisure Town Road would qualify as a historical resource under CEQA.

The records search indicated that approximately 40 percent of the Brighton Landing site has been previously studied for cultural resources through background research and field survey. Chavez (1981) surveyed approximately the western one-third of the Brighton Landing site, while Peak and Associates (2008) surveyed two narrow strips along Elmira Road.

[20] Bowen, M., 2002. *Historical Resources Evaluation Report for the Jepson Parkway Project*, Jones & Stokes, Sacramento, California. Note that the Jepson Parkway Project has been approved and the EIR/EIS certified. No impacts were found to identified Cultural Resources.

LSA contacted the Native American Heritage Commission (NAHC) in Sacramento on May 19, 2010, and requested a search of the Sacred Land File for an area that encompassed the Brighton Landing site. No Native American cultural resources were identified in the immediate vicinity of the Brighton Landing Site by the NAHC.[21]

LSA contacted the University of California Museum of Paleontology (UCMP) in Berkeley on May 17, 2010, and requested a fossil locality search for an area that encompassed the Brighton Landing site. No recorded fossil localities were identified.[22] Based on LSA's background research, the geological formations underlying the Brighton Landing site consist of Holocene Alluvium and Pleistocene Alluvium. Holocene Alluvium (Recent to 10,000 years old) consists of sand, silt, and gravel deposited in fan, valley fill, terrace, or basin environments. This unit is typically in smooth, flat valley bottoms, in medium-sized drainages, and in other areas where the terrain allows a thin veneer of this alluvium to deposit.[23] These alluvial deposits may contain vertebrate and invertebrate fossils of extant, modern taxa,[24] which are generally not considered paleontologically significant.[25] Pleistocene Alluvium (10,000 to 2.6 million years old) consists of less-permeable basin, terrace, or riverbank deposits found at a distance from the present-day course of the Sacramento

[21] Debbie Pilas-Treadway, Environmental Specialist III, NAHC. Letter faxed to LSA, May 29, 2010.

[22] Patricia Holroyd. Email to LSA, April 10, 2010.

[23] Graymer, R.W., D.L. Jones, and E.E. Brabb, 2002. *Geologic Map and Map Database of Northeastern San Francisco Bay Region, California; Most of Solano County and Parts of Napa, Marin, Contra Costa, San Joaquin, Sacramento, Yolo, and Sonoma Counties,* U.S. Geological Survey Miscellaneous Field Studies Map MF-2403, Menlo Park, CA: U.S. Geological Survey.

[24] Helley, E.J, et al, 1979. *Flatland Deposits of the San Francisco Bay Region - Their Geology and Engineering Properties, and Their Importance to Comprehensive Planning,* Geological Survey Professional Paper 943, Washington, D.C.: U.S. Geological Survey and Department of Housing and Urban Development.

[25] Society of Vertebrate Paleontology, 2007. *Policy Statements*, http://www.vertpaleo.org/society/polstatconformimpactmigig.cfm, accessed on May 24, 2010.

River. Vertebrate fossils found in Late Pleistocene alluvium are representative of the Rancholabrean land mammal age, from which many taxa are now extinct,[26] and include, but are not limited to, bison, mammoth, ground sloths, saber-toothed cats, dire wolves, cave bears, rodents, birds, reptiles, and amphibians.[27] These alluvial deposits are therefore considered highly sensitive for paleontological resources.

b. Field Survey

On June 16, 20-21, and 24, 2011, LSA archaeologists surveyed portions of the Brighton Landing site, including the detention basin, that were not previously surveyed (excluding those unsurveyed portions of 570 and 579 Leisure Town Road due to lack of access). Overall ground visibility was excellent. No cultural resources were identified during the survey.

C. Standards of Significance

The Specific Plan would have a significant impact on cultural resources if it would:

1. Cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines §15064.5.
2. Cause a substantial adverse change in the significance of an archaeological resource as pursuant to CEQA Guidelines §15064.5.
3. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

[26] Bell, C.J., et al, 2004. "The Blancan, Irvingtonian, and Rancholabrean Mammal Ages," in *Late Cretaceous and Cenozoic Mammals of North America*, ed. M.O. Woodburne, New York: Columbia University Press, pages 232 to 314.

[27] Bell, C.J., et al, 2004. "The Blancan, Irvingtonian, and Rancholabrean Mammal Ages," in *Late Cretaceous and Cenozoic Mammals of North America*, ed. M.O. Woodburne, New York: Columbia University Press, pages 232 to 314.

4. Disturb any human remains, including those interred outside of formal cemeteries.

D. Impact Discussion

The Specific Plan calls for the development of 769 single-family detached homes of moderate- to low-density; a 50-acre high school campus and a reservation for an 11-acre elementary school; a six-acre park; an agricultural buffer; three miles of bike/pedestrian paths; one major and two minor collector roads; residential streets; and a 17.6-acre detention basin. To support these land uses, the Specific Plan will require storm water, sanitary sewer, electrical, and other utility construction.

The primary potential cause of impacts to cultural resources would be ground disturbance resulting from construction. Such construction activities would likely involve grading for residential homes and parks, trenching for utility installation, and excavation for the detention pond. These activities have the potential to disturb archaeological deposits, human remains, or paleontological resources. A secondary source of potential impacts would be the demolition of the existing buildings in the northwestern portion of the Brighton Landing site. A final potential impact scenario involves the introduction of a large number of residential buildings that could introduce a visual intrusion on a formerly open landscape of agricultural fields and pastures and potentially affecting the cultural context of any historic resources.

1. Cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines §15064.5.

Historical resources, as defined at Public Resources Code (PRC) Section 21084.1, can consist of archaeological, architectural, or traditional cultural properties. There is no evidence from background research that traditional cultural properties are subject to impact as the result of the project. Therefore, the discussion that follows is divided in archaeological and architectural impacts.

a. Archaeological Impacts

The Specific Plan calls for a large amount of ground-disturbing construction. Such construction has the potential to encounter archaeological deposits, either prehistoric or historical, that have not been previously identified; it is not uncommon for archaeological deposits to exist entirely underground beneath a layer of non-cultural sediments, thereby remaining obscured from view on the ground surface. The proximity of Alamo Creek indicates an elevated sensitivity for prehistoric archaeological deposits to the Brighton Landing site due to the occurrence of these resources along other similar waterways in Solano County. These deposits would qualify as historical resources under PRC Section 21084.1 if they are eligible for inclusion in the California Register. The most common way an archaeological deposit is eligible is by qualifying under Criterion 4 of the California Register, which is the ability to yield, or the potential to yield, information important in prehistory or history. Should a deposit so qualify, construction activity that disturbs or destroys the deposit would create a substantial adverse change in the significance of the deposit. A substantial adverse change would occur if the activity materially impairs (i.e. disturbs or destroys) the characteristics of the deposit that convey and justify its significance. A substantial adverse change in a historical resource would result in a significant impact under CEQA.

No archaeological deposits were identified during field survey or previous study of the Brighton Landing site. However, because archaeological deposits can remain obscured, and because older buildings were present in the Brighton Landing site near the intersection of Leisure Town and Elmira roads, there is the potential that historical deposits associated with buried features such as privy pits or building foundations could persist. It is also possible that prehistoric archaeological deposits associated with Native American habitation and use of the Brighton Landing site could occur and be encountered during construction. Destruction of archaeological deposits that could meet the definition of historical resources would be a *significant* impact.

Impact CULT-1: Specific Plan implementation has the potential to result in the disturbance or destruction of archaeological deposits. These deposits could qualify as historical or unique archaeological resources under CEQA.

Mitigation Measure CULT-1: If deposits of prehistoric or historical archaeological materials are encountered during Specific Plan activities, all work within 25 feet of the discovery shall be redirected until an archaeologist is contracted to assess the finds, consult with agencies and descendant communities (as appropriate), and make recommendations for the treatment of the discovery. If preservation in place is not feasible, the archaeologist shall evaluate the deposit for its eligibility for listing in the California Register of Historical Resources. If the deposit is not eligible, mitigation is not necessary. If the deposit is eligible, impacts to the deposit shall be mitigated. Mitigation shall include excavation of the archaeological deposit in accordance with a data recovery plan (see *CEQA Guidelines* Section 15126.4(b)(3)(C)). The City of Vacaville shall ensure that descendant communities are consulted for their input and concerns during the development and implementation of any mitigation plan.

Upon completion of the evaluation and/or mitigation, the report shall be submitted to the City of Vacaville, the applicant, the Northwest Information Center at Sonoma State University, and descendant communities.

Significance After Mitigation: Upon the completion of all phases of Mitigation Measure CULT-1, this impact will be reduced to a *less-than-significant* level due to the avoidance of impact (preservation) or the recovery of scientifically consequential information that would otherwise be lost if the deposit were disturbed or destroyed.

b. Architectural Impacts

The Specific Plan could change the land use designation of Area O in the northwestern corner of the Specific Plan area, although there are no current development plans for this area and the Applicant does not own the properties. The consequences of a land use change for these parcels are being con-

sidered in this EIR to ensure that the maximum impact scenario is evaluated. This would affect buildings in parcels at 570 and 579 Leisure Town Road (State designation P-48-000745).

P-48-000745, the buildings at 579 Leisure Town Road, does not appear eligible for inclusion in the National Register and do not qualify as a historical resource under CEQA. Although not formally evaluated due to lack of access, background research did not identify evidence that the buildings at 570 Leisure Town Road are associated with significant events, notable persons, or distinctive architecture. They are not likely to be eligible for inclusion in the National Register or California Register, or to qualify as historical resources under CEQA. Due to the demonstrated and putative lack of significance of the buildings in the Specific Plan area, even if Area O were to be developed at some time in the future, this would not result in impacts to buildings or structures that meet the definition of historical resources and there would be *no impact*.

The Specific Plan calls for alteration of agricultural fields that once characterized the landscape that encompasses the Brighton Landing site. Such rural landscape values often define and justify the eligibility of agriculture-based buildings and structures that draw part of their significance from their functional association with open fields and farming operations. For that reason, if the implementation of the project, which will effect a conversion of the existing character of the Brighton Landing site, would alter the aspects of setting, feeling, and association of an architectural property that qualified as a historical resource, that alteration could constitute a substantial adverse change. However, the proximity of the encroaching suburbs of Vacaville immediately east of Leisure Town Road has already introduced a substantial suburban landscape element. As such, any change to the landscape character that might occur as the result of the Specific Plan would be affecting a setting that is already compromised by the intrusion of previous development. For this reason, any impact to existing buildings or structures that qualify as historical resources would be *less than significant*.

Overall, there would be a *less-than-significant* impact to historical resources.

2. Cause a substantial adverse change in the significance of an archaeological resource as pursuant to CEQA Guidelines §15064.5.

If a cultural resource subject to impact is an archaeological deposit, *CEQA Guidelines* Section 15064.5(c)(1) requires that the lead agency first determine if the deposit is a historical resource as defined at PRC Section 21084.1. If the deposit qualifies as a historical resource, potential adverse impacts to the resource must be considered as outlined at *CEQA Guidelines* Section 15064.5. If the archaeological deposit does not qualify as a historical resource but does qualify as a unique archaeological site, then the archaeological site is treated in accordance with PRC Section 21083.2. In practice, most archaeological deposits that meet the definition of a unique archaeological resource will also (and first) meet the definition of a historical resource.

The Specific Plan calls for a large amount of ground-disturbing construction. Such construction has the potential to encounter archaeological deposits, either prehistoric or historical, that have not been previously identified. These deposits could qualify as archaeological resources under PRC Section 21083.2. Should a deposit so qualify, construction activity that disturbs or destroys the deposit would create a substantial adverse change in the significance of the deposit. A substantial adverse change would occur if the activity materially impairs (i.e., disturbs or destroys) the characteristics of the deposit that convey and justify its significance. A substantial adverse change in a unique archaeological resource would result in a significant impact under CEQA.

No archaeological deposits were identified during field survey or previous study of the Brighton Landing site. However, there is the potential that historical or prehistoric deposits could persist. For these reasons, this analysis must acknowledge the possibility that impacts to archaeological deposits that could meet the definition of unique archaeological resources could occur and their destruction would be a *significant* impact.

Impact CULT-2: Specific Plan implementation has the potential to result in the disturbance or destruction of unique archaeological resources.

Mitigation Measure CULT-2: See Mitigation Measure CULT-1.

Significance After Mitigation: Upon the completion of all phases of Mitigation Measure CULT-1, this impact will be reduced to a *less-than-significant* level due to the avoidance of impact (preservation) or the recovery of scientifically consequential information that would otherwise be lost if the deposit were disturbed or destroyed.

3. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

LSA contacted the UCMP and requested a fossil locality search for an area that encompassed the Brighton Landing site and were informed that the Specific Plan area does not contain recorded fossil localities. The geological formations underlying the Brighton Landing site consist of Holocene Alluvium and Pleistocene Alluvium. Holocene Alluvium may contain vertebrate and invertebrate fossils of extant, modern taxa, which are generally not considered paleontologically significant. Pleistocene Alluvium may contain vertebrate fossils representative of the Rancholabrean land mammal age that are regarded as scientifically valuable. The area is therefore regarded as highly sensitive for paleontological resources.

Although no paleontological resources were identified in the Brighton Landing site, there is the potential, given the nature of the underlying formations, that Specific Plan excavation to depth may encounter such resources. The disturbance or destruction of significant paleontological resources would result in a *significant* impact.

Impact CULT-3: Specific Plan implementation has the potential to result in the disturbance or destruction of paleontological resources that could occur in the sensitive formations underlying the Brighton Landing site. Such disturbance would be considered a significant impact under CEQA.

Mitigation Measure CULT-3: If paleontological resources are encountered during Specific Plan activities, all ground-disturbing activities within 25 feet shall be stopped and a qualified paleontologist contacted to assess the situation, consult with agencies as appropriate, and make recommendations for the treatment of the discovery (including, as appropriate, data recovery).

Significance After Mitigation: Upon the completion of Mitigation Measure CULT-3, this impact will be reduced to a *less-than-significant* level due to the avoidance of impact (preservation) or the recovery of scientifically consequential information that would otherwise be lost if the paleontological resource were disturbed or destroyed.

4. Disturb any human remains, including those interred outside of formal cemeteries.

Human remains are often associated with archaeological sites, especially those that are prehistoric in nature. No archaeological deposits were identified during field survey or previous study of the Brighton Landing site. However, because archaeological deposits can remain obscured, there is the potential that archaeological deposits could persist. Prehistoric archaeological deposits in the vicinity of Vacaville have been known to contain mortuary components consisting of one or more human burials. F or these reasons, this analysis must acknowledge the possible disturbance of human remains, which would be a *significant* impact under CEQA.

Impact CULT-4: Specific Plan implementation has the potential to result in the disturbance of human remains, including those interred outside of formal cemeteries. Such disturbance would be considered a significant impact under CEQA.

Mitigation Measure CULT-4: If human remains are encountered during Specific Plan activities, all ground-disturbing activities within 25 feet should be redirected. The remains shall be treated in accordance with the provisions of California Health and Safety Code Section 7050.5.

Significance after Mitigation: Upon the completion of Mitigation Measure CULT-4, this impact will be reduced to a *less-than-significant* level due to the treatment of human remains in a respectful manner with the input and recommendations of descendant community representatives.

E. Cumulative Impacts

It is not anticipated that significant impacts to cultural or paleontological resources would occur as the result of Specific Plan implementation. No known historical or unique archaeological resources, paleontological resources, or human remains would be impacted by the Specific Plan; the potential impact scenarios have a low likelihood of occurring. Therefore, the likelihood of a similar cumulatively considerable impact occurring is minimal, whether considered with approved projects, under the existing 1990 General Plan, or with the Proposed General Plan Update.

4.6 GEOLOGY, SOILS, AND MINERAL RESOURCES

This chapter describes the existing geologic, soil, and mineral resource conditions of the proposed Specific Plan area and evaluates the potential impacts to and from these resources and conditions. This chapter also includes a discussion of cumulative impacts to geology, soils, and mineral resources.

A. Regulatory Framework

1. State Laws and Regulations

a. Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act was passed by the California Legislature in 1972 to mitigate the hazard of surface rupture to structures. The Act's main purpose is to prevent the construction of buildings used for human occupancy on the surface trace of active faults. The Act addresses only the hazard of surface fault rupture and is not directed toward other earthquake hazards. According to the Act, local agencies must regulate development in fault zones established by the State Geologist. Before a project can be permitted in a designated Alquist-Priolo Earthquake Fault Zone, the City or County with jurisdiction must require a geologic investigation to demonstrate that proposed buildings would not be constructed across active faults.[1]

b. California Seismic Hazards Mapping Act

The California Seismic Hazards Mapping Act of 1990 (California Public Resources Code Sections 2690 through 2699.6) addresses seismic hazards other than surface fault rupture, including liquefaction and seismically-induced landslides. The Seismic Hazards Mapping Act specifies that the Lead Agency for a project may withhold development permits until geologic or soils investigations are conducted for specific sites and mitigation measures to reduce

[1] California Department of Conservation's website, http://www.consrv.ca.gov/cgs/rghm/ap/Pages/index.aspx, accessed on March 16, 2011.

hazards associated with seismicity and unstable soils are incorporated into project plans.[2]

c. California Building Code

The California Code of Regulations (CCR), Title 24, is also known as the California Building Standards Code. The California Building Standards Code combines three types of building standards from three different origins:

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

Part 2 of Title 24 is the California Building Code (CBC), which is based on the 2006 International Building Code. The International Building Code was developed by the International Conference of Building Officials to provide a set of consistent standards for building structures. The Code requires strict building standards for essential facilities and structures on soft soil where potential shaking intensities from earthquakes are high.

Division 14.20 of the City of Vacaville Municipal Code adopts the 2010 CBC as the building code for the City.

[2] California Department of Conservation's website, http://www.consrv.ca.gov/CGS/shzp/Pages/article10.aspx, accessed on March 16, 2011.

2. Local Policies and Regulations

a. Vacaville 1990 General Plan

The 1990 General Plan contains several goals and policies relevant to geology and soils. Goals and policies relevant to the Specific Plan are listed in Table 4.6-1.

b. Vacaville Municipal Code

There are several references to geology and soils in the City of Vacaville's Municipal Code. Standards required of developers for public improvements are set forth in Section 14.12.176. Section 14.26.030 adopts the Stormwater Management Plan's Best Management Practices, including erosion control measures. Additionally, Section 14.26.030 grants the Public Works Director the authority to require monitoring and analysis reports from any person engaged in an activity, or owning or operating a facility which in some way may contribute to stormwater pollution (for example, resulting from erosion or loss of topsoil). There are also standards establishing appropriate grading methods and requiring erosion control measures in Section 14.19.244. Finally, the Code stipulates in Section 14.11.152.010 that preliminary geologic and seismic safety reports must be submitted with a tentative map, if the Specific Plan is within a geologic or seismic hazard area, or in a hillside area.

B. Existing Conditions

This section includes comprehensive analysis of the geotechnical conditions and soil resources located in the Specific Plan area.

1. Regional Seismicity

Vacaville is vulnerable to seismic activity with several prehistoric earthquake faults within several miles. Vacaville experienced a magnitude 6.4 earthquake on April 19, 1891, which caused structural damage in Vacaville and surrounding towns.[3]

[3] USGS Earthquake Hazards Program, http://earthquake.usgs.gov/earthquakes/states/events/1892_04_19.php, accessed on December 28, 2011.

TABLE 4.6-1 **CITY OF VACAVILLE 1990 GENERAL PLAN POLICIES RELEVANT TO GEOLOGY**

Policy Number	Policy
Safety Element	
Policy 9.1-G1	Investigate and mitigate geologic and seismic hazards or locate development away from such hazards in order to preserve life and protect property.
Policy 9.1-G2	Require financial protection for public agencies and individuals as a condition of development approval where geologic conditions indicate a potential for high maintenance costs.
Policy 9.1-G3	Give primary consideration to geologic conditions in the selection of land use and in the design of development in Vacaville. Retain high-risk areas in low occupancy or open forms of use where potential risks are unmitigable.
Policy 9.1-I2	Analyze proposed development sites at the earliest stage of the detailed planning process to determine geologic suitability. The analysis should include the structural engineering for the actual site and possible impacts of the project on adjacent lands.
Policy 9.1-I3	Require geotechnical studies prior to approval of rezoning, specific plans, or subdivision maps in areas of low damage susceptibility designated 2 through 4 and areas of high damage susceptibility as shown on the Relative Susceptibility to Landsliding Map (Figure 9-1 [in 2010 General Plan]) within a quarter-mile of a known fault. Require comprehensive geologic and engineering studies of critical structures regardless of location.
Policy 9.1-I4	To the extent practicable, do not allow critical facilities, structures involving high occupancies, and public facilities to be sited in areas of high damage susceptibility. Where such location is deemed essential to the public welfare, these structures will be sited, designed and constructed with due consideration of the potential for earthquake damage due to ground shaking, associated ground deformation, seismically triggered flooding, liquefaction and landslide.
Policy 9.1-I6	Appoint a registered engineering geologist to be available at the discretion of the City Engineer to review reports submitted by applicants.
Policy 9.1-I7	Do not locate structures intended for human occupancy over an active fault or potentially active trace. To the extent practical, do not locate such structures over the trace of an inactive fault. Allow roads to be built over active faults only where alternatives are impractical.

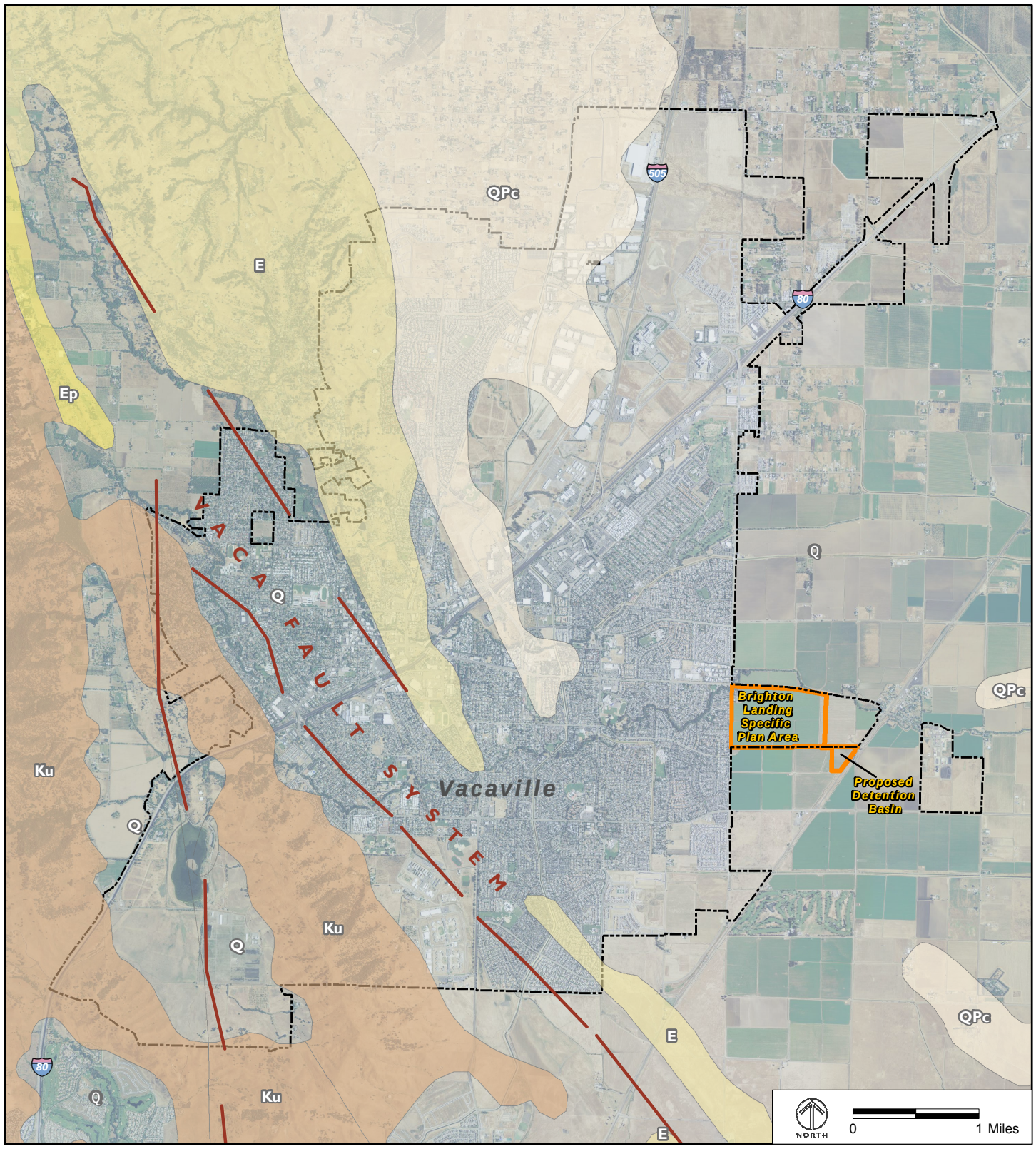
Policy Number	Policy
Policy 9.1-I8	Establish setbacks from active and potentially active fault traces for structures intended for human occupancy.
Policy 9.1-I9	Require preparation of a soils report prior to issuing a building permit, except where the Building Official determines that a report is not needed.
Policy 9.1-I12	Consider forming geological hazard abatement districts or other methods to abate geologic hazards prior to development approval, where appropriate, to ensure that geotechnical mitigation measures are maintained over the long term, and that financial risks are equitably shared among owners and not borne by the City of Vacaville.
Policy 9.1-I13	Evaluate the feasibility of implementing a hazard reduction program for existing development in high-risk zones. This would include inspection of structures for conformance with the Building Code giving priority for inspection to emergency and critical facilities, older structures and public facilities.

Source: City of Vacaville, *Vacaville General Plan*, 1990.

The Vaca fault zone contains several faults, northwest-southeast trending, running along the base of hills (Coast Ranges) east of the Specific Plan area; however, the USGS indicates that none of these have been active in the past 11,700 years.[4,5] The closest of these faults run approximately 4 miles from the Specific Plan area as shown in Figure 4.6-1. The Kirby Hills Fault lies approximately 6 miles to the south of Vacaville; however, there is no evidence for displacement along this fault during the last 700,000 years. The Green Valley Fault system, which lies 12 miles to the southwest of Vacaville, has been active within the past 200 years. While more likely than either of the two previous faults to have seismic impacts on Vacaville, the USGS estimates the probability of a magnitude 6.7 or greater earthquake along this fault prior

[4] USGS California Quaternary Faults, http://geohazards.usgs.gov/qfaults/ca/California.php, accessed on December 28, 2011.

[5] USGS 2010 Fault Activity Map of California, http://www.quake.ca.gov/gmaps/FAM/faultactivitymap.html, accessed on February 2, 2012.



Source: NAIP 2009, City of Vacaville, U.S. and Califonia Geological Surveys and The Planning Center | DC&E.

E - Paleocene to Oligocene Mudstone

Ep - Paleocene Sandstone

Ku - Late Cretaceous Sandstone

Q - Pliocene to Holocene Alluvium

QPc - Milcene to Pliocene Sandstone

Faults

City Limits

FIGURE 4.6-1

SOLID GEOLOGY AND FAULTS

to 2036 to be only 3 percent. The Rogers Creek Fault, part of the Hayward Fault System, lies roughly 24 miles to the southwest of Vacaville and has an estimated 16 percent probability of producing a magnitude 6.7 or greater earthquake prior to 2036.[6]

There are no Alquist-Priolo Special Study Zones within Vacaville, although there are several in western Solano County.[7] Regionally, the Green Valley and Cordelia fault zones to the southwest of Vacaville near Fairfield include Alquist Priolo Study Zones.[8]

Ground shaking from an earthquake has the potential to produce various types of ground failure, including liquefaction, settlement, lateral spreading, lurch cracking, and earthquake-induced landslides. Landslides are discussed in section B.4 and liquefaction is discussed in section B.2. The other three phenomena are described in greater detail below:

- Settlement or subsidence refers to the compaction of soils and alluvium as a result of ground shaking. Compaction typically occurs in places that are underlain by soft, water-saturated, low-density alluvial material.
- Lurch cracking refers to fractures, cracks, and fissures stemming from ground shaking, settling, compaction of soil, and sliding. Lurch cracking may occur many miles from an earthquake's epicenter. The potential for lurch cracking is greatest in areas where the water table is high.
- Lateral spreading is the horizontal movement or spreading of soil toward a stream bank, the open side of a fill embankment, the side of a levee, or another open face. Areas most likely to be affected are artificial fill areas

[6] USGS, 2008 Earthquake Probabilities, http://earthquake.usgs.gov/regional/nca/ucerf/, accessed on February 2, 2012.

[7] California Department of Conservation, "Alquist-Priolo Earthquake Fault Zone Maps," http://www.quake.ca.gov/gmaps/ap/ap_maps.htm, accessed on December 28, 2011.

[8] USGS California Quaternary Faults, http://geohazards.usgs.gov/qfaults/ca/California.php, accessed on December 28, 2011.

that were not properly engineered or that have steep and unstable embankments.

2. Liquefaction

Liquefaction refers to the loss of soil strength resulting from shaking of water-saturated, granular soils. This weakening of the soil can make the soil act like quicksand.

Hazards can be reduced by avoiding development on the soils most prone to liquefaction and by designing building foundations and utilities to withstand liquefaction. According to the 1990 General Plan, the Specific Plan area is divided between areas of moderate and low susceptibility to liquefaction.[9] The moderate susceptibility areas run along the western and eastern portions of the Specific Plan area, while the low susceptibility area is located in the central portion of the Specific Plan area.[10]

3. Geology and Soils

Located on the western edge of the California Central Valley, the Specific Plan area is entirely composed of Younger Alluvium likely deposited during the Holocene period.[11]

The Solano County Safety Element map classifies most of Solano County as having soils with a high shrink-swell potential, which would indicate that expansive soils could be present.[12] However, more detailed soil mapping of the Specific Plan area by the U.S. Department of Agriculture (USDA) has

[9] City of Vacaville, 2007. *General Plan*, Figure 9-2 Vacaville Liquefaction Potential.

[10] City of Vacaville, 2007. *General Plan*, Figure 9-2 Vacaville Liquefaction Potential.

[11] California Department of Conservation, "Geologic Map of the Sacramento Quadrangle," http://www.quake.ca.gov/gmaps/RGM/sacramento/sacramento.html, accessed on December 28, 2011.

[12] Solano County, 2008. *Solano County Safety Element*, Figure HS-7, page HS-31.

categorized five basic soils found in the Specific Plan area: Brentwood clay loam, Capay silty clay loam, Rincon clay loam, San Ysidro sandy loam, and Yolo loam.[13,14] As these soils are loams, which contain approximately equal proportions of sand, silt, and clay, they are not notably expansive. Figure 4.6-2 shows the location and types of soils within the Specific Plan area.

4. Landslides

Landslides are the rapid movement of soil, rock, and rock debris down a slope. The risk for landslides usually increases when a number of factors are present. These factors include steep slopes where extensive grading or vegetation removal has occurred, weak or shallow soils, water saturation, and active earthquake faults. Given that the Specific Plan area is essentially flat, with a grade ranging from zero to two percent, the likelihood of landsliding and slumping is low. The Specific Plan area is considered a "Least Susceptible Area" to landslides, as mapped in the City's 1990 General Plan.[15]

Old Alamo Creek runs along the northwest corner of the Specific Plan area. Although its banks are relatively steep, the area will be regraded and the creek culverted as part of the Jepson Parkway Project, eliminating the risk of landsliding in this area. The Jepson Parkway Project is anticipated to be complete before this portion of the Specific Plan area is developed.

C. Standards of Significance

Implementation of the Specific Plan would have significant impacts in regard to Geology and soils if implementation of the Specific Plan would:

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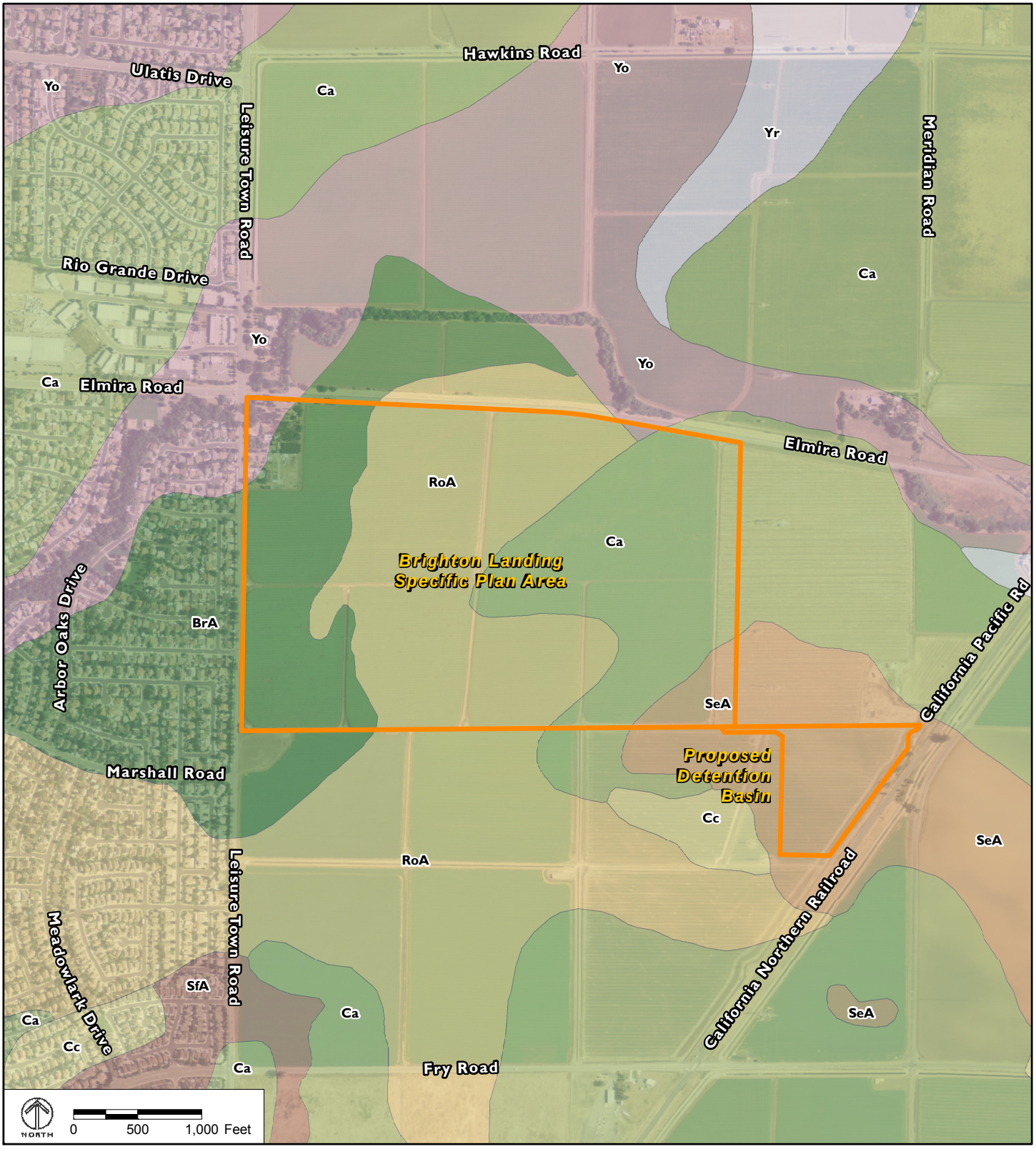
[13] U.S. Department of Agriculture Natural Resources Conservation Service, "Web Soil Survey," http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx, accessed on December 28, 2011.

[14] A loam is a soil with approximately equal proportions of sand, clay, and silt.

[15] City of Vacaville, 2007. *General Plan*, Figure 9-1 Vacaville – Relative Susceptibility to landsliding.



Source: NAIP 2009, City of Vacaville, U.S. Department of Agriculture and The Planning Center | DC&E.

- BrA - Brentwood Clay Loam
- Ca - Capay Silty Clay Loam
- Cc - Capay Clay
- RoA - Rincon Clay Loam
- SeA - San Ysidro Sandy Loam
- SfA - San Ysidro Sandy Loam, Think Surface
- Yo - Yolo Loam
- Yr - Yolo Loam, Clay Substratum

FIGURE 4.6-2
SOILS

1. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
    a. 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.
    b. Strong seismic ground shaking.
    c. Seismic-related ground failure, including liquefaction.
    d. Landslides.
2. Result in substantial soil erosion or the loss of topsoil.
3. 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.
4. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code, creating substantial risks to life or property.
5. 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.

D. Project Impacts

This section analyzes potential geological and soil impacts for the Specific Plan area. This discussion is organized by and responds to each of the potential impacts identified in the Standards of Significance.

1. Exposure of people or structures to the risk of loss, injury, or death involving rupture of a known earthquake fault, strong seismic ground shaking, or seismic-related ground failure or landslides.

The Specific Plan would have a significant environmental impact if it would expose people or structures to major geological hazards, including rupture of

a known earthquake fault, strong seismic ground shaking, seismic-related ground failure, or landslides.

a. Rupture of a Known Earthquake Fault

The Vaca fault zone – of which the closest fault trace is four miles from the Specific Plan area – has not been active within historic time. There are no other known active faults in the site vicinity and there would be a *less-than-significant* impact from potential surface rupture of faults.

b. Strong Seismic Ground Shaking

An earthquake of moderate to high magnitude generated within Solano County or the surrounding region could cause considerable ground shaking in the Specific Plan area. The effects of earthquake-related ground shaking could include possible damage to structures, changes in groundwater levels, and damage to streets and utilities.

New construction of proposed structures must be designed to meet the 2010 CBC requirements at a minimum, taking into consideration the proposed use of the structures to be built. Based on these requirements, structures should be able to: (1) resist minor earthquakes without damage, (2) resist moderate earthquakes without structural damage but with some nonstructural damage, and (3) resist major earthquakes without collapse but with some structural as well as nonstructural damage. In addition, General Policy 9.1-I2 requires analysis of the structural engineering of projects to determine geologic suitability. Also, Policy 9.1-I3 requires comprehensive engineering studies of all critical structures, regardless of proximity to a fault. As a result of building code requirements and the aforementioned policies, the impacts of potential ground shaking would be *less than significant.*

c. Seismic-Related Ground Failure, Including Liquefaction

According to the 1990 General Plan, the Specific Plan area has areas of moderate and low susceptibility to liquefaction. 1990 General Plan Policy 9.1-I9 requires the preparation of a soils report, while Policy 9.1-I6 requires that a registered engineering geologist be made available by the City to review such

reports. In addition, General Plan Policy 9.1-I2 requires analysis of the structural engineering of projects to determine geologic suitability. Providing these policies are followed during the City's review process, and structures built to the requirements of the 2010 CBC, there would be a *less-than-significant* impact from potential liquefaction.

d. Landslides

With the exception of Old Alamo Creek, the Specific Plan area is flat, with a slope ranging from zero to two percent, and the Specific Plan area is therefore not considered susceptible to landslides.[16] The Specific Plan would not alter the area around Old Alamo Creek.[17] The impact from landslide potential would be *less than significant.*

2. Result in substantial soil erosion or the loss of topsoil.

The Specific Plan would have a significant environmental impact if it would cause substantial soil erosion or loss of topsoil, which would hinder proper drainage and stormwater management. Erosion control, particularly during grading, is necessary to avoid downstream sedimentation and flooding. Typically, erosion impacts are greatest in the first two years after construction, the time generally required to reestablish a good vegetation cover on areas of disturbed soil. New construction activities could result in the loss of topsoil and the creation of erosion from development on the site; [18] therefore, there would be a *significant* impact.

[16] City of Vacaville, 2007. *General Plan*, Figure 9-1 Vacaville – Relative Susceptibility to landsliding.

[17] This area of Old Alamo Creek would be regraded as part of the Jepson Parkway project.

[18] City of Vacaville Park Planning staff have noted that past development of new park sites leads to the loss of topsoil as land is scraped and soil compacted under urban development during subdivision grading activities. This results in the need to import new soil or intensively condition the remaining substandard soil when the new park is built.

Impact GEO-1: Construction of the proposed project may result in the substantial erosion of soil or loss of topsoil.

Mitigation Measure GEO-1: The Specific Plan shall be required to comply with the City's Stormwater Management Plan Best Management Practices (BMPs) included in the City's Municipal Code to control erosion. The BMPs are intended to prevent, mitigate, and address potential stormwater pollutants such as entrained soil. Additionally, there are grading standards describing particular erosion control techniques in Section 14.19.244 of the Code. To prevent the loss of topsoil in the proposed park areas of the project site, adequate existing topsoil shall be stockpiled during grading activities for future use on park and other open space lands within the Specific Plan area.

Significance After Mitigation: Compliance with these existing requirements would reduce potential impacts from erosion and the loss of topsoil to a *less-than-significant* level.

3. 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.

Due to the lack of significant topography in the Specific Plan area, lateral spreading is not likely. Any required excavation for new development in the Specific Plan area would follow policies and regulations set forth in Vacaville's 1990 General Plan and Municipal Code. There are no other known causes of instability in the subsurface and there would be a *less-than-significant* impact.

4. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code, creating substantial risks to life or property.

The Specific Plan would have a significant environmental impact if it would locate people or structures on expansive soils. Expansive soils undergo a significant volume change as a result of wetting or drying, and this volume

change can cause damage to improperly designed foundations and pavements. Detailed soil mapping of the area by the USDA has shown that the site has loam soils that are not notably expansive. The impact from construction on loam soils would be *less than significant.*

5. 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.

The Specific Plan would construct a wastewater collection system connecting to the Easterly Wastewater Treatment Plant. No septic tanks or alternative wastewater disposal systems would be required to serve new development. Therefore, there would be *no impact*.

E. Cumulative Impacts

The Specific Plan would bring more residents and students into Vacaville, an area vulnerable to seismic activity, than there would be without it. Together, with approved projects under the 1990 General Plan, or with the Proposed General Plan Update, it would add cumulatively to the overall population growth and development in this seismically active region. However, the application of the relevant, required engineering standards found in the CBC and the City's Code is considered sufficient to reduce the cumulative risk to residents and other occupants of Vacaville to a *less-than-significant* level. Other potential geotechnical impacts of the proposed Specific Plan would not extend beyond the boundaries of the Specific Plan site. The Specific Plan, in combination with other known development projects and plans in Vacaville and the surrounding region would not therefore cause any significant cumulative impacts related to soils and geology.

4.7 GREENHOUSE GAS EMISSIONS

This chapter describes existing greenhouse gas (GHG) emissions in Vacaville and evaluates the potential climate change impacts associated with the Specific Plan. This chapter also includes a discussion of cumulative impacts associated with climate change.

A. Regulatory Framework

1. Federal Laws and Regulations

Currently there are no adopted regulations to combat global climate change on a national level. On April 2, 2007, the United States Supreme Court ruled that the U.S. Environmental Protection Agency (EPA) has the authority to regulate carbon dioxide (CO2) emissions under the Federal Clean Air Act.

After a thorough examination of the scientific evidence and careful consideration of public comments, the EPA announced on December 7, 2009, that GHG emissions threaten the public health and welfare of the American people. The EPA also finds that GHG emissions from on-road vehicles contribute to that threat. The EPA's final findings respond to the 2007 U.S. Supreme Court decision that GHG emissions fit within the Clean Air Act definition of air pollutants. The findings do not in and of themselves impose any emission reduction requirements, but allow the EPA to finalize the GHG standards proposed in 2009 for new light-duty vehicles as part of the joint rulemaking with the Department of Transportation.

The EPA's endangerment finding covers emissions of six key GHGs—CO2, methane (CH4), nitrous oxide (N2O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (SF6)—that have been the subject of scrutiny and intense analysis for decades by scientists in the U.S. and around the world.

In response to the endangerment finding, the EPA issued the Mandatory Reporting of GHG Rule that requires substantial emitters of GHG emissions (e.g. large stationary sources, etc.) to report GHG emissions data. Facilities that emit more the 25,000 metric tons (MTons) or more per year are required to submit annual report.

2. State Laws and Regulations

a. AB 32, the Global Warming Solutions Act

Current State of California guidance and goals for reductions in GHG emissions are generally embodied in AB 32, the Global Warming Solutions Act, and Executive Order S-03-05.

AB 32 was passed by the California State legislature on August 31, 2006, to place the State on a course toward reducing its contribution of GHG emissions. AB 32 follows the 2020 tier of emissions reduction targets established in Executive Order S-03-05, signed June 1, 2005. Executive Order S-03-05 set the following GHG reduction targets for the State:

- 2000 levels by 2010
- 1990 levels by 2020
- 80 percent below 1990 levels by 2050

AB 32 directed the California Air Resources Board (CARB) to adopt discrete early action measures to reduce GHG emissions and outline additional reduction measures to meet the 2020 target. Based on the GHG emissions inventory conducted for the Scoping Plan by CARB, GHG emissions in California by 2020 are anticipated to be approximately 596 million metric tons (MMTons). In December 2007, CARB approved a 2020 emissions limit of 427 MMTons for the State. The 2020 target requires emissions reductions of 169 MMTons, 28.5 percent of the projected emissions compared to business-as-usual (BAU) in year 2020 (i.e. 28.5 percent of 596 MMTons).

In order to effectively implement the cap, AB 32 directed CARB to establish a mandatory reporting system to track and monitor global warming emissions levels for large stationary sources that generate more than 25,000 MTons per year, prepare a plan demonstrating how the 2020 deadline can be met, and develop appropriate regulations and programs to implement the plan by 2012. The Climate Action Registry Reporting Online Tool was established through the Climate Action Registry to track GHG emissions. The final Scoping Plan was adopted by CARB on December 11, 2008. Key elements of CARB's GHG reduction plan are:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving 33 percent of energy generation from renewable sources;
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system for large stationary sources;
- Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets;
- Adopting and implementing measures pursuant to state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard (LCFS);
- Creating target fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the state's long-term commitment to AB 32 implementation.

Table 4.7-1 shows the proposed reductions from regulations and programs outlined in the Scoping Plan. While local government operations were not accounted for in achieving the 2020 emissions reduction, CARB estimates that land use changes implemented by local governments that integrate jobs, housing, and services are estimated to result in a reduction of 5 MMTons, which is approximately 3 percent of the 2020 GHG emissions reduction goal. In recognition of the critical role local governments plays in successful implementation of AB 32, CARB is recommending GHG reduction goals of 15 percent of today's levels by 2020 to ensure that municipal and community-wide emissions match the state's reduction target. Measures that local governments take to support shifts in land use patterns are anticipated to emphasize compact, low-impact growth in infill sites, over development in greenfield sites on the city edges, resulting in fewer VMT.

TABLE 4.7-1 **SCOPING PLAN GREENHOUSE GAS REDUCTION MEASURES AND REDUCTIONS TOWARD 2020 TARGET**

Recommended Reduction Measures	Reductions Counted Toward 2020 Target of 169 MMT CO2e	Percentage of Statewide 2020 Target
Cap and Trade Program and Associated Measures		
California Light-Duty Vehicle GHG Standards	31.7	19%
Energy Efficiency	26.3	16%
Renewable Portfolio Standard (33 percent by 2020)	21.3	13%
Low Carbon Fuel Standard	15	9%
Regional Transportation-Related GHG Targets1	5	3%
Vehicle Efficiency Measures	4.5	3%
Goods Movement	3.7	2%
Million Solar Roofs	2.1	1%
Medium/Heavy Duty Vehicles	1.4	1%
High Speed Rail	1.0	1%
Industrial Measures	0.3	0%
Additional Reduction Necessary to Achieve Cap	34.4	20%
Total Cap and Trade Program Reductions	146.7	87%
Uncapped Sources/Sectors Measures		
High Global Warming Potential Gas Measures	20.2	12%
Sustainable Forests	5	3%
Industrial Measures (for sources not covered under cap and trade program)	1.1	1%
Recycling and Waste (landfill methane capture)	1	1%
Total Uncapped Sources/Sectors Reductions	27.3	16%
Total Reductions Counted toward 2020 Target	174	100%

Recommended Reduction Measures	Reductions Counted Toward 2020 Target of 169 MMT CO_2e	Percentage of Statewide 2020 Target
Other Recommended Measures – Not Counted toward 2020 Target		
State Government Operations	1.0 to 2.0	1%
Local Government Operations	To Be Determined	NA
Green Buildings	26	15%
Recycling and Waste	9	5%
Water Sector Measures	4.8	3%
Methane Capture at Large Dairies	1	1%
Total Other Recommended Measures – Not Counted toward 2020 Target	42.8	NA

Notes: The percentages in the right-hand column add up to more than 100 percent because the emissions reduction goal is 169 MMTons and the Scoping Plan identifies 174 MMTons of emissions reductions strategies.
MMTCO_2e: million metric tons of CO_2e (carbon dioxide equivalent)
Reductions represent an estimate of what may be achieved from local land use changes. It is not the SB 375 regional target.
Source: California Air Resources Board (CARB, 2008. Climate Change Proposed Scoping Plan, a Framework for Change).

b. Energy Conservation Standards

Energy conservation standards for new residential and nonresidential buildings were adopted by the California Energy Resources Conservation and Development Commission in June 1977 and most recently revised in 2008 (Title 24, Part 6 of the California Code of Regulations [CCR]). Title 24 requires the design of building shells and building components to conserve energy. The standards are updated periodically to allow for consideration and possible incorporation of new energy efficiency technologies and methods. The 2006 Appliance Efficiency Regulations (Title 20, CCR Sections 1601 through 1608) were adopted by the California Energy Commission on October 11, 2006,

and approved by the California Office of Administrative Law on December 14, 2006. The regulations include standards for both federally regulated appliances and non-federally regulated appliances. While these regulations are now often viewed as "business-as-usual," they exceed the standards imposed by all other states and they reduce GHG emissions by reducing energy demand.

On July 17, 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (proposed Part 11, Title 24) was adopted as part of the California Building Standards Code (Title 24, California Code of Regulations). The green building standards that became mandatory in the 2010 edition of the code established voluntary standards on planning and design for sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and internal air contaminants. The mandatory provisions of the California Green Building Code Standards became effective January 1, 2011.

c. Renewable Power Requirements

A major component of California's Renewable Energy Program is the renewable portfolio standard (RPS) established under Senate Bills 1078 (Sher) and 107 (Simitian). Under the RPS, certain retail sellers of electricity were required to increase the amount of renewable energy each year by at least 1 percent in order to reach at least 20 percent by December 30, 2010. CARB has now approved an even higher goal of 33 percent by 2020. Renewable sources of electricity include wind, small hydropower, solar, geothermal, biomass, and biogas. The increase in renewable sources for electricity production will decrease indirect GHG emissions from development projects because electricity production from renewable sources is generally considered carbon neutral.

d. Vehicle Emission Standards/Improved Fuel Economy

Vehicle GHG emission standards were enacted under AB 1493 (Pavley I) and the Low Carbon Fuel Standard (LCFS). Pavley I is a clean-car standard that reduces GHG emissions from new passenger vehicles (light duty auto to me-

dium duty vehicles) from 2009 through 2016 and is anticipated to reduce GHG emissions from new passenger vehicles by 30 percent in 2016. The LCFS requires a reduction of 2.5 percent in the carbon intensity of California's transportation fuels by 2015 and a reduction of at least 10 percent by 2020.

3. Regulation of GHG Emissions on a Regional Level

In 2008, Senate Bill 375 (SB 375), Sustainable Communities and Climate Protection Act, was adopted to connect the GHG emissions reductions targets established in the Scoping Plan for the transportation sector to local land use decisions that affect travel behavior. Its intent is to reduce GHG emissions from light-duty trucks and automobiles (excludes emissions associated with goods movement) by aligning regional long-range transportation plans, investments, and housing allocations to local land use planning to reduce VMT and vehicle trips. Specifically, SB 375 required CARB to establish GHG emissions reduction targets for each of the 17 regions in California managed by a metropolitan planning organization (MPO). The Metropolitan Transportation Commission (MTC) is the MPO for the nine-county San Francisco Bay Area region, including Solano County and Vacaville. MTC's targets are a 7 percent reduction from 2005 by 2020, and 15 percent reduction from 2005 by 2035.

MTC's strategies are based on separate land use, road-pricing options (e.g. tolls and high-occupancy vehicle toll lanes), and maintenance policy options as well as the potential reductions from combining these policies. MTC's 2035 targets might be achieved through a more focused growth strategy and greater reliance on road pricing. MTC's current plan builds on the regional plan, FOCUS, which identified approximately 120 Priority Development Areas (PDAs) to focus the region's future growth, including a PDA in Downtown Vacaville. FOCUS, a regional development and conservation strategy, promotes a more compact land use pattern for the Bay Area and unifies the four regional agencies (the Association of Bay Area Governments [ABAG], the Bay Area Air Quality Management District [BAAQMD], Bay Conservation and Development Commission [BCDC], and the MTC) into a single

program that links land use and transportation by encouraging the development of complete, livable communities in areas served by transit, and promotes conservation of the region's most significant resource lands. FOCUS is partially funded by a Blueprint Planning Program Grant from the State of California Business, Transportation, and Housing Agency. The plan also includes investments of more than 80 percent of MTC's revenues into maintaining and operating the region's existing transportation network, build-out of high occupancy vehicle lanes, conversion of express high occupancy toll lanes, completion of several transit projects, ferry system expansion, region wide ramp metering, and completion of a regional bicycle network.

SB 375 requires the MPOs to prepare a Sustainable Communities Strategy (SCS) in their regional transportation plan. The SCS sets forth a development pattern for the region, which, when integrated with the transportation network and other transportation measures and policies, would reduce GHG emissions from transportation (excluding goods movement). The SCS is meant to provide individual jurisdictions with growth strategies that, when taken together, achieve the regional GHG emissions reduction targets. However, the SCS does not require that local general plans, specific plans, or zoning be consistent with the SCS, but provides incentives for consistency for governments and developers. If the SCS is unable to achieve the regional GHG emissions reduction targets, the MPO is required to prepare an Alternative Planning Strategy that shows how the GHG emissions reduction target could be achieved through other development patterns, infrastructure, and/or transportation measures. For the MTC region, the first SCS is anticipated by April 2013.

Though the Brighton Landing Specific Plan and the city of Vacaville fall within the Yolo-Solano Air Quality Management District (YSAQMD), YSAQMD is in the process of developing significance thresholds for GHG. In the interim, the YSAQMD will consult with applicants and lead agencies to identify thresholds of significance for GHG that have been adopted by other agencies and may be appropriate for use by the Specific Plan. For this

particular Specific Plan, YSAQMD has stipulated that the standards of the Bay Area Air Quality Management District (BAAQMD) should be applied.[1,2]

4. Qualified Climate Action or Sustainability Plans

Climate Action Plans address and seek to reduce GHG emissions in accordance with State goals. Under policies set forth by BAAQMD, municipalities may create a qualified Climate Action Plan, which allows future developments to potentially "tier" off the Plan. BAAQMD permits this tiering consistent with the State CEQA Guidelines, Section 15183.5, which reads, in part:

> *(a) Lead agencies may analyze and mitigate the significant effects of greenhouse gas emissions at a programmatic level, such as in a general plan, a long range development plan, or a separate plan to reduce greenhouse gas emissions. Later project-specific environmental documents may tier from and/or incorporate by reference that existing programmatic review.*
>
> *(b) Plans for the Reduction of Greenhouse Gas Emissions. Public agencies may choose to analyze and mitigate significant greenhouse gas emissions in a plan for the reduction of greenhouse gas emissions or similar document… a lead agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project complies with the requirements in a previously adopted plan or mitigation program under specified circumstances.*

Put simply, tiering means that, for the purpose of analyzing greenhouse gas impacts, projects that conform to the General Plan and the Climate Action Plan may simply refer to the GHG analyses presented in those plans and as-

[1] Jones, Matt. Supervising Air Quality Planner, Yolo Solano Air Quality Management District. Personal communication with Aaron Engstrom, The Planning Center | DC&E. January 18, 2012.

[2] Jones, Matt. Supervising Air Quality Planner, Yolo Solano Air Quality Management District. Personal communication with Aaron Engstrom, The Planning Center | DC&E. February 3, 2012.

sume a *less-than-significant* impact on GHG emissions. Conformity is then determined by an individual project's compliance with the policies and ordinances enacted under the qualified Climate Action Plan.

5. Local Regulations and Policies

Vacaville has no local regulations or policies that regulate GHGs.

B. Existing Conditions

The earth's atmosphere contains a group of naturally occurring gases that are responsible for maintaining a habitable climate. These gases allow sunlight to enter the earth's atmosphere freely and then prevent a portion of the resulting heat from exiting the atmosphere. Because of their ability to contain heat, these gases are known as greenhouse gases, or GHGs. Natural levels of GHGs exist in balanced proportion, resulting in steady maintenance of the temperature within earth's atmosphere. Emissions from human activities, such as electricity production and motor vehicle use, elevate the concentrations of GHGs, upsetting their natural balance. When GHG concentrations exceed natural concentrations in the atmosphere, the "greenhouse effect" of trapped heat is enhanced, and the phenomenon known as global warming occurs.

1. Greenhouse Gases

The natural process through which heat is retained in the troposphere is called the "greenhouse effect." The greenhouse effect traps heat in the troposphere, the lowest portion of Earth's atmosphere, through a three-fold process, as follows: short wave radiation emitted by the Sun is absorbed by the Earth; the Earth emits a portion of this energy in the form of long wave radiation; GHGs in the upper atmosphere absorb this long wave radiation and emit some of it back toward the Earth. This "trapping" of the long wave (thermal) radiation emitted back toward the Earth is the underlying process of the greenhouse effect.

California State law defines GHGs to include the following: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and nitrogen trifluoride.[3] Table 4.7-2 below shows the various global warming potentials and atmospheric lifetimes of the GHGs likely to be emitted in significant quantities as a consequence of this Specific Plan.

- *Carbon dioxide (CO_2)* enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees, and wood products; through respiration; and also as a result of other chemical reactions. Carbon dioxide is also removed from the atmosphere (sequestered) when it is absorbed by plants as part of the biological carbon cycle.
- *Methane (CH_4)* is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices, as well as from the decay of organic matter, including waste in municipal landfills and water treatment facilities.
- *Nitrous oxide (N_2O)* is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.

2. Human Influence on Climate Change

For approximately 1,000 years before the Industrial Revolution, the amount of GHG in the atmosphere remained relatively constant. During the 20th century, however, scientists observed rapid change in the climate and in the atmospheric levels of climate-change pollutants that are attributable to human activities. The amount of atmospheric CO_2 has increased by more than 35 percent since preindustrial times and has increased at an average rate of 1.4 parts per million (ppm) per year since 1960, mainly due to combustion of fossil fuels and to deforestation.[4] These recent changes in climate change pollutants far exceed the extremes of the ice ages, and the global mean temperature is warming at a rate that cannot be explained by natural causes alone.

[3] Health and Safety Code, Section 38505(g).

[4] Intergovernmental Panel on Climate Change (IPCC), 2007. Fourth Assessment Report: Climate Change 2007. New York: Cambridge University Press.

TABLE 4.7-2 **GREENHOUSE GASES AND THEIR RELATIVE GLOBAL WARMING POTENTIAL COMPARED TO CO_2**[5]

GHGs	Atmospheric Lifetime (Years)	Global Warming Potential Relative to CO_2[a]
Carbon Dioxide (CO_2)	50 to 200	1
Methane (CH_4)[b]	12 (±3)	21
Nitrous Oxide (N_2O)	120	310

[a] Based on 100-Year Time Horizon of the Global Warming Potential (GWP) of the air pollutant relative to CO_2.

[b] The methane GWP includes the direct effects and those indirect effects due to the production of tropospheric ozone and stratospheric water vapor. The indirect effect due to the production of CO_2 is not included.

Source: United States Environmental Protection Agency (EPA), 2009. Global Warming Potentials and Atmospheric Lifetimes. Non-CO_2 Gases Economic Analysis and Inventory. http://www.epa.gov/climatechange/glossary.html#GWP.

Human activities are directly altering the chemical composition of the atmosphere through the buildup of climate change pollutants.[6]

3. California's GHG Sources and Relative Contribution

California is the second largest emitter of GHG in the United States, only surpassed by Texas, and the tenth largest GHG emitter in the world.[7] However, because of more stringent air emission regulations, in 2001 California ranked fourth lowest in carbon emissions per capita and fifth lowest among

[5] Global Warming Potential is a factor by which a particular gas would increase the trapping of radiant heat and increase the greenhouse effect, by comparison with carbon dioxide.

[6] California Climate Action Team (CAT), 2006. Climate Action Team Report to Governor Schwarzenegger and the Legislature.

[7] California Energy Commission (CEC), 2005. Climate Change Emissions Estimates from Bemis, Gerry and Jennifer Allen, Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2002 Update. California Energy Commission Staff Paper CEC-600-2005-025. Sacramento, California.

states in CO_2 emissions from fossil fuel consumption per unit of Gross State Product (total economic output of goods and services). In 2004, California produced 492 MMTons of CO_2-equivalent (CO_2e) GHG emissions,[8] of which 81 percent were CO_2 from the combustion of fossil fuels, 2.8 percent were from other sources of CO_2, 5.7 percent were from methane, and 6.8 percent were from N_2O. The remaining 2.9 percent of GHG emissions were from high global warming potential gases, which include hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.[9]

CO_2 emissions from human activities make up 84 percent of California's total GHG emissions. California's transportation sector is the single largest generator of GHG emissions, producing 40.7 percent of the state's total emissions. Electricity consumption is the second largest source, comprising 22.2 percent. Industrial activities are California's third largest source of GHG emissions, generating 20.5 percent of state's total emissions. Other major sources of GHG emissions include mineral production, waste combustion, and land use and forestry changes. Agriculture, forestry, commercial, and residential activities make up the balance of California's GHG emissions.[10]

4. Potential Climate Change Impacts for California

Climate change is not a local environmental impact; it is a global impact with local implications. Unlike criteria pollutants, CO_2 emissions cannot be attributed to a direct health effect. However, human-caused increases in GHG have been shown to be highly correlated with increases in the surface and

[8] CO_2-equivalence is used to show the relative potential that different GHGs have to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. The global warming potential of a GHG, is also dependent on the lifetime, or persistence, of the gas molecule in the atmosphere.

[9] California Energy Commission (CEC), 2006. Inventory of California Greenhouse Gas Emissions and Sinks 1990 to 2004. Report CEC-600-2006-013-SF.

[10] California Energy Commission (CEC), 2006. Inventory of California Greenhouse Gas Emissions and Sinks 1990 to 2004. Report CEC-600-2006-013-SF.

ocean temperatures on Earth.[11] The extent of the impact on environmental systems, however, is less clear.

In California and western North America, climate observations have indicated: 1) a trend toward warmer winter and spring temperatures; 2) a decreasing fraction of precipitation is falling as snow; 3) diminished spring snow accumulation in the lower and middle elevation mountain zones; 4) snowmelt occurring 5 to 30 days earlier in the springs; and 5) a similar shift (5 to 30 days earlier) in the timing of spring flower blooms.[12]

The Intergovernmental Panel on Climate Change's (IPCC) 2007 IPCC Fourth Assessment Report projects that the global mean temperature increase from 1990 to 2100, under different climate-change scenarios, will range from 1.4 to 5.8°C (2.5 to 10.4°F). In the past, gradual changes in the earth's temperature changed the distribution of species, availability of water, and other environmental characteristics. However, human activities are accelerating this process so that environmental impacts associated with climate change no longer occur in a geologic timeframe but within a human lifetime.[13]

Like the variability in the projections of the expected increase in global surface temperatures, the environmental consequences of gradual changes in the Earth's temperature are also hard to predict. According to the California Energy Commission's (CEC) 2008 report, The Future Is Now, An Update on Climate Change Science, Impacts, and Response Options for California, global climate change risks (shown in Table 4.7-3) include: public health impacts, water resources impacts, agricultural impacts, disruption of native ecosystems, altered landscapes, increased wildfire risk, accelerated rises in sea level, forestry impacts, and growing energy demand.

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[11] Intergovernmental Panel on Climate Change (IPCC), 2007. Fourth Assessment Report: Climate Change 2007. New York: Cambridge University Press.

[12] California Climate Action Team (CAT), 2006. Climate Action Team Report to Governor Schwarzenegger and the Legislature.

[13] Intergovernmental Panel on Climate Change (IPCC), 2007. Fourth Assessment Report: Climate Change 2007. New York: Cambridge University Press.

TABLE 4.7-3 **SUMMARY OF CLIMATE CHANGE RISKS TO CALIFORNIA**

Impact Category	Potential Risk
Public Health Impacts	Poor air quality made worse More severe heat
Water Resources Impacts	Decreasing Sierra Nevada snow pack Challenges in securing adequate water supply Potential reduction in hydropower Loss of winter recreation
Agricultural Impacts	Increasing threats from pests and pathogens Declining productivity Irregular blooms and harvests
Ecosystem Impacts	Northward and upward shifts of biomes, species Altered timing of migration and mating habits Loss of sensitive or slow-moving species
Landscape Alteration	Movement of forest areas Conversion of forest to grassland Changes to water bodies
Wildfire Risk	Increased risk and severity of wildfire Lengthening of wildfire season
Coast Sea Level Impacts	Accelerated sea level rise Increasing coastal floods Worsened impacts on infrastructure
Forestry Impacts	Increasing wildfires Increasing threats from pest and pathogens Declining forest productivity Shifting vegetation and species distribution
Energy Demand Impacts	Potential reduction in hydropower Increased energy demand

Sources: California Energy Commission (CEC), The Future Is Now, An Update on Climate Change Science, Impacts, and Response Options for California, 2008 Report, PIER Publications, CEC-500-2008-077, 2008. California Climate Action Team (CAT), Climate Action Team Report to Governor Schwarzenegger and the Legislature, March 2006.

According to the California Climate Action Team (CAT), even if actions could be taken to immediately curtail climate change emissions, the potency of emissions that have already built up, their long atmospheric lifetimes, and the inertia of the Earth's climate system could produce as much as 0.6°C

(1.1°F) of additional warming. Consequently, some impacts from climate change are now considered unavoidable.

5. Local and Regional Emissions

a. Bay Area Emissions

The Bay Area Air Quality Management District (BAAQMD) established a climate protection program in 2005 to acknowledge the link between climate change and air quality. The BAAQMD regularly prepares inventories of criteria and toxic air pollutants to support planning, regulatory, and other programs. The most recent BAAQMD inventory also estimates GHG emissions produced by the San Francisco Bay Area in 2007.[14] The inventory updates BAAQMD's previous GHG emission inventory for base year 2002, which was published November 2006.

In 2007, the San Francisco Bay Area emitted 102.6 MMT of CO_2eq. Fossil fuel consumption in the transportation sector was the single largest source of the San Francisco Bay Area's GHG emissions. The transportation sector, including on-road motor vehicles, locomotives, ships and boats, and aircraft, contributed over 40 percent of GHG emissions in the Bay Area. The industrial and commercial sector (excluding electricity and agriculture) was the second largest contributor with 34 percent of total GHG emissions. Energy production activities such as electricity generation and co-generation were the third largest contributor with approximately 15 percent of the total GHG emissions. Off-road equipment such as construction, industrial, commercial, and lawn and garden equipment contributed 3 percent of GHG emissions.

b. Vacaville Emissions[15]

In 2011, the Solano Transportation Authority (STA) inventoried baseline GHG emissions that occurred in 2005 for unincorporated Solano County and the incorporated cities in Solano County: Dixon, Fairfield, Rio Vista, Suisun

[14] Bay Area Air Quality Management District, 2008, *Source Inventory of Bay Area Greenhouse Gas Emissions.*

[15] Information in this section from: The Planning Center | DC&E, *Greenhouse Gas Emissions Technical Memorandum*, 2011.

City, and Vacaville. STA inventoried GHG emissions for the following sectors: energy consumption (electricity and natural gas), transportation, solid waste, wastewater treatment, potable (i.e. drinking) water, industrial stationary sources, and miscellaneous sources. This inventory provides a baseline against which to measure future reductions in GHG emissions.

In Vacaville, 510,980 metric tons[16] of CO_2e were emitted in 2005. Vacaville's GHG emissions are similar to the State's inventory in that the energy and transportation sectors represent the largest sources of GHG emissions, as described below.

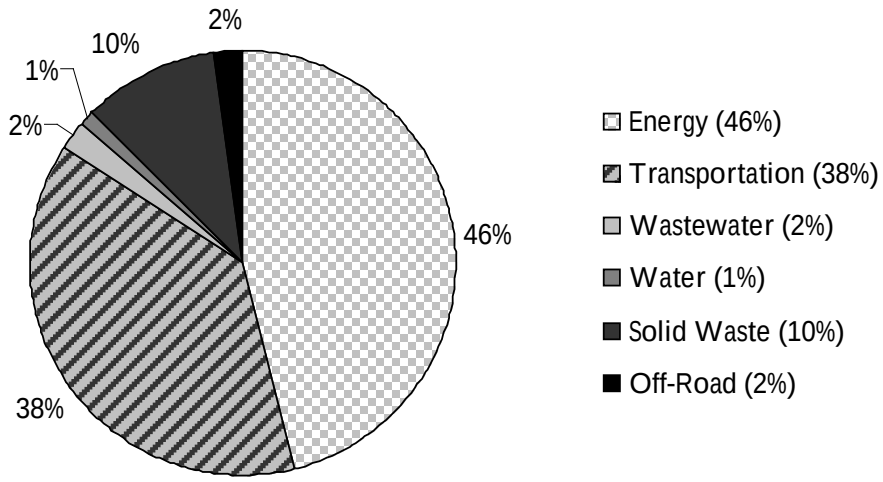
As shown in Figure 4.7-1, the energy sector represented 46 percent of the total GHG emissions in Vacaville. GHG emissions related to the energy sector result from the use of natural gas and electricity in residential, commercial, and industrial buildings within the city limit.

The second largest source of 2005 GHG emissions in Vacaville was the transportation sector, representing 38 percent of the total GHG emissions. To determine the GHG emissions from the transportation sector, STA inventoried exhaust emissions based on vehicle miles traveled (VMT) from private and City-owned vehicles on trips that begin and/or end in the city. Trips that both started and ended in Vacaville represented 30 percent of the VMT, while trips that either started or ended in another jurisdiction represented 70 percent of the VMT.

The treatment of wastewater produced approximately 2 percent of the total 2005 GHG emissions. STA calculated this number based on the GHG emissions that occurred from wastewater processing and the energy consumed to power the wastewater treatment plant.

[16] Carbon dioxide equivalent is measured by weight in metric tons.

Figure 4.7-1 2005 GHG Emissions in Vacaville



Off-road equipment, including construction equipment, industrial equipment, lawn and gardening equipment, other and light commercial equipment, contributed approximately 2 percent of the total 2005 GHG emissions in Vacaville. STA used the California Air Resource Board's OFFROAD2007 model to calculate this number.

Energy consumption associated with potable water treatment, distribution, and conveyance generated 1.1 percent of the total 2005 GHG emissions in Vacaville. STA based the energy emissions on water consumption data provided by City staff.

c. Specific Plan-Area Emissions

The Specific Plan Area is currently used for growing crops. Existing sources of GHG emissions include electricity use, water consumption, solid waste generation, and wastewater generation from the two existing single-family homes on the property, as well as emissions from agricultural equipment used

for farming. Fertilizer, which produce NOx gases that are more potent GHGs than CO_2, and agricultural crop production, which remove CO_2 from the atmosphere, are not normally counted in the GHG inventory.

C. Standards of Significance

The California Environmental Quality Act (CEQA) requires that lead agencies consider the reasonably foreseeable adverse environmental effects of projects considered for approval, including cumulative impacts. Cumulative impacts are the collective impacts of one or more past, present, or future projects that, when combined, result in adverse changes to the environment. Global climate change is considered an "effect on the environment" and an individual project's incremental contribution to global climate change, although small, can have a cumulatively significant impact when considered collectively with past present and future projects. Therefore, climate change is addressed primarily as a cumulative impact for purposes of CEQA. On December 30, 2009, the California Natural Resources Agency adopted CEQA Guidelines Amendments related to Climate Change. These amendments became effective on March 18, 2010, and state:

Consistent with the CEQA Guidelines Amendments, climate change impacts associated with the project would be considered significant if the project would:

1. Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.

As noted above, YSAQMD has stipulated that the standards of the Bay Area Air Quality Management District (BAAQMD) should be applied to the analysis of the Brighton Landing Specific Plan.[17,18,19] For this standard, BAAQMD

[17] Jones, Matt. Supervising Air Quality Planner, Yolo Solano Air Quality Management District. Personal communication with Aaron Engstrom, The Planning Center | DC&E. January 18, 2012.

sets the project-level standards of significance by which the Specific Plan is to be evaluated. According to adopted BAAQMD standards, the impact of the Specific Plan is deemed less than significant if it:

a. Complies with a Qualified Greenhouse Gas Reduction Strategy, or

b. Results in total emissions which are less than 1,100 MT CO_2e per year or which are less than 4.6 MT CO_2e per Service Population, per year, where Service Population is the total number of employees and residents within the Specific Plan area.

The City of Vacaville does not have a Qualified Greenhouse Gas Reduction Strategy. Therefore, the analysis of this standard of significance is based on standard 1.b.

2. Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

D. Project Impacts

This analysis considers buildout of the Brighton Landing Specific Plan in the year 2020, as required by BAAQMD CEQA Guidelines (May 2011) in order to compare the GHG impacts of the project to the goals adopted in State law through Executive Order S-03-05 and AB 32.

It should be noted that BAAQMD does not have thresholds for construction-period GHG emissions impacts.

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[18] Jones, Matt. Supervising Air Quality Planner, Yolo Solano Air Quality Management District. Personal communication with Aaron Engstrom, The Planning Center | DC&E. February 3, 2012.

[19] The BAAQMD thresholds of May 2011 are currently suspended due to legal action pending CEQA review. It is a matter for each jurisdiction to decide if it would like to adopt them voluntarily. The City of Vacaville has decided to use the standards believing them to be based on sound and substantial scientific evidence.

1. Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?

Development allowed under the Brighton Landing Specific Plan would generate GHG emissions directly, during construction and operation, as well as indirectly. GHGs would be emitted from construction through the use of construction vehicles and from the production of the building materials. Without detailed construction plans – which are not normally available for Specific Plans – emissions from construction cannot be calculated. There is also no adopted threshold for comparison.

GHGs would be emitted by operation of the residential, educational, and commercial uses allowed under the Specific Plan, including emissions from natural gas combustion and electricity generation to power homes and buildings, electricity for water conveyance and wastewater treatment, and from solid waste generation.

GHG emissions were calculated using the CalEEmod model. Results are shown in Table 4.7-4. For Subarea O, a land use of Neighborhood Commercial was assumed for the purpose of these calculations as it would produce results with the highest GHG emissions. There are several choices of land uses provided by the CalEEmod model within the Neighborhood Commercial category. Emissions for a strip mall are shown in Tables 4.7-4, 5, and 7.

The CalEEmod model incorporates assumptions about energy efficiency, the future statewide energy portfolio mix, and other aspects of project operation. For example, under CCR Title 24, Part 6 (also known as the California Energy Code), construction scheduled for 2014 and later will require substantially less natural gas and electricity use than new development built today. CalEEmod takes this change into account. Although the Brighton Landing Specific Plan notes that homes would be built to Build-It-Green Standards (which are stricter than the California Energy Code standards), in the absence of specific details, it is not possible to accurately calculate energy savings and GHG reductions from their use.

Table 4-7.4, summarizes the CalEEmod estimates for GHG emissions from cars, trucks, and delivery vehicles, in terms of Vehicle Miles Traveled (VMT), based on standardized land use trip rates maintained by the Institute of Transportation Engineers. Adjustments were made to CO_2e emission intensity due to expected changes in the types of vehicles on the road, engine efficiency (as mandated by the Pavley Clean Car Standards), and low carbon fuel standards that would be effective by 2020. The average modeled vehicle trip length, provided by CalEEmod, was between 7.3 and 10.8 miles, depending on land use.

As concluded in Table 4.7-4, using land uses and model defaults, the amount of GHGs that would be generated from operation of the Specific Plan in 2020 and at full Plan buildout, would be 20,143 MT CO2e. Table 4.7-5 shows the breakdown of by sector. As shown in Table 4.7-5, emissions from transportation account for approximately three quarters of the total emissions.

To calculate an average per person GHG emission, the total GHG emissions are divided by the Service Population, which is the number of estimated residents (2,107), plus the number of estimated employees (223). Service population is shown in Table 4.7-6. Calculations of GHG emissions per member of the Service Population are shown in Table 4.7-7. Using these figures, the total emissions would be 8.6 MT CO_2e per member of the Service Population, per year. This exceeds the threshold of 4.6 MT CO_2e per Service Population per year used by the BAAQMD.

Because emissions from transportation sources are such a large component of project emissions, they need to be carefully considered. If instead of using the CalEEmod default for the trip length, a value of 7.70 miles is used, which is the average overall trip rate calculated based on the traffic analysis presented in Section 4.14 of this Draft EIR, the overall result would be 18,497 MT/yr CO_2e, or 7.9 MT/yr CO_2e/Service Population. If the emissions from transportation VMT are calculated on the basis of the traffic analysis using the calculated number of vehicle trips, and the average trip length from that data

TABLE 4.7-4 **GHG EMISSIONS FROM SPECIFIC PLAN LAND USES (2020 BUILDOUT)**

Land Uses	Size	Metric	Adjusted Operational MT/yr CO2e[a]					
			Natural Gas	Electricity	Water	Waste	VMT	Area Sources[b]
Elementary School	1,000	Students	87	122	15	121		
High School	1,200	Students	166	232	32	145		
City Park	6	Acres	-	-	11	< 1		
Single-Family Housing	769	Dwelling Units	1,593	1,223	164	798		
Strip Mall	65.3	1,000 sqft	9	186	16	59		
Total			*1,854*	*1,762*	*237*	*1,123*	*15,156*	*9.6*
Grand Total								20,143

[a] Adjustments included reducing the PG&E CO_2 intensity factor to equal 33% less than the 2005 average by 2020 to account for the required Renewable Portfolio Standard, and assumption of low-flow indoor water use fixtures.

[b] "Area sources" are direct sources of air emissions located on the project site. This includes: consumer products that emit GHGs, such as cleaning compounds, personal care products, and lawn and garden products; architectural coatings; and combustion engines in landscape maintenance equipment. It excludes hearths (1,832 MT/yr CO2e), since combustion of wood is considered a biogenic source of CO_2 as most air districts do not require an evaluation of biogenic CO_2.

source is used, transportation emissions total would be 17,197 MT/yr CO_2e, or 7.4 MT/yr CO_2e/Service Population.

It should be noted that the assumption of a Neighborhood Commercial use makes a measurable difference to the calculation of probable trips. If the analysis assumed instead that Subarea O was developed with residential uses, transportation emissions would be slightly less but would not greatly affect the overall calculation. In addition, the modeling assumed a strip-commercial center for the type of Neighborhood Commercial use. If instead, a 24-hour

TABLE 4.7-5 **EMISSIONS IN CO2E MT/YR BY EMISSIONS SECTOR***

Category	Adjusted Operational MT/yr CO2e[a]
Area Sources	10
Energy	3,617
Transportation	15,156
Waste	1,123
Water	237
Total	20,142

[a] Adjustments included reducing the PG&E CO2 intensity factor to equal 33% less than the 2005 average by 2020 to account for the required Renewable Portfolio Standard, and assumption of low-flow indoor water use fixtures.

TABLE 4.7-6 **SERVICE POPULATION CALCULATION**

People	
Estimated Residents	2,107
Estimated Employees	
High School[a]	57
Elementary School[a]	47
Strip Mall[b]	119
Total Jobs	223
Total Service Population	2,330

[a] Using a 21.1 pupil/teacher ratio. Administrative staff were not taken into account.
[b] This assumes the maximum allowable development of the 4.78-acre site at 0.3 FAR, per Neighborhood Commercial zoning regulation, for a total commercial square footage of 62,460 feet, and 1 employee per 550 sq.ft. This is significantly more development than illustrated in Figure 2.2 of the Specific Plan, but is consistent with what could theoretically be allowed on the site.

TABLE 4.7-7 **GHGS FROM SPECIFIC PLAN OPERATIONS ALTERNATIVE CALCULATIONS**

	Transportation Emissions in MT CO2e/yr	Total Emissions in MT CO2e/yr	Emissions per Service Population Member
Land Use model defaults	15,156	20,142	8.6
Land Use model defaults with corrected trip length	12,211	17,197	7.4
Land Use model with corrected trip length and rates	13,511[a]	18,497	7.9

[a] This figure is slightly inflated by the trips from the Strip Mall.

convenience market had been assumed for Subarea O, the number of trips and GHG emissions would increase substantially.[20,21]

The first method of calculating the GHG emission total, which uses all the defaults from the land use model, is considered the most accurate given the approximate nature of the calculation of daily trips. All three methods produce results that are over the threshold of 4.6 MT CO2e/yr/Service Population. Emissions of GHGs would therefore be *significant*.

Impact GHG-1: Greenhouse gases emitted from project operation would be above the threshold of 4.6 MT CO2e/yr/Service Population.

[20] Both a fast food restaurant and a 24-hour convenience store were considered for this example. Total emissions in MT CO2e/yr (using land use model defaults) and including a 24-hour convenience store instead of a strip mall in Area O, would have increased from 20,142 to 23,856, and the emissions per Service Population Member from 8.6 to 10.2.

[21] Although some trips from local residents to the convenience store would be shorter that trips they currently make to the existing nearest Neighborhood Commercial center at Elmira Road and Nut Tree Road, it is likely that the additional trips from residents outside the Specific Plan area would be generated.

Mitigation Measure GHG-1a: The applicant shall implement the following BAAQMD mitigation measures:

1. The applicant shall require through contractual obligations with the contractor(s), that all heating, air conditioning, and ventilation (HVAC) ducts be sealed.

2. The applicant shall require through contractual obligation with the local utility district and contractors, that smart meters and programmable thermostats be installed in the schools and all residences.

Mitigation Measure GHG-1b: Residential developments that include garage parking shall be electrically wired to accommodate electric vehicle charging. The location of these electrical outlets shall be specified on building plans.

Mitigation Measure GHG-1c: Installation of Energy Star appliances (dishwashers, refrigerators, clothes-washers, and dryers) shall be specified in project-level residential development and in the private school plans. Installation of Energy-Star appliances shall be verified by the City during plan check.

Mitigation Measure GHG-1d: Mitigation Measure AQ-2, which includes measures to reduce air quality deterioration associated with vehicle trip generation and area source emissions from the project, shall be implemented.

Mitigation Measure GHG-1e: LED fixtures shall be used for outdoor lighting in the public right-of-way.

Mitigation Measure GHG-1f: Project features specified in Mitigation Measures GHG-1a through 1e shall be incorporated into the Specific Plan's development standards, and then subsequently included on the buildings plans.

Mitigation Measure GHG-1g: Additional mitigation as listed in the Metropolitan Transportation Commission toolbox shall be provided where feasible. This could include such features as: shuttle services to train stations, electric car-charging stations at public places such as schools or shopping centers, and improved bicycle access through the site.

Significance after Mitigation: Measures GHG-1a to -1f would assist in reducing project-related GHG emissions. However, it is likely that the total increase in GHG emissions on-site from the project would still exceed the proposed thresholds and be considered substantial. Impact GHG-1 would remain *significant and unavoidable*.

2. Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs?

In accordance with AB 32, CARB developed the Scoping Plan to outline the State's strategy to achieve 1990 level emissions by year 2020. To estimate the reductions necessary, CARB projected statewide 2020 BAU GHG emissions (i.e. GHG emissions in the absence of statewide emission reduction measures). CARB identified that the State as a whole would be required to reduce GHG emissions by 28.5 percent from year 2020 BAU to achieve the targets of AB 32.[22]

Statewide strategies to reduce GHG emissions include the Low Carbon Fuel Standard, California Appliance Energy Efficiency regulations, California Building Standards (e.g. California Green Building Code [CALGreen] and the 2008 Building and Energy Efficiency Standards), California Renewable Energy Portfolio standard (33 percent RPS), changes in the corporate average fuel economy standards (e.g. Pavley I and Pavley II), and other measures that would ensure the state is on target to achieve the GHG emissions reduction goals of AB 32. Statewide GHG emissions reduction measures that are being implemented over the next 10 years would reduce the project's GHG emis-

[22] California Air Resources Board (CARB), 2008. *Climate Change Proposed Scoping Plan, a Framework for Change.*

sions. The proposed project would be consistent with statewide GHG reduction measures.

As noted above, MTC's Sustainable Communities Strategy (SCS), which will regulate GHG emissions at the regional level, is not yet completed. In addition, the City of Vacaville is in the process of preparing a Climate Action Plan, but it is not yet adopted. There is therefore no additional applicable plan, policy, or regulation against which the Specific Plan could be compared and there would be *no impact*.

E. Cumulative Impacts

California has adopted plans and regulations to reduce GHGs statewide. However, this will not be sufficient to achieve GHG emissions reduction targets without additional actions by local governments and individual project proponents. At this time, MTC has not yet completed the SCS that will guide GHG emissions reduction efforts for the region, and the City of Vacaville has not yet adopted a Climate Action plan to guide local efforts. Therefore, it is possible that additional development already approved or allowed under the 1990 General Plan, such as the Brighton Landing Specific Plan, would result in increases rather than decreases in GHG emissions. This would be a *significant* impact. The Specific Plan alone would exceed standards of significance for greenhouse gas emissions and would contribute to a significant impact generated by other cumulative development. Therefore, the Brighton Landing Specific Plan, whether considered with approved projects, under the existing 1990 General Plan, or with the Proposed General Plan Update, would have *significant and unavoidable* cumulative impacts relating to GHG emissions.

4.8 HAZARDS AND HAZARDOUS MATERIALS

This chapter describes the existing conditions and evaluates the potential impacts associated with hazards and hazardous materials, including emergency response plans, and wildland fires. This chapter also includes a discussion of cumulative impacts under the Specific Plan.

A. Introduction

The term "hazardous material" is defined in different ways for different regulatory programs. In this EIR, the California Health and Safety Code Section 25501 definition of a hazardous material is used: "any material that, because of its 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."

Once a hazardous material is released, it moves from the source to a point of contact with the community or environment through an exposure pathway. To reach that point of contact, the exposure pathway must have:

- A contamination source or point of release.
- A transport mechanism from the source to the air, surface water, groundwater, or soil.
- A contact point where people are exposed to contaminated air, surface water, groundwater, or soil.
- A route of entry into the body. Routes of entry include ingestion (eating or drinking), inhalation (breathing), and absorption (skin contact).

If any of the above requirements for an exposure pathway are not present, the pathway is incomplete and no exposure or risk is possible. In some cases, although a pathway is complete, the likelihood that exposure will occur is very small.

B. Regulatory Framework

The following section discusses hazards and hazardous materials policies from regulatory agencies that have jurisdiction over the Specific Plan area.

1. Federal Agencies

a. Environmental Protection Agency

The federal Environmental Protection Agency (EPA) is responsible for enforcement and implementation of federal laws and regulations pertaining to hazardous materials. The legislation includes the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (commonly known as "Superfund"), the Superfund amendments and Reauthorization Acts of 1986, and the Resource Conservation and Recovery Act of 1986. The EPA provides oversight and supervision for site investigations and remediation projects, and has developed land disposal restrictions and treatment standards for the disposal of certain hazardous wastes.

b. United States Department of Transportation

Transportation of chemicals and hazardous materials is governed by the United States Department of Transportation (DOT), which stipulates the types of containers and labeling, and other restrictions to be used in the movement of such material on interstate highways.

c. Other Federal Agencies

Other federal agencies that regulate hazardous materials include the Occupational Safety and Health Administration (OSHA) and the National Institute of Health (NIH). The following federal laws and guidelines govern hazardous materials:

- Occupational Safety and Health Act
- Federal Insecticide, Fungicide and Rodenticide Act
- Comprehensive Environmental Response, Compensation and Liability Act
- Guidelines for Carcinogens and Biohazards
- Superfund Amendments and Reauthorization Act Title III

- Resource Conservation and Recovery Act
- Toxic Substances Control Act

2. State Agencies and Regulations

a. California Environmental Protection Agency

The management of hazardous materials and waste within California falls under the jurisdiction of the California Environmental Protection Agency (California EPA). The California EPA was created by the State of California to establish a cabinet-level voice for the protection of human health and the environment, and to assure the coordinated deployment of State resources.

The State of California Office of Environmental Health Hazard Assessment (OEHHA) oversees implementation of many public-health-related environmental regulatory programs within California EPA, including implementing the provisions of the Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65). Proposition 65 requires the Governor to publish, at least annually, a list of chemicals known to the State to cause cancer, birth defects, or other reproductive harm. The Proposition was intended by its authors to protect California citizens and the State's drinking-water sources from such chemicals and to inform citizens about potential exposures.

b. The California Department of Toxic Substances Control

Within the California EPA, the California Department of Toxic Substances Control (DTSC) has primary regulatory responsibility—with delegation of enforcement to local jurisdictions that enter into agreements with the State agency—for the management of hazardous materials and the generation, transport, and disposal of hazardous waste under the authority of the Hazardous Waste Control Law (HWCL). Since August 1, 1992, the Department of Toxic Substances Control (DTSC) has been authorized to implement the State's hazardous waste management program for the California EPA.

c. The California Department of Transportation

The California Department of Transportation (Caltrans) manages more than 50,000 miles of California's highway and freeway lanes, provides inter-city rail services, permits more than 400 public-use airports and special-use hospital heliports, and works with local agencies. Caltrans is also the first-responder for hazardous material spills and releases that occur on those highway and freeway lanes and along inter-city railways.

d. State Water Resources Control Board

The San Francisco Bay Regional Water Quality Control Board (RWQCB) is authorized by the State Water Resources Control Board to enforce provisions of the Porter-Cologne Water Quality Control Act of 1969. This act gives the San Francisco RWQCB authority to require groundwater investigations when the quality of groundwater or surface waters of the State is threatened and if necessary to require remediation of the site.

e. California Fire Code (2010)

California Code of Regulations, Title 24, also known as the California Building Standards Code, contains the California Fire Code (CFC), included as Title 24, Part 9. Updated every three years, the CFC includes provisions and standards for emergency planning and preparedness, fire service features, fire protection systems, hazardous materials, fire flow requirements, and fire hydrant locations and distribution. One such provision requires a 100-foot separation to open space or wildlands, which would supersede the City of Vacaville's 50-foot separation requirement, described below.[1]

3. County Regulations

a. Solano County Department of Resource Management

The Solano County Department of Resource Management is the Certified Unified Program Agency (CUPA) for Solano County, including all of its cit-

[1] State of California, 2010 California Fire Code, Title 24, Part 9; Buderi, Fred. City Planner, City of Vacaville. Personal email communication with Joanna Jansen, May 25, 2012.

ies.[2] As the CUPA, the Department of Resource Management administers the following Unified Programs:

- Hazardous Materials Release Response Plans and Inventory (Business Plan) Program
- California Accidental Release Prevention Program (CalARP)
- Underground Storage Tank Program
- Hazardous Waste Generator and Hazardous Waste On-Site Treatment Programs
- Above Ground Storage Tank Program (Spill Prevention, Control and Countermeasure Plans)[3]

b. Solano County Hazardous Materials Programs

The County has established hazardous material site mitigation practices through the Local Oversight and Spills, Leaks, Investigations and Cleanup programs to ensure that cleanup meets State standards.[4] Additionally, the County has a Waste Tire Enforcement program to monitor waste tire generation and disposal facilities.[5]

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[2] Solano County Resource Management, "Hazardous Waste," < http://www.co.solano.ca.us/depts/rm/environmental_health/hazmat/default.asp > , accessed on December 30, 2011.

[3] Solano County Resource Management, "Hazardous Materials Section," < http://www.co.solano.ca.us/civicax/filebank/blobdload.aspx?blobid=6827 > , accessed on December 30, 2011.

[4] Solano County Resource Management, "Hazardous Materials Section," < http://www.co.solano.ca.us/civicax/filebank/blobdload.aspx?blobid=6827 > , accessed on December 30, 2011.

[5] Solano County Resource Management, "Hazardous Materials Section," < http://www.co.solano.ca.us/civicax/filebank/blobdload.aspx?blobid=6827 > , accessed on December 30, 2011.

4. Local Regulations

a. Vacaville 1990 General Plan

There are several policies relevant to hazards and hazardous materials listed within the 1990 General Plan. Goals and policies relevant to the Specific Plan are listed in Table 4.8-1.

b. Vacaville Municipal Code

The City of Vacaville's Municipal Code (Code) addresses a variety of hazards and related topics, including hazardous materials and waste, emergency preparedness, airport safety, and wildfires.

Code Section 14.09.127.080 prohibits the release or emission of hazardous materials in excess of State or federally permitted levels, and requires hazardous material handling, use, transport, and storage to comply with Title 15, the Buildings and Construction portion of the Code. Chapter 14.20 establishes where storage of particular hazardous materials is prohibited. Additionally, Health and Safety (Title 8) regulates the burning and burying of hazardous waste.

Chapter 2.52 of the Code, Emergency Organization and Functions, provides for the preparation and carrying out of plans for the protection of persons and property in the event of an emergency; the direction of the emergency organization; and the coordination of the emergency functions of the City with all other public agencies, corporations, organizations, and affected private persons. The Code tasks the Vacaville Disaster Council with the preparation and adoption of the City emergency plan.

Zoning regulations in Chapter 14.09 provide supplemental standards and zoning provisions relating to airports and safety in the vicinity of airports.

Chapter 14.20.290 of the Code, Development Standards for New Construction Adjacent to Open Space Lands Where Wildfire is a Threat, provides development standards for new construction adjacent to permanent open or other open lands where no development is anticipated in the near future (as

TABLE 4.8-1 **CITY OF VACAVILLE 1990 GENERAL PLAN HAZARDS POLICIES**

Policy Number	Policy
Land Use Element	
Policy 2.1-I12	Land use changes and development proposals within the Vacaville planning area shall be consistent with the Nut Tree Airport Land Use Plan and the Travis Airport Land Use Compatibility Plan and are subject to review per the Solano County Airport Land Use Compatibility Review Procedures.
Policy 2.5-I9	Limit residential development in areas impacted by noise and potential hazards from Nut Tree Airport to uses identified in the Solano County Airport Land Use Commission Airport/Land Use Compatibility Plan and adopted zoning regulation as required.
Public Facilities, Institutions, and Utilities Element	
Policy 5.1-G4	Plan for public safety facilities for new areas. Maintain comprehensive Hazardous Materials and Emergency Response plans.
Policy 5.1-I6	Develop a Public Safety facilities plan. Include the following elements in the Plan: ¨ An Analysis of current facilities and equipment, and their adequacy to service the existing planning area. ¨ Projections of the impacts of new development in the provision of public safety services to the existing and new areas of the community. These projections should include the adequacy of facilities and equipment, response times, communications systems and the adequacy of the water system for fire fighting needs. ¨ Implement response times which have been established for police, fire and emergency medical services, and provide personnel, and facilities to meet the established standards. ¨ Establish hazardous materials use, storage and disposal standards. ¨ Development of a detailed Wildland Fire Hazard Area map for areas of local responsibility.
Policy 5.1-I7	Maintain an adequate level of disaster response preparedness through careful review of proposed developments and through staff training in and exercise of the Emergency Operations Plan.

TABLE 4.8-1 **CITY OF VACAVILLE 1990 GENERAL PLAN HAZARDS POLICIES** (CONTINUED)

Policy Number	Policy
Safety Element	
Policy 9.3-G1	Reduce the risk of wildfires by implementing policies restricting development in Extreme and High Hazard areas.
Policy 9.4-G2	Cooperate with Solano County on implementation of the Hazardous Waste Management Plan and review proposals for hazardous waste facilities for consistency with that Plan.
Policy 9.4-I2	Ensure that development proposals involving hazardous waste facilities are consistent with the Solano County Hazardous Waste Management Plan.

Source: City of Vacaville, 2007. *General Plan*.

identified in the General Plan) and where wildfire is a threat. Among the specifications are the following:

- 50 feet of non-combustible defensible space.
- A minimum 20-foot wide all-weather fire access road around the site perimeter, when required by the Fire Chief.
- A greenbelt of fire resistant, irrigated low-growth vegetation, when required by the Fire Chief, or a non-combustible fire break.
- Non-combustible fencing next to open space lands.
- A minimum 30-foot rear setback, and 10-foot side setback; and certain setbacks for accessory structures.
- Residential sprinkler system.
- Adequate ingress and egress.
- Use of non-combustible material on roofs and siding.

Under Chapter 14.20.271, the City adopts the California Fire Code with certain amendments.

C. Existing Conditions

1. Hazardous Materials

The evaluation of contamination in this chapter is based on environmental investigations performed by Wallace-Kuhl & Associates as part of a Phase I Environmental Assessment (ESA) and a Phase II Agricultural Soil Sampling.[6,7] Potential hazards on or near the site were investigated through field visits, review of agency records, and interviews in the Phase I ESA. There was no evidence that hazardous materials were being stored in large quantities on the property at the time of the field visits. Although historically farmed, the Specific Plan area has no history of housing heavy maintenance farm equipment shops. Additionally, there is no record of steam cleaning facilities, wash pad sumps, hydraulic hoists, mechanic's pits, or oil/water separators on the site.

The records review indicated:

- There are no confirmed or potential, State or federal "Superfund" sites on or within ½ mile of the Specific Plan area.
- Neither the Specific Plan area nor adjacent areas are listed as Resource Conservation and Recovery Act (RCRA) Generators.
- The Specific Plan area is not included on the US EPA's Emergency Response Notification System Database—meaning a hazardous spill or release has not occurred on the site.
- The RCRA lists no Treatment, Storage, or Disposal facilities on or within ½ mile of the site.
- There are no agency-listed leaking hazardous materials facilities or other sites of concern on or within a ½ mile of the site.
- Regulatory agency databases indicate no regional impairments to groundwater quality in the Specific Plan area.

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[6] Wallace-Kuhl & Associates, Inc., 2006. *Phase I Environmental Site Assessment: Edelweiss Property*.

[7] Wallace-Kuhl & Associates, Inc., 2007. *Phase II Agricultural Soil Sampling Results: Brighton Landing Property.*

For the past 100 years, the Specific Plan area has been agricultural land, with documented use of non-persistent pesticides. Non-persistent pesticides are considered less harmful to the environment because they breakdown more quickly than more traditional pesticides, such as organochlorines. For the Phase II soil sampling, 35 composite soil samples were taken at the site using DTSC guidelines for evaluating former agricultural areas.[8] Samples were tested for a variety of compounds—including organochlorine pesticides, lead, and arsenic, all of which can be hazardous at certain concentrations. Results with reference to various regulatory guideline levels are shown in Table 4.8-2.

Testing found detectable concentrations of two organochlorine pesticides (aldrin and toxaphene), as well as both lead and arsenic in the soil. Aldrin was detected in one of the soil samples and toxaphrene was found in 14 samples, while lead and arsenic, which naturally occur in the soil, were present in all samples. Soil concentrations were compared to the California EPA Human Health Screening Level (CHHSL), the US EPA Region IX Cancer-Based Preliminary Remedial Goal (PRG),[9] and the California Code of Regulations' Total Threshold Limit Concentration (TTLC). The TTLC is used by the State to assess whether a soil should be considered a hazardous waste. CHHSLs are concentrations of hazardous chemicals in soil or soil gas that the California EPA considers to be thresholds of concern for risks to human health. They can be used to screen sites for potential human health concerns where releases of hazardous chemicals to soils have occurred. Under most circumstances, the presence of a chemical in soil below the corresponding CHHSLs can be assumed to not pose a significant health risk to people who may live (residential CHHSLs) at the site. PRGs are used as a screening tool to evaluate whether a particular site may require additional study or remediation.

[8] Using the methodology provided in DTSC, 2002, *Interim Guidance for Sampling Agricultural Soils, Second Revision*, and DTSC, 1992, *DDT in Soil: Guidance for the Assessment of the Health Risk to Humans.*

[9] This is now known as the Regional Screening Level by DTSC. http://www.epa.gov/region9/superfund//prg/index.html, accessed January 19, 2012.

TABLE 4.8-2 **PESTICIDE CONCENTRATIONS IN THE SOIL, MILLIGRAMS PER KILOGRAM**

	Highest Level Found at Site[a]	Samples with Detections	PRG[b]	CHHSL[c]	TTLC[d]
Aldrin	0.049	1 in 35	0.029	0.033	1.4
Toxaphrene	0.12	14 in 35	0.44	0.46	5.0
Arsenic	7.6	all	0.39	0.070	500
Lead	12	all	400	150	1,000

[a] Samples analyzed were composites from several locations and individual samples may have had higher concentrations.
[b] PRG – US EPA Region IX Cancer-Based Preliminary Remedial Goal for residential development.
[c] CHHSL – California EPA Human Health Screening Level for residential development.
[d] TTLC – Total Threshold Limit Concentrations.
Sources: Wallace-Kuhl & Associates, Inc., 2007. *Phase II Agricultural Soil Sampling Results: Brighton Landing Property*.

The one sample with aldrin exceeded the PRG and CHHSL, but not the TTLC.[10] Results for toxaphrene were below the PRG, CHHL, and TTLC thresholds.

2. Wildland Fire Risk Areas

The California Department of Forestry and Fire Protection (CDF) describes "wildland/urban interface" as the condition where highly flammable native vegetation meets high-value structures, such as homes. In most cases, there is not a clearly defined boundary or interface between the structures and vegetation that present the hazard. Historically, homes in these ill-defined wildland/urban interface areas were particularly vulnerable to wildfires because they were built with a reliance on fire department response for protec-

[10] Regional Screening Levels can be found at http://www.epa.gov/region9/superfund//prg/index.html, accessed January 19, 2012.

tion rather than fire resistance, survivability, and self-protection. However, in the recent past, a number of serious statewide wildland fire conflagrations have led to recognition of the need to regulate development in these hazardous areas.

The severity of the wildfire hazard is determined by the relationship between three factors: fuel classification, topography, and critical fire weather frequency. The California Department of Forestry and Fire Protection (CALFIRE) defines Fire Hazard Zones for areas within the state. CALFIRE defines Fire Hazard as a "measure of the likelihood of an area burning and how it burns," with a zone being an area characterized by a particular level of Fire Hazard. Vacaville's Fire Hazard zones range from Moderate to High and are primarily located in the southwest corner and along the northern boundary of the city.[11] Within the Specific Plan area, CALFIRE has identified no fire hazard zones and classifies the area as "Unzoned."[12] However, the area falls within the definition of lands adjacent to open space where wildfire is a threat, and the development standards from Section 14.20.290 of the Municipal Code apply.

3. Emergency Operations Plan

As mentioned earlier, an emergency response plan is called for in both the 1990 General Plan and Municipal Code. In 2006, the City of Vacaville adopted the Association of Bay Area Governments' (ABAG), multi-jurisdictional report, *Taming Natural Disasters*, as its Hazard Mitigation Plan.[13] *Taming*

[11] California Department of Forestry and Fire Protection Fire and Resource Assessment Program, *Draft Fire Hazard Severity Zones in LRA*, http://frap.cdf.ca.gov/webdata/maps/solano/fhszl06_1_map.48.pdf, accessed on January 9, 2012.

[12] California Department of Forestry and Fire Protection Fire and Resource Assessment Program, *Draft Fire Hazard Severity Zones in LRA*, http://frap.cdf.ca.gov/webdata/maps/solano/fhszl06_1_map.48.pdf, accessed on January 9, 2012.

[13] Vacaville City Council, *Resolution 2006-94*, http://www.abag.ca.gov/bayarea/eqmaps/mitigation/Vacaville-Resolution.pdf, August 2006, accessed on January 9, 2012.

Natural Disasters offers strategies for local governments to cope with natural hazards and enhance disaster resistance.

4. Airports

The Nut Tree Airport is a public airport located approximately two miles northwest of the Specific Plan area. Another airfield, Travis Air Force Base, is a federally owned airport approximately 5.5 miles south of the Specific Plan area. The Specific Plan area does not fall within any Nut Tree Airport Land Use Compatibility zones, but does fall within Travis Air Force Base Compatibility Zone D, and regulations for allowed land uses in the Travis Air Force Base Airport Land Use Plan (ALUP) therefore apply.[14,15]

D. Standards of Significance

The proposed Specific Plan would have a significant impact in regard to hazards and hazardous materials if it would:

1. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.
2. 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.
3. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.
4. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment.

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[14] Solano County, 2010. *Nut Tree Airport Master Plan Working Paper One*, page B.21.

[15] Solano County, 2002. *Travis Air Force Base Land Use Compatibility Plan*, page 2-17.

5. 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.

6. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

7. If 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, result in a safety hazard for people residing or working in the project area.

8. If within the vicinity of a private airstrip, result in a safety hazard for people residing or working in the project area

E. Project Impacts

This section evaluates potential Specific Plan impacts associated with hazards and hazardous materials. The discussion is organized by, and responds to each of the potential impacts identified above in Section D, Standards of Significance.

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

The Specific Plan would develop the area with single-family residential homes and two community facilities (i.e. schools). Neither of these uses would be associated with significant amounts of hazardous materials.[16] However, during the construction of buildings in the Specific Plan area, there would likely be some hazardous material use. Typical hazardous materials used during construction are gasoline, diesel fuel, lubricating oil, grease, hydraulic fluid, solvents, caulking, and paint. Potential impacts during construction, including unforeseen accidents from the use of these materials on-site, would be

[16] Ongoing use of pesticides by surrounding agricultural uses is an existing condition. CEQA does not require an analysis of the effects of the environment on the project.

reduced to less-than-significant levels by compliance with all applicable regulations, as well as adherence to standard handling practices and involvement of trained personnel. Considering the limited amount of hazardous materials that would be used on-site and existing regulations governing these types of materials, this impact is considered *less than significant.*

2. 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.

As mentioned above, the proposed residential and community facility uses identified in the Specific Plan do not involve significant amounts of hazardous materials, although hazardous materials are likely to be present during construction, and earth-moving construction activities could disturb any pollutants that lie in the soil. Although the proposed high school would likely have a chemical laboratory, chemicals would be present in very small quantities.

The Union Pacific rail line is located to the east of the Specific Plan area site, and the Specific Plan's proposed detention pond area would border the railroad. The nearest proposed residential buildings would be located approximately 1,700 feet from the centerline of the railroad. Both passenger trains and freight trains use the rail line. Some hazardous materials are transported by the freight trains. Their transport is governed by the U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA) rules and regulations. Adherence to these existing rules and regulations would reduce any risks to a *less-than-significant* level.

The Easterly Waste Water Treatment Plant (EWWTP) is located one mile east of the Specific Plan area. Hazardous materials sodium hypochlorite, ferric/ferrous chloride, and sodium bisulfite are used at the facility and their quantities are recorded in the Hazardous Materials Business Plan kept with Solano County Environmental Health Department. The City of Vacaville employes a full-time Public Works Department safety officer to institute safety procedure to protect the public from any hazardous materials releases from

the EWWTP. The City's Emergency Operations Plan (EOP) provides guidelines for notification of appropriate personnel in the event of a hazardous release.[17] With these procedures in place, the risks of hazardous materials used by the EWWTP release affecting either the detention basin or the Specific Plan area are *less than significant*.

A Phase I (ESA) with follow-up Phase II soil sampling was carried out for the Specific Plan area to test for the presence of agricultural chemicals and their residues, including lead and arsenic. Results are shown in Table 4.8-2. As mentioned previously, lead and arsenic were found at levels similar to background level. In the 35 composite soil samples, only one organochlorine pesticide, aldrin, was found at levels above regulatory guidelines (PRG and CHHSL). The Phase II recommended that the area from which the aldrin-contaminated samples came (which were mixed together to make one composite sample) should be sampled further to see the lateral extent of the aldrin-contaminated soils and to determine the highest concentrations present. This information is needed to assess if special precautions are necessary during construction, whether additional soil removal is required to ensure that levels do not exceed levels for residential development and schools, and whether or not any of the excavated soil should be treated as a hazardous waste.

Impact HAZ-1: Pesticide-contaminated soils could be present in the Specific Plan area above levels considered harmful to human health for residential development and schools.

> Mitigation Measure: HAZ-1: Additional samples shall be taken from the area of the soil samples SS19 analyzed in the Phase II soil sampling, and tested for organochlorine pesticides. If analyses indicate aldrin or other pesticides are present over regulatory limits, the area shall be excavated until all contaminated soil is removed and the contaminated soil removed to the nearest appropriate landfill, or a risk assessment shall be carried

[17] AES, 2010. *Easterly Wastewater Treatment Project Final EIR*.

out to show that the levels that remain would not be harmful to human health.

Significance After Mitigation: With additional soil sampling and analysis from the affected area, the impact would be *less than significant.*

3. Emit hazardous emissions or handle hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.

There are no existing schools within ¼-mile of the Specific Plan area. However, within the Specific Plan area, two schools, a private high school, and a public elementary school are proposed. Any new construction that may occur in the Specific Plan area would be required to adhere to the previously described regulations enforced by federal, State, and local agencies related to hazardous materials and emissions, in particular the School Siting Criteria (Section 17210 of the Education Code). In addition, as discussed above, land uses proposed in the Specific Plan and 1990 General Plan do not include any uses, such as Industrial uses, that require ongoing handling of hazardous materials. Clean up of soil with remnant pesticides and disposal of any contaminated soil is described above under Threshold 2.

Specific Plan implementation would not generate hazardous emissions or result in the type of handling or material storage that could potentially result in harmful and accidental upsets. Therefore, potential impacts on the aforementioned schools from emissions or hazardous materials accidents would be *less than significant*.

4. Be located on a site which is included on a list of hazardous material sites and create a significant hazard to the public or the environment.

No part of the Specific Plan area is included on a list of hazardous materials sites. Therefore, there would be *no impact* from future development on a hazardous materials site.

5. Expose people or structures to a significant risk of loss, injury, or death involving wildland fires.

CALFIRE identifies no fire hazard zones within the Specific Plan area, which like adjacent land, is considered "Unzoned."[18] This is because most of the land is crop land with few trees or areas of natural undergrowth that could catch fire, and it is adjacent to a developed residential area. However, the Vacaville Fire Department identifies the area as one exposed to open space wildfire threat. The VFD receives numerous calls for service on grass fires along the east side of Leisure Town Road each year. Since the project would result in the construction of residential development with open lands to the north, south, and east of the project, it would be subject to the development standards of Section 14.20.290 of the Vacaville Municipal Code. The Specific Plan shows that, at build-out of the project, the perimeter of the development will include landscaped trail corridors that may provide adequate protection from open land fire. However, because the project will be constructed in phases, there is the potential for phases of the project to place residential yards directly adjacent to lands that are open and a potential source of grass fires. Thus, there would be a *significant* impact.

Impact HAZ-2: Construction of the Specific Plan would place residences in a zone subject to wildfires.

> Mitigation Measure HAZ-2: Development under the Specific Plan shall at all times conform to the development standards laid down in Section 14.20.290 of the Vacaville Municipal Code, Development Standards for New Construction Adjacent to Open Space Lands Where Wildfire Is a Threat. Fire breaks at the boundary with undeveloped lands must be provided at all stages during Plan buildout, subject to the approval of the Vacaville Fire Department.

[18] California Department of Forestry and Fire Protection Fire and Resource Assessment Program, *Draft Fire Hazard Severity Zones in the LRA*, http://frap.cdf.ca.gov/webdata/maps/solano/fhszl06_1_map.48.pdf, accessed on January 9, 2012.

Significance After Mitigation: With adherence to Section 14.20.290 of the Municipal Code even during plan buildout, the risk of wildfires to the Specific Plan development would be *less than significant.*

Also see Chapter 4.13, Public Services and Recreation, for a detailed discussion of impacts related to the provision of fire protection services.

6. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

The California Fire Code that has been adopted by the City of Vacaville, requires adequate emergency access to a development for both emergency response and for evacuation purposes (such as in the event of a spill on the rail line, or a fast moving grass fire). Adequate access must be provided during all phases of construction. The first several phases of the Specific Plan would be at the east end of the site, and those phases would therefore be exposed to hazards from accidents on the nearby railway or grassfires on adjacent undeveloped land, but would have only one access point for both emergency response and evacuation, at Elmira Road. The Fire Department requires at least two points of access, beginning with the first phase of construction to ensure this access. This has been recognized in Chapter 4.14, Traffic and Transportation, that includes Mitigation Measures TRAF-2a and TRAF-2B. Road plans for each stage of the Specific Plan buildout would be reviewed by the Fire Department to assure that adequate emergency access is provided.

Implementation by the City of policies and programs in the 1990 General Plan would also prevent new development in the Plan Area from interfering with emergency response or evacuation plans. Specifically, 1990 General Plan Policy 5.1-I7 requires maintaining an adequate level of preparedness, including training in and the exercise of the City's Emergency Operations Plan. Additionally, the Municipal Code Section 2.52 establishes emergency organization and functions, and codifies the Emergency Operations Plan. The adopted Emergency Operations Plan, developed by ABAG, contains policies and measures to help coordinate between jurisdictions and agencies in the event of

an emergency. It describes procedures to mitigate the effects of emergencies and natural hazards, and details emergency evacuation planning actions.[19]

Despite ongoing compliance with these existing Emergency Response and evacuation measures, there would still be a *significant* impact from the implementation of the Specific Plan given its current road configuration and phasing plans.

Impact HAZ-3: The first phases of the project to be constructed would only have one route for emergency access, along Elmira Road, which the Vacaville Fire Department considers to be inadequate emergency access. Traffic circles and other traffic calming devices, as well as other site-specific design might delay emergency response time or impede movement of emergency vehicles. Therefore, there would be a *significant* impact.

Mitigation Measure TRAF-3a: See Mitigation Measure TRAF-2a.

Mitigation Measure TRAF-3b: See Mitigation Measure TRAF-2b.

Significant After Mitigation: If the street system is designed to accommodate emergency vehicle passage, the impact is *less than significant.*

7. Safety hazard for people residing or working in the project area within an airport land use plan or within 2 miles of a public or public use airport.

The Nut Tree Airport is located approximately two miles south of the Specific Plan area. As discussed in Chapter 4.10 Land Use and Planning, the Specific Plan area is not within any Nut Tree Airport Land Use Compatibility zones, meaning it is outside of the safety hazard area associated with the airport.

The Travis Air Force Base, although more than five miles south of the Specific Plan area, has an Airport Land Use Plan (ALUP) which identifies the Spe-

[19] ABAG, 2010. *Taming Natural Disasters*, pages vii, 1 to 6, and 5-8.

cific Plan area as lying within Compatibility Zone D.[20] This zone requires Airport Land Use Commission and Federal Aviation Administration review of anything with a proposed height over 200 feet.[21] None of the proposed uses are limited by these height restrictions. As the Specific Plan area would contain only residential uses and two schools, structures of this height are highly unlikely and, therefore, would be a *less-than-significant* impact.

8. Safety hazard for people residing or working in the project area within the vicinity of a private airstrip.

There are no private airstrips within or near the Specific Plan area and there would be *no impact.*

F. Cumulative Impacts

This section analyzes potential impacts related to hazards and hazardous materials that could occur from a combination of the Specific Plan with other approved projects in the surrounding area. Development under the Specific Plan would not result in the transport, use, or disposal of significant amounts of hazardous materials. Any transport or use of hazardous materials, such as that occurring during construction, would be closely monitored and regulated. All approved projects, development under the 1990 General Plan, or development with the Proposed General Plan Update would have to comply with hazards and hazardous materials regulations and policies. Specifically, local, State, and federal policies and programs mentioned in this Chapter would ensure that any storage or transport of hazardous materials is conducted in a safe manner so as to protect public health and the environment. Also, any new development that would occur within the Specific Plan area or within close proximity to Vacaville schools and which would result in the

[20] Solano County, 2002. *Travis Air Force Base Land Use Compatibility Plan*, page 2-17.

[21] Solano County, 2002. *Travis Air Force Base Land Use Compatibility Plan*, page 2-13.

transport and/or use of hazardous materials would be required to follow the local, State, and federal regulations stated in previous discussions.

Thus, there would be no significant cumulative impact from hazards or hazardous materials associated with likely development in the Specific Plan area, nor would the Specific Plan contribute to a significant cumulative impact. Additionally, compliance with existing emergency response measures (as identified in the Project Impact section) would preclude any impacts or cumulative impacts in this regard. There would therefore be *less-than-significant cumulative impacts.*

4.9 HYDROLOGY AND WATER QUALITY

This chapter outlines the regulatory framework, describes the existing hydrological conditions of the proposed Specific Plan area, and evaluates the potential impacts associated with the project. This chapter also includes a discussion of cumulative impacts to hydrology and water quality.

A. Regulatory Framework

The following section discusses hydrology and water quality-related policies and regulations from agencies that have jurisdiction over the Specific Plan area.

1. Federal Regulations

a. Federal Emergency Management Agency

The Federal Emergency Management Agency (FEMA) issues Flood Insurance Rate Maps (FIRMs) that identify which land areas are subject to flooding. These maps provide flood information and identify flood hazard zones in the community. The design standard for flood protection is established by FEMA. FEMA's minimum level of flood protection for new development is the 100-year flood event, also described as a flood that has a 1-in-100 chance of occurring in any given year.

b. U.S. Environmental Protection Agency (EPA), U.S. Army Corps of Engineers and Clean Water Act (CWA)

The U.S. Environmental Protection Agency (EPA) is the lead federal agency responsible for water quality management. The Clean Water Act (CWA) of 1972 is the primary federal law that governs and authorizes water quality control activities by the EPA as well as the states. Various elements of the CWA address water quality, and they are discussed below.

Under federal law, the EPA has published water quality regulations under Volume 40 of the Code of Federal Regulations (40 CFR). Section 303 of the CWA requires states to adopt water quality standards for all surface waters of the United States. As defined by the CWA, water quality standards consist of two elements: (1) designated beneficial uses of the water body in question and

(2) criteria that protect the designated uses. Section 304(a) requires the EPA to publish advisory water quality criteria that accurately reflect the latest scientific knowledge on the kind and extent of all effects on health and welfare that may be expected from the presence of pollutants in water. Where multiple uses exist, water quality standards must protect the most sensitive use. In California, the EPA has designated the State Water Resources Control Board (SWRCB) and its Regional Water Quality Control Boards (RWQCBs) with authority to identify beneficial uses and adopt applicable water quality objectives.

c. National Pollutant Discharge Elimination System

The National Pollutant Discharge Elimination System (NPDES) permit program was established by the CWA to regulate municipal and industrial discharges to surface waters of the United States from their municipal separate storm sewer systems (MS4s). NPDES permit regulations have been established for broad categories of discharges, including point-source municipal waste discharges and nonpoint-source stormwater runoff. The SWRCB is responsible for issuing NPDES permits to cities and counties through the RWQCB. Large communities, which have the potential to cause large impacts to receiving waters, are issued a permit with requirements specific to the community. For smaller communities, the California SWRCB elected to adopt a statewide general permit (Water Quality Order No. 2003-0005-DWQ) for Small Municipal Separate Storm Sewer System (MS4) operators to efficiently regulate stormwater discharges from small MS4s under a single permit. Permittees must develop and implement a Stormwater Management Plan (SWMP) with the goal of reducing the discharge of pollutants to the maximum extent practicable. The City of Vacaville is considered a permittee under the statewide general permit.

2. State Regulations

a. Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Porter-Cologne Act) of 1969 is California's statutory authority for the protection of water quality. Under the Act, the State must adopt water quality policies, plans, and objec-

tives that protect the State's waters for the use and enjoyment of the people. The Act sets forth the obligations of the SWRCB and RWQCBs to adopt and periodically update water quality control plans (Basin Plans). Basin Plans are the regional water quality control plans required by both the CWA and Porter-Cologne Act in which beneficial uses, water quality objectives, and implementation programs are established for each of the nine regions in California. The Act also requires waste dischargers to notify the RWQCBs of their activities through the filing of Reports of Waste Discharge (RWD) and authorizes the SWRCB and RWQCBs to issue and enforce waste discharge requirements (WDRs), NPDES permits, Section 401 water quality certifications, or other approvals.[1]

b. State Regulatory Agencies

In California, the SWRCB has broad authority over water quality control issues for the State. The SWRCB is responsible for developing statewide water quality policy and exercises the powers delegated to the State by the federal government under the CWA. Other State agencies with jurisdiction over water quality regulation in California include the California Department of Health Services (DHS) for drinking water regulations, the California Department of Pesticide Regulation, the California Department of Fish and Game (CDFG), and the Office of Environmental Health and Hazard Assessment.

Regional authority for planning, permitting, and enforcement is delegated to the nine RWQCBs. The regional boards are required to formulate and adopt water quality control plans for all areas in the region and establish water quality objectives in the plans. Vacaville is in the jurisdiction of the Central Valley RWQCB.

The Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins is the Board's master water quality control planning

[1] Porter-Cologne Water Quality Act's website. http://ceres.ca.gov/wetlands/permitting/porter.html, accessed September 8, 2009.

document. It designates beneficial uses and water quality objectives for waters of the State, including surface waters and groundwater. It also includes programs of implementation to achieve water quality objectives. The Basin Plan established water quality objectives for total dissolved solids (TDS), mineral constituents, and turbidity on a watershed-by-watershed basis within the Region, while objectives for total and fecal coliform bacteria, nutrients (total nitrogen and total phosphorus), pH, dissolved oxygen, and un-ionized ammonia are set on a region-wide basis.

Additionally, water quality objectives for toxic organic and toxic inorganic constituents are established by the corresponding State and federal drinking water standards for waters designated as municipal supply. The RWQCB also implements the Federal California Toxics Rule Water Quality Standards for Toxic Pollutants (CTR) established by the U.S. EPA in Title 40, Section 141.38 of the Code of Federal Regulations. The California Toxics Rule establishes numeric criteria for cyanide, metals, and toxic organic constituents.

c. Regional Water Quality Control Board (Central Valley Region)

i. NPDES Construction General Permit

Construction activities that disturb one acre or more of land, and construction on smaller sites that are part of a larger project, must comply with a Construction General Permit that regulates stormwater leaving construction sites. Site owners must notify the state, prepare and implement a Stormwater Pollution Prevention Plan (SWPPP), and monitor the effectiveness of the plan. The plan does not have to be submitted to the Regional Board but must be on site and available to inspectors.[2] A SWPPP must include "Best Management Practices" (BMPs) designed to reduce potential impacts to surface water quality through the construction and life of the project.

[2] There are also post-construction requirements of the Construction General Permit that apply only to projects located in communities that are not covered under an NPDES MS4 permit. As Vacaville has an MS4 permit, these do not apply.

On September 2, 2009, the SWRCB adopted a new NPDES general permit pertaining to construction (Order No. 2009-0009 DWQ).[3] The "General Construction Permit," formally titled the "General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities," expands the regulatory requirements pertaining to the treatment and control of stormwater effluent resulting from demolition, construction, and development activities.

ii. NPDES Post-Construction Stormwater Quality

Discharges of urban runoff in the City of Vacaville are regulated under the NPDES Phase II General Permit (Water Quality Order No. 2003-0005-DWQ). This permit requires that permittees implement BMPs that reduce pollutants in storm runoff to the Maximum Extent Practicable to protect water quality. See below under local regulations.

d. California Fish and Game Code

The CDFG protects streams, water bodies, and riparian corridors through the streambed alteration agreement process under Section 1601 to 1606 of the California Fish and Game Code. The Fish and Game Code stipulates that it is "unlawful to substantially divert or obstruct the natural flow or substantially change the bed, channel or bank of any river, stream or lake" without notifying the Department, incorporating necessary mitigation and obtaining a streambed alteration agreement. CDFG's jurisdiction extends to the top of banks and often includes the outer edge of riparian vegetation canopy cover.

e. Assembly Bill 162 (Local Planning)

Assembly Bill 162 (AB 162) was approved by the Governor in 2007, amended Sections 65302, 65303.4, 65352, 65584.04, and 65584.06, and added Sections 65300.2 and 65302.7, to the Government Code. The new and amended sections require cities and counties to address flood management in the Land Use, Conservation, Safety, and Housing Elements of their General Plans.

[3] This order was amended by 2010-0014-DWQ.

This ensures that flood management is addressed in General Plans in the following ways:

- Requires that areas subject to flooding, as identified by federal and State maps of floodplains, are identified in the Land Use Element for annual review.
- Requires that rivers, creeks, streams, flood corridors, riparian habitat and land that may accommodate floodwater for specified purposes are identified in the Conservation Element, upon the next Housing Element review on or after January 1, 2009.
- Requires that flood hazard zones are identified and policies to avoid or minimize the unreasonable risks of flooding are established in the Safety Element, by the next Housing Element review on or after January 2009.
- Permits areas where the flood management infrastructure is inadequate and housing development impractical to be excluded from the determination of land suitable for urban development in the Housing Element analysis.

f. Senate Bill (SB) 5

The requirements of this bill are listed below.

- The State must develop 100-year and 200-year flood maps for the Central Valley by July 1, 2008. Preliminary maps for Solano County, based on available floodplain delineations, are published on the web site for the California Department of Water Resources.[4] The preliminary maps show flooding in several areas in Vacaville including:
  - Along Horse Creek at Interstate 80
  - North of Interstate 80 between Midway Road and Vaca Valley Road
  - East of Leisure Town Road along Maple Road
  - Alamo Creek at Marshall Drive
  - Alamo Creek from Alamo Drive to about 1 mile past Lewis Road

[4] California Department of Water Resources, *Best Available Map*, http://gis.bam.water.ca.gov/bam/.

- The Central Valley Flood Protection Board (CVFPB) (formerly the Reclamation Board) must establish a Central Valley Flood Protection Plan (CVFPP) by 2012. The CVFPP will establish a system-wide approach to improving flood management, including recommendations for structural and non-structural means for improving performance and eliminating the deficiencies of flood management facilities.
- Within two years after the adoption of the CVFPP, communities within the Sacramento-San Joaquin Valley, including Vacaville, must amend their General Plans to include data and analysis, goals, and policies for the protection of lives and property from flooding, and related feasible implementation measures that are consistent with the CVFPP. Within one year of General Plan adoption, zoning ordinance amendments must be enacted to maintain consistency with the General Plan.
- Counties must collaborate with cities within their jurisdiction to develop flood emergency plans.

Note that the implications for the City of Vacaville from the two AB 5 requirements listed below are currently uncertain. The State has not clarified whether these requirements apply to communities like Vacaville that are not protected by the State Project Levees and are not within the Sacramento-San Joaquin Watershed.

- Cities and counties must revise the Safety Element of their General Plan in order to show 200-year flood maps and maps of levee protection zones.
- By 2015, for areas with a population of 10,000 people or greater, local governments cannot approve new developments unless the land under review has 200-year flood protection, the city has conditioned the project to provide an adequate level of protection, or efforts are in place to provide that level of protection.

g. Assembly Bill 70 (Flood Liability)

Assembly Bill 70 was approved by the Governor in 2007 and added Section 8307 to the Water Code. The Section was developed to distribute responsibility for flood control damage among State and local entities and it

requires local governments to contribute their fair share to a flood's cost when they make unreasonable development decisions.

3. Local Policies

a. Existing General Plan

The General Plan policies related to hydrology and water quality are listed in Table 4.9-1.

b. Floodplain Management Ordinance

The City has adopted a Floodplain Management Ordinance (Section 14.18 of the Municipal Code) that describes methods for reducing flood losses. The Floodplain Management Ordinance contains a number of provisions for flood hazard reduction, including:

- Residential construction, either new or a substantial improvement, must have the lowest floor, including the basement, elevated to, or above, the base flood elevation, the computed elevation to which floodwater is anticipated to rise during a 100-year storm event. A 100–year storm is defined as storm that has a 1 percent chance of occurring in any given year. Upon the completion of the structure, the elevation of the lowest floor must be certified by a registered professional engineer or surveyor, and verified by the community building inspector to be properly elevated.
- Nonresidential construction, either new or a substantial improvement, must either be elevated to conform to the requirements described above for residential construction, or be flood-proofed below the base flood elevation. If the structure is flood-proofed, it must be watertight with the wall substantially impermeable to the passage of water, have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy, and be certified by a registered engineer or architect.
- All preliminary subdivision proposals must identify the special flood hazard area and the elevation of the base flood.

TABLE 4.9-1 **CITY OF VACAVILLE 1990 GENERAL PLAN POLICIES RELEVANT TO HYDROLOGY**

Policy Number	Policy
Policy 3.5-G 1	Maintain open areas needed to retain stormwater and prevent flooding of urban or agricultural land.
Policy 3.5-I 5	Where possible, minimize cut-and-fill activities and disturbance of natural habitats and vegetation. At the minimum, revegetation of cut-and-fill on slopes should be required.
Policy 5.1-I 13	Evaluate the feasibility of using wastewater for irrigation. Whenever possible, use non-treated water for irrigation in large landscaped areas.
Policy 8.1-G 4	Preserve and protect water resource areas, including the Alamo, Encinosa, Gibson and Ulatis Creek watersheds.
Policy 8.1-I 5	Protect existing stream channels by requiring buffering or landscaped setbacks and storm runoff interception.
Policy 8.4-G 1	Encourage and support water conservation programs.
Policy 8.4-G 2	Protect and conserve the City's well field.
Policy 8.4-I 2	Require development proposals to incorporate water-conserving landscape designs.
Policy 8.4-I 3	Continue to implement a water conservation landscape standard, which addresses the use of drought-tolerant plant materials, for public buildings, parks, and recreation facilities.
Policy 8.4-I 5	Do not allow development that would adversely affect the City's well field.
Policy 8.4-I 6	Whenever possible, use non-treated water for irrigation in large landscaped areas.
Policy 9.2-G 1	Locate development outside mapped flood-prone areas unless mitigation of flood risk is assured.
Policy 9.2-G 2	Continue to develop a comprehensive system of drainage improvements to minimize flood hazard.
Policy 9.2-G 3	The additional runoff caused by development shall be mitigated.
Policy 9.2-I 1	Develop a financing plan and construct upstream detention flood basins.

TABLE 4.9-1 **CITY OF VACAVILLE 1990 GENERAL PLAN POLICIES RELEVANT TO HYDROLOGY** (CONTINUED)

Policy Number	Policy
Policy 9.2-I 2	Evaluate storm-drainage needs for each project in the context of demand and capacity when the drainage area is fully developed. Continue to require Development Impact Fees for new development to construct planned regional drainage detention basins to accommodate increased flow. In the Alamo Creek Watershed upstream of Peabody Road, which includes Alamo, Laguna and Encinosa creeks, require post-development 10-year and 100-year peak flows to be reduced to 90 percent of predevelopment levels. For the remainder of the study area, for development involving new connections to the creeks, peak flows shall not exceed predevelopment levels for a 10- and 100-year peak flow. *This is required to reduce downstream flood hazard.*
Policy 9.2-I 3	Continue to cooperate with the Solano County Water Agency on developing a comprehensive stormwater management program to accommodate additional development outside the existing urban area.
Policy 9.2-I 4	Assure through a Master Drainage Plan and development ordinances that proposed new development adequately provides for development of on-site and downstream off-site mitigation of potential flood hazards and drainage problems and require development fees to fund the required improvements.
Policy 9.2-I 5	Encourage the formation of flood control assessment districts or consider fees for those areas in which flooding and drainage problems exist, to mitigate flooding through physical improvements.

Source: City of Vacaville, *Vacaville General Plan*, 1990.

- All subdivision plans must provide the elevation of the proposed structure(s) and pad(s). If the site is filled above the base flood elevation, the lowest floor and pad elevations must be certified by a registered professional engineer or surveyor.
- All subdivision proposals must be consistent with the need to minimize flood damage.
- All subdivision proposals must have public utilities and facilities located and constructed to minimize flood damage.

- All subdivisions must provide adequate drainage to reduce exposure to flood hazards.
- Encroachments within designated floodways are prohibited, including fill, new construction, substantial improvement, and other new development, unless certification by a registered professional engineer is provided demonstrating that encroachments do not result in any increase in the base flood elevation during the occurrence of the base flood discharge.

c. Storm Drainage Master Plan

The City completed a draft Storm Drainage Master Plan (SDMP) in 1996, and updated it in 2001. The SDMP evaluates the existing storm drain systems to identify existing deficiencies and required improvements. The focus of the SDMP is to identify improvements necessary to provide 100-year level flood protection to areas in Vacaville proposed for new development while maintaining, as a minimum, the existing level of protection in developed areas within the city that periodically flood. To this end, the SDMP outlined a staged capital improvements program to resolve existing storm drain deficiencies, and developed appropriate development impact fees for storm drainage facilities to ensure future development does not impact storm drainage for existing development within the city. The SDMP also provided a detailed inventory of existing storm drainage facilities.

d. Vacaville Stormwater Management Plan

The City has developed a Stormwater Management Plan that describes activities being performed and activities to be performed by the City to meet the requirements of the NPDES permit. Also, Section DS 4-13 of the City's Storm Drain Design Standards provides requirements for water quality control. This section requires that storm drain system improvements be designed to prevent any net detrimental change in runoff quality resulting from new development and requires that BMPs be implemented with development projects.

e. Vacaville Standard Specifications and Standard Drawings

City of Vacaville *Standard Specifications and Standard Drawings* require that detention basins be designed to the following criteria:[5]

- New development shall mitigate the increase of the 10- and 100-year peak runoff from a project site over the predevelopment conditions (due to higher peak flows from the site, filling or building in overflow area, or altered flow paths).
- In the Alamo Creek Watershed upstream of Peabody Road, which includes Alamo Creek, Encinosa Creek, and Laguna Creek, the 10- and 100-year post-development peak flows shall be reduced to 90 percent of pre-development levels. Additionally, the five-year storm shall be evaluated in the Alamo Creek Watershed upstream of Peabody Road to ensure that drainage facilities do not increase the peak 5-year flows downstream in the open channels or to receiving waters.
- Detention facilities must be designed for the 100-year, 24-hour storm event.

f. Municipal Code

The Vacaville Municipal Code has several sections relating to hydrology and water quality, including 13.12 Water, 13.14 Control of Backflow and Cross-Connections, 13.20 Water Conservation, and 14.26 Urban Stormwater Quality Management and Discharge Control. These regulations provide guidelines for water service provision, describe standards for connection sizes, protect and maintain the potable water system, conserve water use, reduce water consumption, and protect water quality.

[5] City of Vacaville, 2006. *City of Vacaville Standard Specifications and Standard Drawings.*

B. Existing Conditions

1. Surface Water Resources

The Specific Plan area is located in the Old Alamo Creek watershed. Old Alamo Creek is a modified water body that was formerly the downstream portion of Alamo Creek. Alamo Creek originates on the eastern slopes of Mount Vaca and then flows through the city before joining Ulatis Creek roughly six miles downstream (east) of the Specific Plan area. Ulatis Creek continues flowing to the east and southeast and ultimately drains to the Sacramento River via Cache Slough. Near the Specific Plan area, Old Alamo Creek is located north of Elmira Road, just north of the Specific Plan area, as shown on Figure 4.9-1.

During the 1960s, several features of the lower Ulatis Creek watershed were modified to protect local agricultural lands from damaging floods, which had historically occurred along several of the major creeks in the area, including Alamo Creek. One of the modifications involved the redirection of flows from Alamo Creek into a new channel along a more southerly alignment. The new channel became known as New Alamo Creek, and the existing channel downstream of the redirection point became known as Old Alamo Creek.

As a result of the modifications to Alamo Creek, the drainage area to the current Old Alamo Creek was reduced to a localized section of eastern Vacaville plus additional unincorporated areas to the east. The portion of the Old Alamo Creek watershed upstream of the unincorporated town of Elmira is indicated in Figure 4.9-1. The tributary area draining to the creek from this area is approximately 990 acres.

In the Specific Plan area, runoff occurs as sheet flow traveling from west to east until joining one of the small agricultural ditches on-site. The ditches convey runoff to the eastern boundary of the Specific Plan area and on to the existing Solano Irrigation District Frost Canal located west of the Union Pacific Railroad (UPRR). The Frost Canal conveys runoff north to Old Alamo Creek near Elmira Road. During significant storm

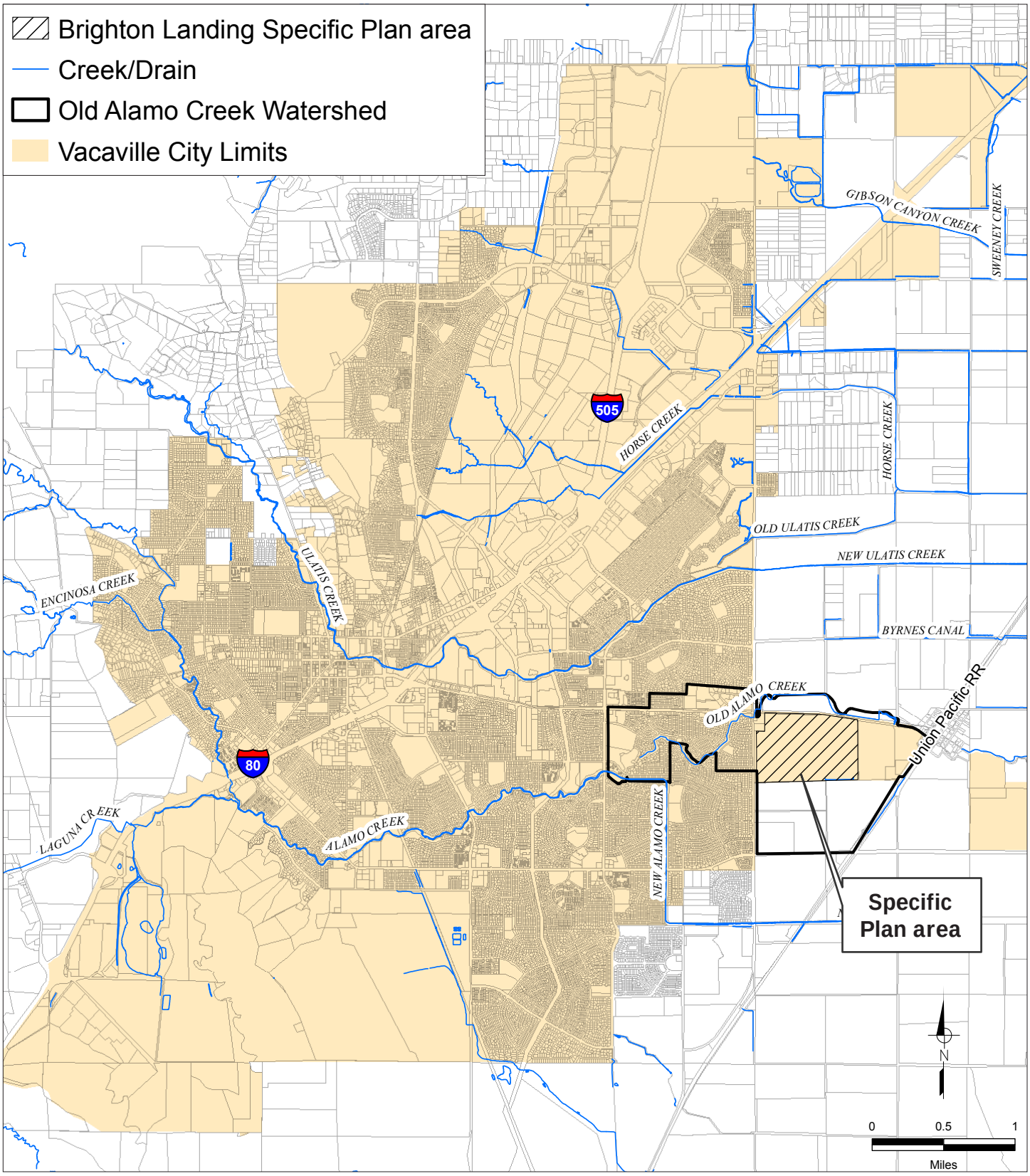


FIGURE 4.9-1

SURFACE WATER RESOURCES

events, the Frost Canal is known to overtop its banks. During such events, flows from the canal will flood the adjacent areas and spill to the east, over a dirt road, and into a ditch located immediately adjacent to the UPRR. This ditch conveys runoff north to a point just south of Elmira Road where a culvert carries runoff to the east side of the railroad. Runoff is then transported north for a short distance in a ditch before joining Old Alamo Creek.

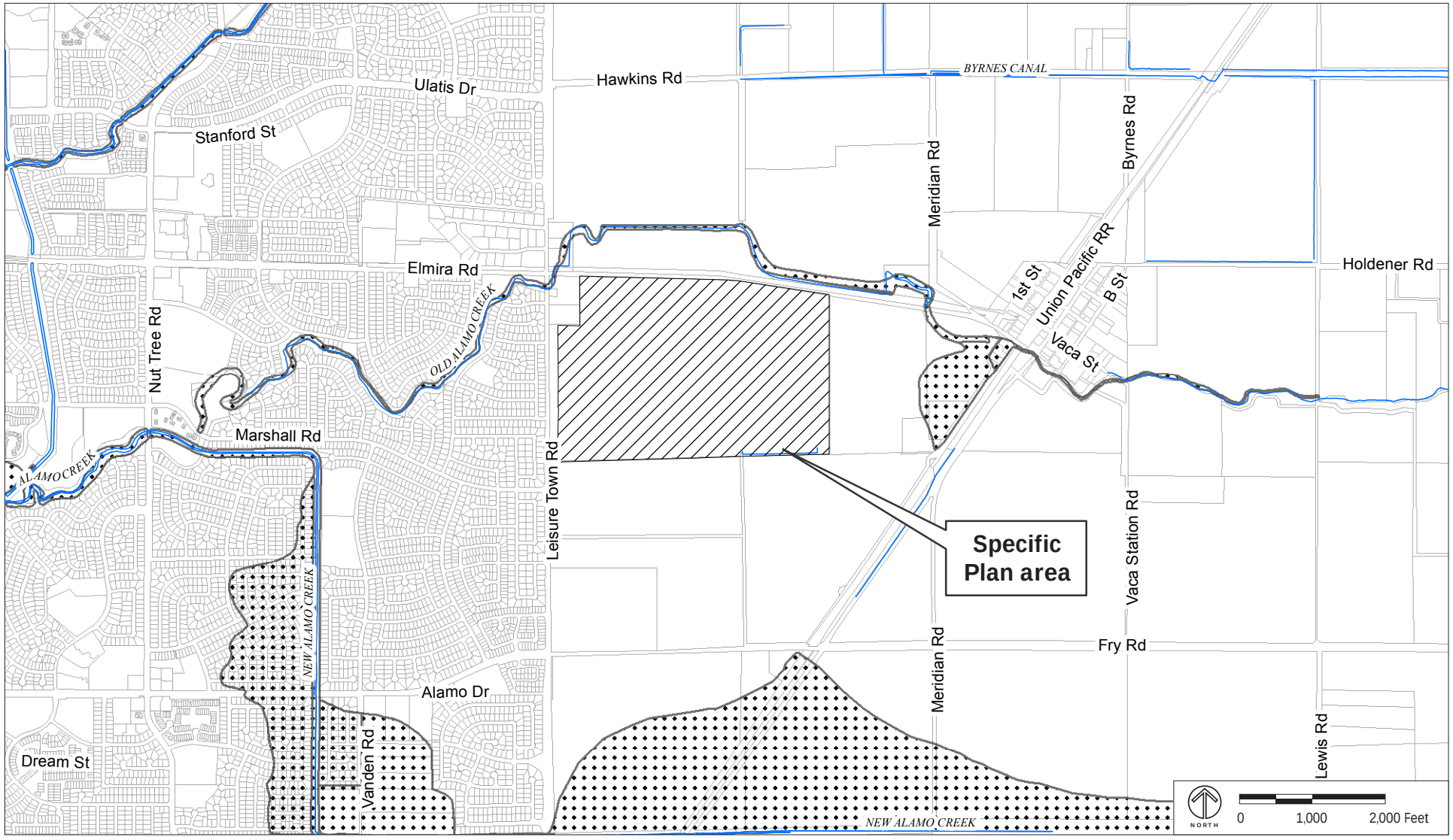
2. Topography and Soils

The topography in the Specific Plan area is flat with slopes ranging from 0.2 to 0.3 percent. The ground slopes uniformly from west to east. According to soil data from the Natural Resources Conservation Service, the predominant soils at the site include Brentwood clay loam, Rincon clay loam, and Capay silty clay loam. These soils are generally considered to have moderate potential for erosion. The soils fall within Hydrologic Soils Groups B, C, and D, which have infiltration capacities ranging from moderate (Group B) to very low (Group D).

3. 100-Year and 200-Year Floodplains

According to the Flood Insurance Rate Map 06095C0281E, which was published by FEMA in May 2009, the Specific Plan area is not subject to flooding during a 100-year storm. Flooding has been identified downstream (east) of the Specific Plan area along the Frost Canal and UPRR, as shown on Figure 4.9-2. Runoff from the Specific Plan area flows to this floodplain area and contributes to the flooding.

In response to Senate Bill 5, the California Department of Water Resources has prepared preliminary (i.e. Best Available) maps depicting the estimated 200-year floodplain for the Sacramento-San Joaquin Valley. These best available maps were reviewed and the Specific Plan area was determined to be outside of a known 200-year floodplain.



Brighton Landing Specific Plan area

Creek/Drain

100-Year FEMA Flood Plain

FIGURE 4.9-2

100-YEAR FEMA FLOOD PLAIN

4. Surface Water Quality

The Sacramento River has been identified as providing a number of beneficial uses including municipal, agricultural, and recreational water supply, and fish and wildlife habitat. Water quality in the river is affected by a number of sources including agricultural runoff, mining activities, stormwater runoff, erosion, and treated wastewater discharges. The Sacramento River is listed as impaired under the 303(d) list of the CWA for chlordane, DDT, dieldrin, mercury, PCBs, and unknown toxicity.[6]

C. Standards of Significance

The Specific Plan would have a significant impact with regard to hydrology and water quality if it would:

1. Violate any water quality standards or waste discharge requirements.
2. 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).
3. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site.
4. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site.

[6] State Water Resources Control Board, 2010. *Integrated Report (Clean Water Act Section 303(d) List/305(b) Report).*

5. 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.
6. Otherwise substantially degrade water quality.
7. 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.
8. Place within a 100-year flood hazard area structures which would impede or redirect flood flows.
9. 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.
10. Inundation by seiche, tsunami, or mudflow.

D. Impact Discussion

This section is based on the revised the Storm Drain Modeling Study by Phillippi Engineering, Inc. (PEI) prepared for the Specific Plan in March 2011, revised, on the basis of the peer review by West Yost, in January 2012. Copies of the West Yost report and responses from Phillippi Engineering are included in Appendix G.

1. Violates water quality standards or waste discharge requirements.

Construction related to development described in the Specific Plan would result in earth-disturbing activities such as site clearing and grading for construction of roads, parking areas, building pads, and park areas. Disturbed areas exposed to rainfall could lead to an increase in erosion and the discharge of sediment to receiving waters resulting in a degradation of water quality. Additional pollutants can be introduced during construction from vehicular use, construction materials, and construction waste products. These activities can introduce pollutants such as nutrients, metals, pesticides, oils and grease, and trash. The potential impacts of the Specific Plan on water quality during

construction are considered *significant* and could result in a violation of water quality standards.

Implementation of the Specific Plan would convert the existing agricultural lands to urban uses. Urban development creates new pollution sources including higher levels of vehicle emissions, vehicle maintenance wastes, pesticides, fertilizers, household hazardous wastes, and pet wastes. As a result, the runoff from an urban area may have a higher concentration of pollutants than the pre-development runoff from the same area. The applicant plans to construct a detention basin that would provide both stormwater quality treatment and flood control storage for the runoff from the Specific Plan area.

To provide stormwater quality treatment, a detention basin must detain stormwater for a period of time before it is discharged to the downstream receiving waters. The detention time allows particles and the associated pollutants to settle out. The minimum detention time required to achieve sufficient pollutant settling typically ranges from 24 to 48 hours. Based on the hydrologic modeling prepared as a part of the Storm Drain Modeling Study, it appears that the detention basin and the associated pump station have not been configured to provide sufficient settling time to achieve adequate stormwater quality treatment.[7] The hydrologic model indicates that the first 20 cfs pump would turn on as soon as the basin begins to fill. This would not allow for sufficient detention time during small and medium storm events. This could result in a *significant* impact to water quality downstream of the project, which would violate the terms of the City's NPDES stormwater permit. However, the design of the detention basin can be modified to provide the appropriate settling time for stormwater quality treatment. As described in the mitigation measures below, the project application would be required to modify the detention basin design to address this issue.

[7] Phillippi Engineering, Inc., 2011. *Storm Drain Modeling Study*.

Impact HYDRO-1: Construction activities could substantially degrade water quality resulting in a violation of water quality standards, and, thus, a *significant* impact.

Mitigation Measure HYDRO-1: The applicant shall comply with the NPDES General Permit for Discharges of Storm Water Discharge Associated with Construction Activities issued by the SWRCB. The Construction General Permit requires the development and implementation of a SWPPP. The SWPPP must contain a site map(s) which shows the construction site perimeter, existing and proposed buildings, lots, roadways, stormwater collection and discharge points, general topography both before and after construction, and drainage patterns across the project. The SWPPP must list BMPs the discharger will use to protect storm water runoff and the placement of those BMPs. Additionally, the SWPPP must contain a visual monitoring program; a chemical monitoring program for "non-visible" pollutants, to be implemented if there is a failure of BMPs; and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment.

BMPs to prevent or reduce potential erosion control could include mulch covering, temporary seeding, soil stabilizers, binders, fiber rolls, temporary vegetation, and permanent seeding. BMPs to control sediment that may be introduced into runoff could include silt fences, straw wattles, and sediment basins. BMPs for controlling run-on and runoff could include control berms and swales that direct runoff away from sensitive areas. Source control BMPs that prevent pollutants from entering runoff could include establishment of vehicle fueling and maintenance areas and material storage areas that are either covered or are designed to control runoff.

Significance After Mitigation: Provided that appropriate BMPs are followed to prevent erosion, control sediment, control runoff, and prevent pollutants from entering runoff during construction of the project, the impact would be reduced to *less than significant*.

Impact HYDRO-2: Runoff generated from the urban land-uses proposed with the Specific Plan area would drain into a detention basin that has not been configured to allow adequate settling time to achieve adequate stormwater quality treatment. The runoff could therefore substantially degrade water quality, resulting in a violation of water quality standards and a *significant* impact.

Mitigation Measure HYDRO-2: The applicant shall incorporate the City's Design Standards and Best Management Practices into the Specific Plan development standards and project design to reduce urban pollutants in runoff in accordance with the requirements of the City's Storm Drain Design Standards, the City's Stormwater Management Plan, and the City's latest NPDES stormwater permit. Design of projects under the Specific Plan shall incorporate design features such as minimizing to the extent feasible impervious surfaces and maximizing to the extent feasible areas that are landscaped. The applicant may use the proposed detention basin as a BMP to provide stormwater quality treatment by modifying the design of the basin to meet the requirements of an extended detention basin or other accepted water quality treatment design in accordance with the requirements of the latest City design standards and NPDES requirements when the project is implemented.

Extended detention basins reduce pollutants in runoff by allowing particles and associated pollutants to settle. Other viable BMPs include infiltration techniques such as infiltration trenches and infiltration basins. Infiltration type BMPs allow runoff to infiltrate into the underlying soil, which filters out pollutants. Infiltration techniques are not appropriate in areas with highly pervious soils (Hydrologic Soils Types A and B), so the suitability of infiltration techniques for the Specific Plan area will depend on specific soil conditions. Biofiltration BMPs include vegetated swales and buffer strips and bioretention. These types of BMPs reduce pollutants in runoff by filtering the vegetation and subsoil and infiltration into the underlying soils. Source control BMPs, which prevent pollutants from entering runoff, include directing roof spouts to pervious ar-

eas, use of porous pavements, enclosing trash storage areas, and providing signs at storm drain inlets to educate the public. Design criteria for these types of BMPs can be found in the California Storm Water Best Management Practices Handbook, New Development and Redevelopment, California Stormwater Quality Association, January 2003.

Significance After Mitigation: Provided that BMPs are implemented to reduce the potential for pollutants to enter runoff and to remove pollutants from runoff to the Maximum Extent Practicable, the impact would be reduced to *less than significant*.

2. Substantially depletes groundwater supplies or substantially interferes with groundwater recharge.

a. Substantially deplete groundwater supplies

As required by State law (SB 610), a Water Supply Assessment Report (WSAR) has been prepared for the Brighton Landing Specific Plan and was approved by the Vacaville City Council on April 24, 2012.[8] The WSAR describes the City's existing and future sources of groundwater based on the 2010 Urban Water Management Plan analysis of safe yield production rates of groundwater. The WSAR assumes that the City could pump from 7,000 acre-feet/year (afy) under normal conditions in the near future, and up to 9,700 afy under multiple dry year conditions by the year 2035 as more wells come online. The Brighton Landing Specific Plan would use a total of 660 afy, or 585,741 gallons per day (gpd). It is not possible to calculate exactly how much of this water would be groundwater versus surface water, because groundwater and surface water are mixed together in the City's water distribution system, and the proportion of water from various sources varies based on time of year and which groundwater wells are online. However, the WSAR concludes that "groundwater and surface water supplies are projected to meet or exceed projected water demands [, including the Brighton Landing

[8] Nolte Associates, *SB610 Water Supply Assessment Report for Brighton Landing*, April 2012.

Specific Plan project,] even under extended drought conditions."[9] Therefore the project would not be expected to substantially deplete groundwater supplies, and the impact would be *less than significant*.

b. Substantially interfere with groundwater recharge

The Specific Plan area is approximately 9.5 million square feet and is currently largely undeveloped. Although a substantial part of the area would be taken up by school playing fields and landscaping, much of it would be covered in impervious surfaces such as pavement for roads, driveways, and sidewalks, as well as the roofs of new homes and other buildings. An increase in impermeable surfaces and diversion of stormwater into storm drains has the potential to reduce the amount of water that may percolate to the unconfined shallow groundwater aquifer in the area Although the Vacaville area relies on groundwater pumping for some of the drinking water and irrigation water use, such pumping is not from the unconfined aquifer but from a deeper confined aquifer. This deep confined aquifer is generally recharged with water from the Sierra Nevada Mountains as the flow of water in this formation is from east to west. Any potential reduction in groundwater recharge to the confined shallow aquifer resulting from development on the Specific Plan site would be a *less than significant* impact.

3. Substantially alters existing drainage pattern resulting in substantial erosion or siltation.

The Specific Plan would convert the existing agricultural lands to residential, commercial, school, and park land uses. This would increase the impervious surfaces in the Specific Plan area and would significantly alter the existing drainage pattern, which would cause an increase in the peak flows and volumes discharged from the area during storm events.

According to the revised hydrologic modeling prepared by Phillippi Engineering, without construction of the detention basin, development of the watershed would increase the 10-year peak flow from 457 cfs to 585 cfs and

[9] Nolte Associates, *SB610 Water Supply Assessment Report for Brighton Landing*, April 2012, page 29.

100-year peak flow from 720 cfs to 882 cfs.[10] The increased flows could result in substantial erosion or siltation downstream if they were discharged directly to the downstream receiving water. However, the Specific Plan would construct a detention basin east of the Specific Plan area boundary that would detain storm flows. Flows from the Specific Plan area are to be conveyed into the detention basin via an underground pipe network for storms up to the 10-year event. For larger storms, flows in excess of the pipe system capacity would be conveyed overland in the streets and directed into the detention basin. A pump station constructed at the detention basin would discharge flows from the basin at rates well below the watershed's existing peak flow rates. According to the aforementioned revised modeling, with the detention basin, the 10-year and 100-year peak flows from the watershed would be 192 cfs and 254 cfs, respectively. As a result, the proposed detention basin would prevent the Specific Plan from causing a significant impact due to an increase in erosion or siltation downstream. However, there is insufficient detail included in the storm drainage study to ensure that all flows, including those in excess of the pipe system, would be adequately directed into the detention basin. Therefore, the possibility for increased downstream erosion or siltation is considered a *significant* impact.

Impact HYDRO-3: Increased runoff generated from the urban land-uses proposed with the Specific Plan could cause an increase in erosion or siltation downstream of the Specific Plan area if runoff is not adequately conveyed to the proposed detention basin, thus representing a *significant* impact.

Mitigation Measure HYDRO-3: See Mitigation Measure HYDRO-5.

Significance After Mitigation: Provided that a Storm Drain Master Plan is prepared to meet the requirements specified in Mitigation Measure HYDRO- 5, the impact would be *less than significant*.

[10] Phillippi Engineering, Inc., 2011. *Storm Drain Modeling Study*. These flow values were determined after corrections and refinements were made to the study by Phillippi Engineering in January 2012.

4. Substantially alters existing drainage pattern or increases the rate or amount of surface runoff resulting in flooding.

The topography in the Specific Plan area is predominantly flat, but slopes slightly to the south and east. With development of the proposed Specific Plan, runoff would continue to flow to the south and east and would be conveyed to the proposed detention basin. There are no existing storm drainage facilities within the Specific Plan area that would be obstructed by construction of the proposed Specific Plan. Therefore, it is not expected that the project would alter drainage patterns or increase the rate or amount of runoff in a way that would affect flooding upstream of the site.

As discussed previously, development of the Specific Plan would significantly increase the stormwater runoff rates in the watershed without construction of the detention basin. The 10-year peak flow would be increased from 457 cfs to 555 cfs and 100-year peak flow from 720 cfs to 882 cfs.[11] These flow increases could exacerbate the existing flooding problem downstream of the project that has been identified by FEMA. However, the Specific Plan would include a detention basin at the downstream end of the project that is sized adequately to detain a 100-year storm event. The detention basin would detain storm flows and pump them out at a rate well below the 10-year peak flow. Detention basins have been used effectively for this purpose on numerous projects within the City and this is an acceptable approach for mitigating the potential impacts of the Specific Plan on downstream flooding. However, the storm drainage report prepared for the Specific Plan does not provide sufficient detail to determine whether the Specific Plan drainage facilities would direct all flows, including overland flows during the 100-year storm, into the basin. As a result, the possibility of increased flooding downstream is considered a *significant* impact

Impact HYDRO-4: Increased runoff generated from the urban land uses proposed with the Specific Plan could cause an increase in flooding down-

[11] These flow values were determined after corrections and refinements were made to the study by Phillippi Engineering.

stream of the Specific Plan area if runoff is not adequately conveyed to the proposed detention basin.

Mitigation Measure HYDRO-4: The applicant shall have a Storm Drain Master Plan (SDMP) prepared by a registered civil engineer that identifies the specific improvements that would mitigate the increased runoff from the Specific Plan area. The SDMP shall provide the necessary calculations to adequately demonstrate that the proposed drainage facilities adequately convey the design runoff from the Specific Plan area and adequately mitigate the impacts of increased runoff. In accordance with the City's Storm Drain Design Standards, the SDMP shall be prepared and incorporated into the tentative map design and shall include, but is not limited to, the following items:

- A topographic map of the drainage shed and adjacent areas as necessary to define the study boundary. The map shall show existing and proposed ground elevations (including preliminary building pads), with drainage sub-shed areas in acres, and the layout of the proposed drainage improvements.
- A map showing analysis points, proposed street grades, storm drainage facilities, and overland release paths with required easement locations for overland flow across private property.
- Preliminary pipe sizes with hydraulic grade lines, design flows, inverts, and proposed ground elevations at analysis points. This information is to be provided on the map showing the layout of the proposed drainage facilities.
- Information on the proposed detention basin and pump station including:
  - Preliminary Grading Plan showing the layout, configuration, and elevations.
  - Preliminary Stage, storage, and discharge information for selected design storms.

- Description of storage requirements, operation, and pumping operation to provide water quality benefits, route storm runoff, and depict dry weather operation.
- Preliminary site plan for the detention facilities, and sizing and layout for the pump station.

Significance After Mitigation: Provided that a SDMP is prepared and design features incorporated into the Specific Plan and tentative map, the impact would be *less than significant*.

5. Creates or contributes runoff water exceeding stormwater drainage system capacity or provides substantial additional polluted runoff.

The Specific Plan would significantly increase the amount of impervious cover in the Specific Plan area, which would cause a significant increase in runoff rates compared to existing rates. The Specific Plan would include a detention basin downstream of the Specific Plan area boundary that would mitigate potential increases in flow and would also provide stormwater quality treatment. On-site runoff from the Specific Plan would be conveyed to the detention basin via an underground pipe network that would be constructed in accordance with the City's Standard Specifications and Drawings.[12] The pipe sizes would vary from 15 to 72 inches in diameter. The proposed pipe network would be sized to convey the peak flow from the 10-year storm in accordance with the City standards. Flows from storms larger than the 10-year event must be safely conveyed overland in the streets to the detention basin. City standards require the flow from the 100-year storm water surface elevation to be no more than a ½-foot above the centerline elevation of a road and must be at least 1-foot below building pads. Detailed pipe sizing calculations and overland release calculations are not included in the project drainage report and the adequacy of the proposed on-site systems could not be evaluated. Therefore, the possibility for the proposed on-site stormwater system to be exceeded by a storm event is considered a potentially *significant* impact.

[12] Phillippi Engineering, Inc., 201. *Storm Drain Modeling Study.*

Impact HYDRO-5: The Specific Plan could create runoff water that exceeds the proposed storm drain system and the existing downstream system, which would be a *significant* impact.

Mitigation Measure HYDRO-5: See Mitigation Measure HYDRO-4.

Significance After Mitigation: Provided that a SDMP is prepared to meet the requirements outlined in Mitigation Measure HYDRO-5, the impact would be *less than significant*.

6. Substantially degrades water quality.

Construction activities could lead to an increase in erosion and the discharge of sediment from the site. Construction activities also introduce other pollution sources that could increase the concentration of pollutants in site runoff. Therefore, construction activities could result in a temporary degradation of water quality, which is a *significant* impact.

Urban development can cause an increase in the pollutant concentration of runoff from a watershed compared to pre-developed conditions. The Specific Plan intends to mitigate for the potential stormwater quality impacts by constructing a detention basin downstream of the Specific Plan area. However, the proposed configuration of the detention basin as described in the storm drainage study would not provide a sufficient detention time to achieve adequate treatment.[13] Therefore, the possibility of the Specific Plan to degrade water quality is considered a potentially *significant* impact.

Impact HYDRO-6: Runoff generated from the urban land-uses proposed with the Specific Plan could substantially degrade water quality.

Mitigation Measure HYDRO-6: See Mitigation Measure HYDRO-2.

[13] Phillippi Engineering, Inc., *Storm Drain Modeling Study*, March 2011.

Significance After Mitigation: Provided that BMPs are followed as described in Mitigation Measure HYDRO-2, the impact would be reduced to *less than significant*.

7. Places housing within a 100-year flood hazard area?

Based on the FEMA Flood Insurance Rate Map (Panel 06095C0281E, May 4, 2009), the Specific Plan would not place housing with a 100-year flood hazard area and there would be *no impact*.

8. Places structures within a 100-year flood hazard area resulting in impeded or redirected flood flows?

Based on the FEMA Flood Insurance Rate Map (Panel 06095C0281E, May 4, 2009), the Specific Plan would not place structures within a 100-year flood hazard area and there would be *no impact*.

9. Exposes people or structures to significant risks involving flooding?

In response to SB 5, the California Department of Water Resources has prepared preliminary (i.e. Best Available) maps depicting the estimated 200-year floodplain for the Sacramento-San Joaquin Valley. These best available maps were reviewed and the Specific Plan area was determined to be outside of a known 200-year floodplain.

The Specific Plan would increase peak flows and runoff volumes generated within the Specific Plan area. On-site flows would be collected in an underground storm drain system and conveyed to a detention basin. Flows in excess of the pipe system would flow to the detention basin in streets. The detention basin would provide flood control storage that would serve to mitigate for the Specific Plan's potential impacts downstream. The storm drainage study for the Specific Plan lacks sufficient detail to determine if the proposed storm drainage pipe system and overland flow paths would effectively deliver runoff to the detention basin without producing flooding within the project. Therefore, the possibility that the Specific Plan exposes people to flooding within and downstream of the Specific Plan is considered a potentially *significan*t impact.

Impact HYDRO-7: The Specific Plan could expose people or structures to *significant* flood risks within and downstream of the Specific Plan area.

Mitigation Measure HYDRO-7: See Mitigation Measure HYDRO-4.

Significance After Mitigation: Provided that a Storm Drain Master Plan is prepared to meet the requirements specified in Mitigation Measure HYDRO-5, the impact would be *less than significant*.

10. Inundation by seiche, tsunami, or mudflow?

The Specific Plan area is not located in an area near to a large water body or steep erodible hillside that is subject to inundation by seiche, tsunami, or mudflow and there would be *no impact.*

E. Cumulative Impacts

The Specific Plan and other potential cumulative projects in the vicinity of the Specific Plan area, including growth resulting from either development of the 1990 General Plan or development of the Proposed General Plan Update, could have impacts, individual and cumulative, to water quality during and after construction. The cumulative projects could also cause increases in run-off rates which could increase the risk of flooding. Therefore, cumulative impacts resulting from the proposed Specific Plan and other future growth are *significant*.

The Specific Plan will be required to comply with the City's NPDES stormwater permits (Statewide MS4 and Construction permits) from the CVRWQCB and the City's Stormwater Management Plan, which are designed to prevent or minimize impacts to water quality during and after construction of the project. The Specific Plan also incorporates a proposed detention basin into the project plans and will be required to mitigate for other potential impacts related to stormwater runoff rates and flooding. The implementation of mitigation measures for the Specific Plan will reduce the con-

tribution of the Specific Plan toward potential cumulative impacts to a *less-than-significant* level.

The Specific Plan area represents one development added to several recently approved projects, and general buildout under the 1990 Existing General Plan, or the Proposed General Plan Update. The reduction in groundwater recharge resulting from development on the Specific Plan site in addition to this surrounding development would also be a *significant* cumulative impact.

Impact HYDRO-CUM-1: The additional area of impervious surface from roads, buildings, and other hardscape features would reduce the quantity of water that reaches the aquifer.

Mitigation Measure HYDRO-CUM-1: See Mitigation Measure HYDRO-3.

Significance after Mitigation: With provision of additional project features to minimize runoff that is taken off-site through the storm drain system, the project's contribution to any regional impact would be *less than significant.*

4.10 LAND USE AND PLANNING

A. Regulatory Framework

This chapter includes a summary of relevant land use plans and policies, a description of the existing land uses in the vicinity of the Specific Plan area and an analysis of the potential impacts the Specific Plan may have on those land uses.

1. Regional Agencies and Regulations

This section describes regional agencies and regulations that pertain to land use in Vacaville.

a. Solano County General Plan

The Solano County General Plan, adopted on August 5, 2008, is a long-range guide for land use in the unincorporated areas in the county, including land outside of Vacaville's city limits but within the General Plan Planning Area.[1] The Specific Plan area is surrounded on three sides by land governed by the Solano County General Plan. Among other things, the Solano County General Plan seeks to:

- Establish buffers between urban uses and agriculture with a minimum width of 300 feet (Policy AG.I-5).
- Encourage, protect, and maintain buffers between urban uses and agriculture (LU.I-16, LU.P-11, AG.P-16).
- Allow development in municipal service areas within existing unincorporated communities under County jurisdictions (LU.P-10).
- Require minimum setbacks, including for lined ponds or basins.

The County General Plan describes agricultural buffers as strips of vegetated land, typically 300 to 500 feet, located within city municipal service areas that are used to help reduce complaints due to normal agricultural operations near residential areas. With appropriate vegetation management, the buffer can also prevent pesticide drift resulting from agricultural spraying.

[1] Solano County, 2008, *General Plan*.

b. Solano County Zoning Code

The proposed detention basin and part of the agricultural buffer would be located within Solano County's jurisdiction in an area zoned Agricultural. The Solano County Zoning Code requires building permits for any construction and use permits for utility facilities or infrastructure outside of the right-of-way in the Agricultural zone. The County Zoning Code does stipulate permitted and unpermitted uses for the Agricultural Buffer designation.

c. Solano County Airport Land Use Commission

The Solano County Airport Land Use Commission (ALUC) guides airport development in the county and governs the area surrounding airports to prevent issues relating to noise and safety. Additionally, the ALUC prepares Airport Land Use Compatibility Plans (ALUCPs) and ensures that cities within Solano County have policies and regulations in compliance with ALUP provisions.

i. Nut Tree Airport Land Use Compatibility Plan

The Specific Plan area, which is approximately 2 miles south of the Nut Tree airport is not within any Nut Tree ALUCP compatibility zones and thus would not require Solano County ALUC review and does not trigger ALUP regulations and policies.

ii. Travis Air Force Base Land Use Compatibility Plan

Travis Air Force Base is approximately 5 miles south of the Specific Plan area. The Specific Plan area falls within Travis Air Force Base ALUCP Compatibility Zone D.[2] ALUC review is mandatory for Specific Plans located on property within an airport influence area or compatibility zone.[3,4] Addition-

[2] Solano County, 2002. *Travis Air Force Base Land Use Compatibility Plan*, page 2-17.

[3] Solano County, 2004. *Solano County Airport Land Use Compatibility Review Procedures*, page 2-5.

[4] Solano County, 2010. *Nut Tree Airport Master Plan*, page B.21.

ally, Compatibility Zone D requires ALUC and Federal Aviation Administration (FAA) review of structures with a proposed height over 200 feet.[5]

2. City Regulations and Policies

This section describes City regulations and policies that pertain to land use in Vacaville.

a. Vacaville 1990 General Plan

The 1990 General Plan (existing General Plan) addresses Vacaville's future land uses, primarily through the Land Use Element, which establishes land use policies and maps the location of future land uses. This section summarizes the land use designations and map, Land Use Element policies, and policies related to land use provided in other elements of the 1990 General Plan.

i. General Plan Land Use Designations

The Land Use Element describes the general distribution of land uses and the density and intensity of development within Vacaville. There are three 1990 General Plan land use designations within the Specific Plan area, each of which is discussed below. These land use designations are shown in Figure 4.10-1.

- Agricultural Buffer: Designates areas suitable for transitional uses compatible with urban development on one edge and agriculture on the other. Urban density may be transferred from the agricultural buffer to the adjacent residential site.
- Agriculture: Designates areas suitable for agricultural purposes, primarily irrigated croplands and pasture.
- Residential Estate: Designates areas suitable for very low-density residential land use ranging from 0.5 to 3 units per acre.

[5] Solano County, 2002. *Travis Air Force Base Land Use Compatibility Plan*, page 2-13.

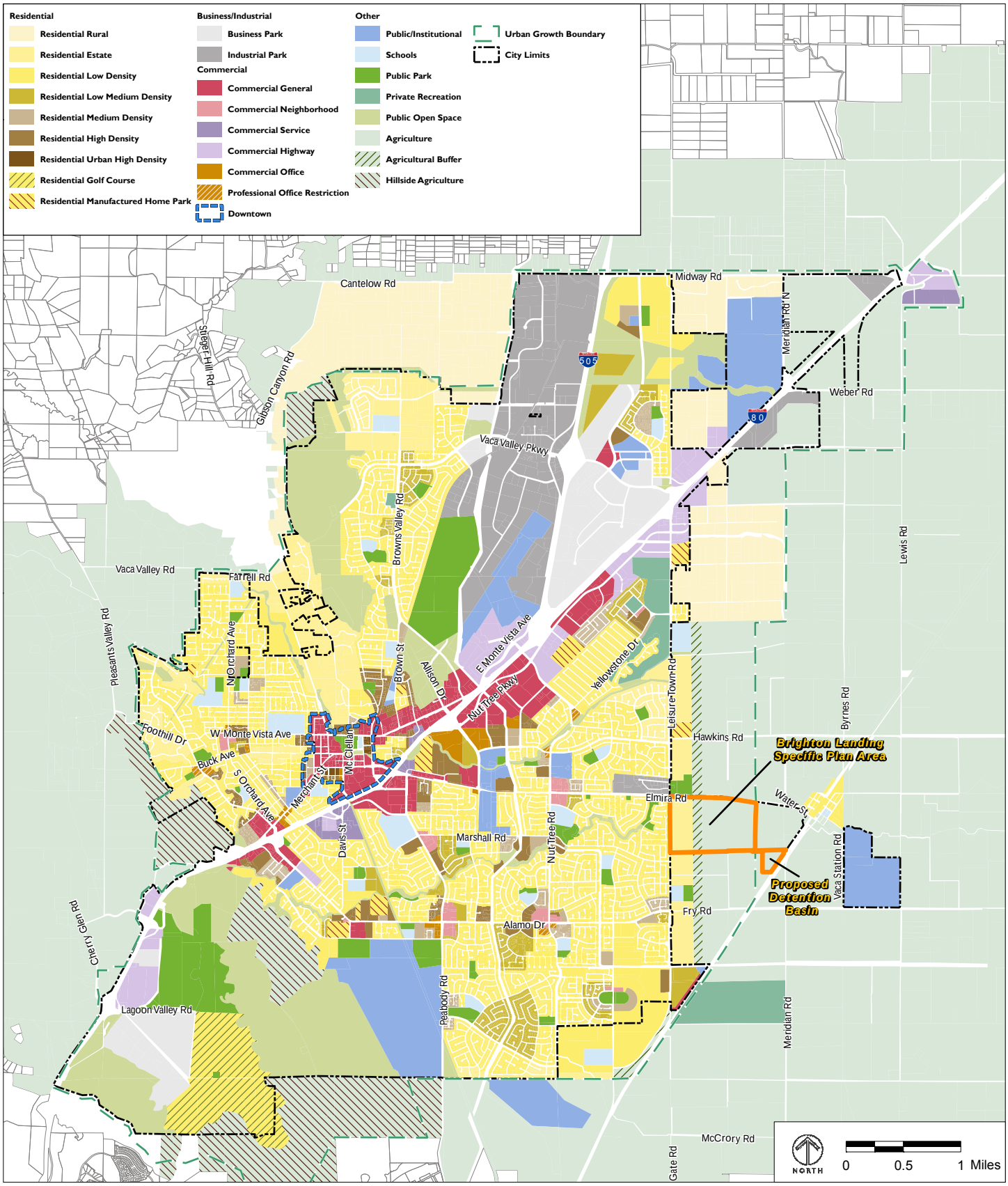


FIGURE 7
EXISTING GENERAL PLAN LAND USE MAP

ii. 1990 General Plan Policies

The 1990 General Plan establishes goals, policies, and programs to guide development within the city. The goals and policies of the 1990 General Plan Land Use Element that are relevant to the Specific Plan are included in Table 4.10-1 with an analysis of the consistency between the Specific Plan and these policies.

b. Proposed General Plan Update

An update to the 1990 General Plan is underway and a Preferred Land Use Alternative has been chosen by the City Council. This is included in Appendix D.

c. Vacaville Municipal Code

The Land Use and Development Code, Title 17 of the Municipal Code, applies zoning districts to properties within the City of Vacaville. The purpose of the zoning districts is to implement the land use designations established by the General Plan. For each General Plan land use designation, there is, at a minimum, one zoning district. The Specific Plan area is zoned as Agriculture (AG) and allows land uses consistent with or related to the commercial raising of produce and livestock.

B. Existing Conditions

Of the 218-acre Specific Plan area, approximately 212 acres are in active agricultural use. In addition, inside Area O in the northwest corner of the Specific Plan area, as shown on Figure 3-8, there are two small parcels totaling approximately 6 acres with existing residential single-family houses. A third parcel in Area O is owned by the City of Vacaville and is currently vacant. Leisure Town Road would be widened and become Jepson Parkway in a

TABLE 4.10-1 **POLICY CONSISTENCY**

Policy Number	Policy	Consistency
Vacaville 1990 General Plan Policies		
Policy 2.1-G1	Maintain Vacaville as a free-standing community surrounded by foothills, farmland, and other open space.	Consistent with agricultural mitigation. The Specific Plan would eliminate farmland surrounding the city in the Specific Plan area, but would preserve an equivalent amount of farmland within one-mile of the Urban Growth Boundary.
Policy 2.1-G4	Minimize conflicts between agriculture and urban uses and provide for a transitional area or buffer between agricultural and urban uses.	Consistent. The Specific Plan proposes an agricultural buffer between agricultural uses and the residential development.
Policy 2.1-G8	Preserve the predominant single-family residential character of Vacaville while providing other housing opportunities. Protect established neighborhoods from incompatible uses.	Consistent. The proposed development is primarily devoted to single-family residential homes and protects neighborhoods from incompatible uses with an agricultural buffer.
Policy 2.1-G10	Protect the natural environment that the City enjoys and use creeks, hills, utility corridors, viable agricultural lands, or other significant natural features wherever appropriate to establish ultimate City boundaries.	Consistent. The Specific Plan area is located along the easternmost boundary of the city and would remain bounded by natural features on three sides.
Policy 2.1-I7	Maintain and replace, as necessary, lighting and landscaping on the City's streets.	Consistent. Proposed lighting and landscaping features along Leisure Town Road, Elmira Road and proposed new roads are detailed within the Specific Plan.
Policy 2.1-I12	Land use changes and development proposals within the Vacaville planning area shall be consistent with the Nut Tree Airport Land Use Plan and the Travis Airport Land Use Compatibility Plan and are subject to review per the Solano County Airport Land Use Compatibility Review Procedures.	Consistent upon Specific Plan approval. The Specific Plan will be reviewed by the ALUC for compatibility prior to approval.
Policy 2.2-I9	Require that Planned Developments, specific plans, or policy plans be prepared for new areas brought into the City for development, and continue to revise existing policy plans to conform to General Plan policies and requirements for infrastructure financing mechanisms and open space.	Consistent. The applicant has prepared a Specific Plan for the development of a previously undeveloped area.

TABLE 4.10-2 POLICY CONSISTENCY (CONTINUED)

Policy Number	Policy	Consistency
Policy 2.2-I12	Allow development to occur only in new outlying development areas with required Planned Developments, specific plans, or policy plans as part of a coordinated plan for land uses, public facilities, and public services. Individual, piecemeal developments within these areas are not permitted.	Consistent. The applicant has provided a Specific Plan which considers land uses, public facilities, and public services.
Policy 2.5-G2 (2.5-I 3)	Provide a citywide housing mix of approximately 60 percent single-family detached, 20 percent single-family with zero lot lines, duplexes, triplexes, mobile homes, and townhouses, and 20 percent garden apartments and condominiums. To achieve this approximate housing mix citywide, new development areas must contain a larger component of certain housing types, as specified in Policy 2.5-I 3.	Inconsistent. The Specific Plan housing is entirely composed of single-family homes—not a mix as specified by this policy. Citywide planning would therefore need to redress the balance by providing proportionately more Medium and High Density Residential areas in other locations. The Specific Plan does not provide the housing mix stipulated in Policy 2.5-I3 which requires developments with greater than 400 units to have at least ten percent each of larger lots and homes and at least ten percent of units with Residential Medium or Residential High densities. In contrast, the Specific Plan does not specify larger lots and homes and all densities are Residential Low or Residential Low Medium. However, the Specific Plan does call for a variety of house plan types and delineates a range of lot sizes from 3,600 square feet to 6,000 square feet.
Policy 2.5-G4	Broaden the choice of type, size, and affordability of single-family homes.	Consistent. The Specific Plan proposes adding 769 single-family homes to Vacaville in a range of types.
Policy 2.5-G6	Provide for a transition between higher-density and lower-density housing and require buffers between residential and incompatible land uses.	Consistent. There is a proposed agricultural buffer in the Specific Plan between residential and agricultural uses.
Policy 2.5-G8	Locate major residential areas with easy access to employment concentrations.	Consistent. The Specific Plan area is approximately two miles southeast of Interstate 80, a major thoroughfare providing easy access to employment centers within Vacaville and in nearby cities.
Policy 2.5-I1	Maintain adopted regulations to ensure residential densities remain within the ranges designated on the General Plan map based on the characteristics of each site and its surroundings and on General Plan policies. Require that all development be subject to site development and design review.	Inconsistent. The General Plan map designates this area as Agriculture, Agricultural Buffer, and Residential Estate—with the highest density set at 3 units per acre. In contrast, the Specific Plan's lowest proposed density is 4.8 units per acre and has an average density of 5.4 units per acre.[6]

[6] If the corner parcel, which has several proposed options, were to be developed with the proposed residential option, it would have a proposed density of 2.72 units per acre.

TABLE 4.10-2 POLICY CONSISTENCY (CONTINUED)

Policy Number	Policy	Consistency
Policy 2.5-I6	Locate lower-density housing at the edge of the planned urban area to buffer rural residential from higher urban density housing.	Consistent. All housing proposed for the Specific Plan area, which lies at the edge of the planned urban area, would fall under General Plan categories Residential Low or Residential Low Medium.
Policy 2.5-I8	Maintain buffers between residential and agricultural areas and between residential areas and industrial parks as required by adopted regulations and Policy Plans. The minimum separation shall be as follows: Between residential and agricultural uses: 500 feet. Standards for walls and landscaping and compatible uses permitted within the buffer area are defined in the Land Use and Development Code and Policy Plans. The Planning Commission may reduce this standard upon review and approval of a Planned Development where design features such as solid masonry walls and appropriate building setbacks are provided. In addition, Disclosure Statements and Right to Farm Deed Restriction may also be required. (Where the Agricultural Buffer borders the Cypress Lakes Golf Course, the width shall be determined by the noise and safety buffer requirements for the Southern Pacific Rail Road. See also Policy 10.6-I14 in the Noise Element.) Between residential, business, and industrial park uses: 200 feet.	Consistent. There is a proposed agricultural buffer in the Specific Plan between residential and agricultural uses.
Policy 2.5-I14	Design residential neighborhoods to avoid fronting on major streets expected to carry inter-neighborhood or community traffic.	Consistent. The Specific Plan details that proposed residential units will not front on major collector roads.
Policy 2.10-G3	Locate shopping centers and neighborhood commercial facilities at the intersection of major thoroughfares, and, where appropriate, adjacent to multifamily housing, and minimize conflicts between commercial areas and residences by requiring adequate buffers and screening.	Consistent. The only neighborhood commercial development proposed in the Specific Plan would be located at the intersection of two major thoroughfares, Leisure Town Road and Elmira Road.

Note: Shading indicates inconsistency with the General Plan.
Source: City of Vacaville, March 2008, *General Plan*, Land Use Element.

project that has already received approval and has the appropriate environmental documentation.[7]

The Specific Plan area is surrounded by agricultural uses to the north, east, and south and by established single-family neighborhoods to the west. To the northwest there is a small area of Commercial and Industrial Uses, including a City-owned pumping station. Alamo Creek crosses the northwestern corner of the Specific Plan area. It is proposed to be culverted as part of the Jepson Parkway Project.

C. Standards of Significance

The proposed Specific Plan would have a potentially significant land use and planning impact if it would:

1. Physically divide an established community.
2. Conflict with any applicable plan, policy, or regulation of a government agency with jurisdiction over land within the City of Vacaville or its Sphere of Influence that has been adopted for the purpose of avoiding or mitigating an environmental effect.
3. Conflict with any applicable habitat conservation or natural community conservation plan.

D. Project Impacts

This section contains an analysis of the potential land use impacts associated with implementation of the proposed Specific Plan.

[7] State of California Department of Transportation and the Solano Transportation Authority, 2011. *Jepson Parkway Project Final Environmental Impact Statement and Section 4(f) Evaluation.*

1. Physical Division of an Established Community

The Specific Plan would have a significant environmental impact if it would divide the physical arrangement of an established community. The Specific Plan area is located east of an established community across Leisure Town Road. The Specific Plan area is currently devoted to agriculture, as is adjacent land to the north, south, and east. Development under the Specific Plan would create a developed "peninsula" within agricultural land

The Specific Plan would add a new residential neighborhood with two schools. It would be connected to the existing neighborhood across Leisure Town Road at Elmira Road and at the new east-west connector on the southern side. This would help to physically connect, rather than divide, the existing neighborhood to the proposed new neighborhood. Implementation of the Specific Plan would not add any physical structures or features that would create a physical division.[8] Additionally, the Specific Plan proposes a non-vehicular circulation system including a series of paths and walkways for pedestrians and bicyclists which will provide alternative methods of connecting to adjacent neighborhoods. Implementation of the Specific Plan would therefore have a *less-than-significant* impact.

2. Conflict with Land Use Plans, Policies, or Regulations

a. Land Use Plans

Besides the Vacaville General Plan, the only land use plan that is applicable to the Specific Plan is the Travis Air Force Base ALUCP. All of the Specific Plan area is within Compatibility Zone D, which triggers ALUC review of the Specific Plan. Additionally, as mentioned earlier, for this zone FAA review is required for any structure over 200 feet in height.

Building heights would be limited to those specified in the City Zoning regulations applicable to the new land use designations that would be adopted as

[8] The Jepson Parkway project will create a divided highway in the area before the Specific Plan would be implemented, and the smaller east-west streets such as Fallbrooke Drive and Kingswood Drive would not cross the Parkway to connect to streets in the Specific Plan area.

part of the Specific Plan approval process. Upon Zoning Map approvals the Specific Plan would comply with City height requirements, which in turn, must comply with ALUCP requirements. Zoning Map amendments[9] would be reviewed by the ALUC for compatibility by City staff. Therefore, the Specific Plan would comply with ALUCP requirements and impacts related to applicable land use policies and regulations (i.e. the ALUCP), are *less than significant*.

b. Solano County General Plan Policies and Zoning Ordinance

The elements of the Specific Plan that are outside of City boundaries and under County jurisdiction are the detention basin and the proposed new sewer (which is described more fully in Chapter 4.15 Utilities). The proposed agricultural buffer would be 500 feet in width,[10] which exceeds the County's required minimum width of 300 feet. As required by the County Zoning Ordinance, the proposed detention basin would be within the Agricultural 40-acre minimum (A-40) district and surrounded by land with the same designation.[11] Uses allowed in the A-40 district include public facilities (e.g. a detention basin). If built by the private applicant, the detention basin would require use permit approval from the County. Once the applicant has obtained use and building permits, construction of the proposed detention basin and sewer would comply with existing County General Plan policies and Zoning Code. Physical impacts of these facilities are analyzed in the relevant sections of this EIR. Therefore, there would be a *less-than-significant* impact.

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[9] See Appendix B for text of proposed Zoning Map amendments.

[10] Of the 500-foot-wide agricultural buffer, 115 feet of this would be in the Specific Plan area on City land, and 385 feet outside the Urban Growth Boundary on County land.

[11] City of Vacaville, October 2010, *Alamo Creek and Ulatis Creek Detention Basins Project Draft EIR*, page 4-2-11.

Solano County, 2008, *General Plan Land Use Diagram*, http://www.co.solano.ca.us/civicax/filebank/blobdload.aspx?blobid=11013, accessed on June 18, 2012.

Solano County, Geographic Information Systems, Aerial Photography + Zoning, http://gis.solanocounty.com/solanomaps/, accessed on June 18, 2012.

c. 1990 Vacaville General Plan Policies

As required under CEQA, this analysis also examines whether the Specific Plan, as proposed, would be consistent with applicable policies, the most relevant of which are listed above in Table 4.10-1. Table 4.10-1 contains determinations of whether the Specific Plan complies with each of these policies. Policies with which the proposed Specific Plan would be inconsistent are shaded in gray in Table 4.10-1. As shown in the table, the Specific Plan would be potentially inconsistent with the following policies from the 1990 General Plan:

- Policy 2.5-G2. Provide a citywide housing mix of approximately 60 percent single-family detached, 20 percent single-family with zero lot lines, duplexes, triplexes, mobile homes, and townhouses, and 20 percent garden apartments and condominiums. To achieve this approximate housing mix citywide, new development areas must contain a larger component of certain housing types, as specified in Policy 2.5-I 3.
- Policy 2.5-I1. Maintain adopted regulations to ensure residential densities remain within the ranges designated on the General Plan map based on the characteristics of each site and its surroundings and on General Plan policies. Require that all development be subject to site development and design review.
- Policy 2.5-I3. In any development exceeding 400 units, require a mix of development types and/or densities, including a component of larger lots and homes (at least 10 percent of the total) and a component of Residential Medium or Residential High Density units (at least 10% of the total). Require developments with greater than 400 units to have at least ten percent each of larger lots and homes and at least ten percent of units with Residential Medium or Residential High densities.

The Specific Plan does not provide a housing mix as described in Policy 2.5-G2, nor as more explicitly defined in Policy 2.5-I 3. The Specific Plan proposes only detached, single-family dwelling units and does not match stated density goals. However, as part of the development approval process, the applicant must receive Specific Plan, General Plan amendment, Tentative

Map, and rezoning approval. The General Plan amendment includes an amendment to the housing mix policy exempting the Brighton Landing Specific Plan, and thus eliminating any housing mix policy conflict. The proposed project includes each of these requests in order to obtain City approval for the land use and policy actions. With Specific Plan, General Plan amendment, Tentative Map, and rezoning approval, the proposed Project would no longer conflict with existing policies and the impact would be *less than significant*.

d. Regulations

The Land Use and Development Code, Title 17 of the Vacaville Municipal Code, zones the Specific Plan area as Agriculture (AG). The Specific Plan would conflict with this regulation by developing the Specific Plan area for residential and a small area of neighborhood commercial. With a few minor exceptions regarding maximum floor to area ratios, building heights, and setbacks, as described in Chapter 3, Project Description, the Specific Plan adheres to all standards set forth in the Land Use and Development Code. Additionally, the Specific Plan confirms that all neighborhood design will participate in the Design Review process. Although the Specific Plan proposes densities higher than those designated by the 1990 General Plan map, thus conflicting with Policy 2.5-I1, after Specific Plan, Tentative Map, and rezoning approval, there would no longer be a conflict and the impact would be *less than significant*.

3. Conflict with Any Applicable Habitat Conservation or Natural Community Conservation Plan

There are no habitat conservation plans or natural community conservation plans applicable to the Specific Plan area currently available, although there is a draft Habitat Conservation Plan underway that would cover the project area. Therefore, the Specific Plan would have *no impact* on conservation plans.

E. Cumulative Impacts

1. With Approved Projects

This section analyzes potential land use impacts that could occur from a combination of the Specific Plan with other approved projects and plans in the Specific Plan vicinity. As discussed earlier, development under the Specific Plan would not physically divide an established residential community. Given the Specific Plan's location and surrounding land uses of agriculture and residential, the Specific Plan, together with approved projects and plans, is not expected to contribute to any cumulative division of established communities. Additionally, any projects or plans, including the Specific Plan itself, must comply with all applicable land use policies and habitat or conservation plans. Therefore, there would be a *less-than-significant* cumulative impact on land uses.

2. Under Existing 1990 General Plan

The proposed Project, when considered with buildout of the 1990 General Plan, would not cumulatively contribute to the division of established communities. However, as mentioned in the project impacts discussion, the proposed Project does conflict with land use policy requiring a particular housing mix and with several other City policies and regulations, which would contribute to cumulative impacts on land use policies and regulations. After project approval, which would include a Specific Plan, General Plan amendment, Tentative Map, and rezoning approval, there would no longer be a conflict with existing land use policies and regulations. Therefore, there would be a *less-than-significant* cumulative impact on land uses.

3. With Proposed General Plan Update[12]

Development, as envisioned in the Proposed General Plan Update's Preferred Land Use Alternative, would serve more to connect than to physically divide

[12] Land uses are shown on the Preferred Land Use Alternative accepted by the City Council on December 13, 2011. Although the update is in progress, and the General Plan in draft form, policies are subject to change and have not therefore been taken into account in this analysis.

established communities. The Preferred Land Use Alternative describes potential future development surrounding the Specific Plan area as primarily residential, although it also includes commercial and business/industrial uses.[13] The Preferred Land Use Alternative for the East of Leisure Town Road Growth Area, to the north and south of the Specific Plan area, including the Specific Plan area, includes residential land use designations ranging from High Density Residential to Rural Residential. The housing mix would be 33 percent low density, 64 percent moderate density, and 3 percent high density. Although this does represent a mix of housing densities, the mix is not consistent with the percentages identified in Policy 2.5-G2 of the 1990 General Plan. However, as mentioned in the project impact discussion, the General Plan amendment which would be part of the development approval process includes an amendment to the housing mix policy exempting the Brighton Landing Specific Plan, and thus eliminating any housing mix policy conflict. The proposed project includes each of these requests in order to obtain City approval Therefore, the Specific Plan would not contribute to a cumulative inconsistency with an adopted policy regarding housing mix.

[13] Preferred Land Use Alternative accepted by the City Council on December 13, 2011.

4.11 NOISE

A. Background

This section summarizes existing federal, State, and local laws, policies, and regulations that apply to noise in and around Vacaville.

This section describes the methodology used for measuring noise as well as the existing noise environment within the vicinity of the Specific Plan area.

1. Noise and Vibration Concepts

Noise is generally defined as unwanted sound. Noise consists of any sound that may produce physiological or psychological damage and/or interfere with communication, work, rest, recreation, or sleep.

To the human ear, sound has two significant characteristics: *pitch* and *loudness*. Pitch is the number of complete vibrations or cycles per second of a wave, which results in the range of tone from high to low. Loudness is the strength of a sound that describes a noisy or quiet environment. It is measured by the amplitude of the sound wave. Loudness is determined by the intensity of the sound waves combined with the reception characteristics of the human ear. Sound intensity refers to how hard the sound wave strikes an object, which in turn produces the sound's effect. This characteristic of sound can be precisely measured with instruments. Table 4.11-1 contains a list of typical acoustical terms and definitions.

a. Measurement of Sound

Sound is characterized by various parameters that describe the rate of oscillation (frequency) of sound waves, the distance between successive troughs or crests in the wave, the speed at which it travels, and the pressure level or energy content of a given sound. The sound pressure level has become the most common descriptor used to characterize the loudness (i.e. amplitude) of an ambient sound, and the decibel scale is used to quantify sound intensity.

A decibel (dB) is a unit of measurement which indicates the relative intensity of a sound. The zero point on the dB scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Changes of 3 dB or less

TABLE 4.11-1 **DEFINITIONS OF ACOUSTICAL TERMS**

Term	Definitions
Decibel, dB	A unit of measurement that denotes the ratio between two quantities proportional to power; the number of decibels is 10 times the logarithm (to the base 10) of this ratio.
Frequency, Hz	Of a function periodic in time, the number of times that the quantity repeats itself in 1 second (i.e. number of cycles per second).
A-Weighted Sound Level, dBA	The sound level obtained by use of A-weighting. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted, unless reported otherwise.
L_{01}, L_{10}, L_{50}, L_{90}	The fast A-weighted noise levels equaled or exceeded by a fluctuating sound level for 1 percent, 10 percent, 50 percent, and 90 percent of a stated time period.
Equivalent Continuous Noise Level, L_{eq}	The level of a steady sound that, in a stated time period and at a stated location, has the same A-weighted sound energy as the time varying sound.
Community Noise Equivalent Level, CNEL	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 5 decibels to sound levels occurring in the evening from 7:00 p.m. to 10:00 p.m. and after the addition of 10 decibels to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
Day/Night Noise Level, L_{dn}	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 10 decibels to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
L_{max}, L_{min}	The maximum and minimum A-weighted sound levels measured on a sound level meter, during a designated time interval, using fast time averaging.
Ambient Noise Level	The all-encompassing noise associated with a given environment at a specified time, usually a composite of sound from many sources at many directions, near and far; no particular sound is dominant.
Intrusive	The noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, time of occurrence, and tonal or informational content, as well as the prevailing ambient noise level.

Source: Harris, C.M, 1998. *Handbook of Acoustical Measurements and Noise Control.*

are only perceptible in laboratory environments. Audible increases in noise levels generally refer to a change of 3 dB or more, as this level has been found to be barely perceptible to the human ear in outdoor environments.

Since the human ear is not equally sensitive to all pitches (i.e. sound frequencies) within the entire spectrum, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity in a process called "A-weighting," expressed as "dBA." The dBA, or A-weighted decibel, refers to a scale of noise measurement that approximates the range of sensitivity of the human ear to sounds of different frequencies. Table 4.11-2 shows representative noise sources and their corresponding noise levels in dBA.

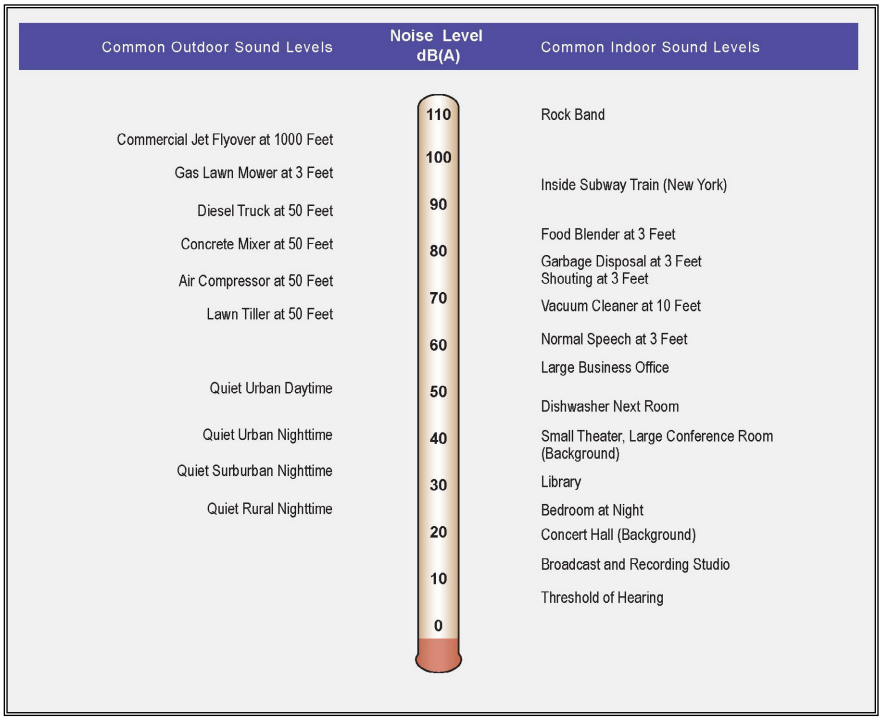
Because sound can vary in intensity by over one million times within the range of human hearing, a logarithmic loudness scale[1] is used to keep sound intensity numbers at a convenient and manageable level. Thus, a 10 dBA increase in the level of a continuous noise represents a perceived doubling of loudness, while a 20 dBA increase is 100 times more intense, and a 30 dBA increase is 1,000 times more intense.

As noise spreads from a source, it loses energy so that the farther away the noise receiver is from the noise source, the lower the perceived noise level. Noise levels diminish or attenuate as distance from the source increases based on an inverse square rule, depending on how the noise source is physically configured.

Noise level from a single point source, such as a single piece of construction equipment at ground level, attenuates at a rate of 6 dB for each doubling of distance between the single point source of noise and the noise-sensitive receptor of concern. Heavily traveled roads with few gaps in traffic behave as

[1] Unlike linear units such as inches or pounds, decibels are measured on a logarithmic scale, representing points on a sharply rising curve. The logarithmic decibel scale allows an extremely wide range of acoustic energy to be characterized in a manageable notation.

Table 4.11-2 **Typical A-Weighted Sound Levels**



Source: LSA Associates, Inc., 2009.

continuous line sources and attenuate roughly at a rate of 3 dB per doubling of distance.

There are many ways to rate noise for various time periods, but an appropriate rating of ambient noise affecting humans also accounts for the annoying effects of sound. The predominant rating scales for communities in the State of California are the equivalent continuous sound level (L_{eq}), the community noise equivalent level (CNEL), and the day-night average level (L_{dn}). L_{eq} describes the average level that has the same acoustical energy as the summation of all the time-varying events. This descriptor is useful because sound levels can vary markedly over a short period of time. The most common averaging period for L_{eq} is hourly, but it can be of any duration. CNEL is the energy

average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the A-weighted sound levels occurring between 10:00 p.m. and 7:00 a.m. (defined as sleeping hours) and 5 dB added to the A-weighted sound levels occurring between 7:00 p.m. and 10:00 p.m. (defined as relaxation hours). L_{dn} is similar to the CNEL scale, but without the adjustment for events occurring during the evening relaxation hours. CNEL and L_{dn} are normally exchangeable.

The noise environments discussed in this analysis are specified in terms of maximum levels, denoted by L_{max}; L_{max} is the highest exponential time averaged sound level that occurs during a stated time period. L_{max} reflects peak operating conditions, and addresses the annoying aspects of intermittent noise.

Noise impacts can be described in three categories. The first is an audible impact that refers to an increase in noise levels noticeable to humans. Audible increases in noise levels generally refer to a change of 3 dBA or greater, since, as described above, this level has been found to be barely perceptible in exterior environments. The second category, potentially audible, refers to a change in the noise level between 1 and 3 dBA. This range of noise levels has been found to be noticeable only in laboratory environments. The last category is a change in noise level of less than 1 dBA, which is inaudible to the human ear. Only audible changes in existing ambient or background noise levels are considered potentially significant.

b. Effects of Noise

According to the US Department of Housing and Urban Development's 1985 Noise Guidebook, permanent physical damage to human hearing can occur at prolonged exposure to noise levels higher than 85 to 90 dBA. Exposure to high noise levels affects our entire system, with prolonged noise exposure in excess of 75 dBA increasing body tensions, and thereby affecting blood pressure, functions of the ear, and the nervous system. In comparison, extended periods of noise exposure above 90 dBA would result in permanent cell damage. When the noise level reaches 120 dBA, a tickling sensation occurs in the

human ear, even with short-term exposure. This level of noise is called the threshold of feeling. For avoiding adverse effects on human physical and mental health in the workplace or in communities, the US Department of Labor, Occupational Health and Safety Administration (OSHA) requires the protection of workers from hearing loss when the noise exposure equals or exceeds an 8-hour time-weighted average of 85 dBA.[2]

Unwanted community effects of noise occur at levels much lower than those that cause hearing loss and other health effects. Annoyance occurs when noise interferes with sleeping, conversation, or noise-sensitive work, including learning or listening to the radio, television, or music. According to World Health Organization (WHO) noise studies, during daytime hours, few people are seriously annoyed by activities with noise levels below 55 dBA, or moderately annoyed with noise levels below 50 dBA.[3] Exposure to high noise levels is thought to affect the entire human system. In addition to hearing loss, WHO identified other potential health effects, including hypertension and heart disease, after many years of constant exposure to high noise levels in excess of 75 dBA. Noise can also adversely affect the nervous system, as well as trigger emotional reactions like anger, depression, and anxiety.

c. Groundborne Vibration

Vibrating objects in contact with the ground radiate vibration waves through various soil and rock strata to the foundations of nearby buildings. As the vibration extends from the foundation throughout the remainder of the building, the vibration of floors and walls may be perceptible from the rattling of windows or a rumbling noise. The rumbling sound caused by the vibration of room surfaces is called groundborne noise. When assessing annoyance from groundborne noise, vibration is typically expressed as root mean square (rms) velocity in units of decibels of 1 micro-inch per second. To distinguish vibration levels from noise levels, the unit is written as "VdB."

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[2] OSHA Regulations (Standards – 29 CFR), Occupational Noise Exposure 1910.95.

[3] World Health Organization, 1999. *Guidelines for Community Noise*. Available at: http://www.who.int/docstore/peh/noise/guidelines2.html.

Human perception to vibration starts at levels as low as 67 VdB, and sometimes lower. Annoyance due to vibration in residential settings starts at approximately 70 VdB. Groundborne vibrations are almost never annoying to people who are outdoors. Although the motion of the ground may be perceived, without the effects associated with the shaking of a building, the motion does not provoke the same adverse human reaction.

Common sources of groundborne vibration include trains and construction activities, such as blasting, pile driving, and operating heavy earthmoving equipment. Typical vibration source levels from construction equipment are shown in Table 4.11-3. Although Table 4.11-3 gives one level for each piece of equipment, it should be noted that there is a considerable variation in reported ground vibration levels from construction activities. Factors that influence groundborne vibration include the

- Vibration source: type of activity or equipment, such as impact or mobile, and depth of vibration source;
- Vibration Path: soil type, rock layers, soil layering, depth to water table, and frost depth; and
- Vibration Receiver: foundation type, building construction, and acoustical absorption

In extreme cases, excessive groundborne vibration has the potential to cause structural damage to buildings. The Federal Transit Administration's (FTA) vibration impact criteria and impact assessment guidelines are published in their *Transit Noise and Vibration Impact Assessment* document.[4] The FTA guidelines include thresholds for construction vibration impacts for various structural categories. For buildings considered of particular historical significance or that are particularly fragile structures, the vibration impact criterion is approximately 90 VdB; the vibration impact criterion for non-engineered timber and masonry buildings is approximately 94 VdB. The FTA screening

[4] Federal Transit Administration, 2006. *Transit Noise and Vibration Impact Assessment.*

TABLE 4.11-3 **TYPICAL VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT**

Equipment		Approximate VdB at 25 Feet
Pile Driver (impact)	Upper range	112
	Typical	104
Pile Driver (sonic)	Upper range	105
	Typical	93
Clam Shovel Drop (slurry wall)		94
Hydromill (slurry wall)	In soil	66
	In rock	75
Vibratory Roller		94
Hoe ram		87
Large bulldozer		87
Caisson drilling		87
Loaded trucks		86
Jackhammer		79
Small bulldozer		58

Source: Federal Transit Administration, 2006. *Transit Noise and Vibration Impact Assessment.*

distance for potential groundborne vibration impacts from railroad sources is 200 feet for residential land uses as measured from the rail line's right of way to the receiving property line.

B. Regulatory Framework

This section summarizes existing federal, State, and local laws, policies, and regulations that apply to noise in and around Vacaville.

1. Federal Noise Control Act

In 1972, Congress enacted the Noise Control Act. This act authorized the U.S. Environmental Protection Agency (EPA) to publish descriptive data on the effects of noise and establish levels of sound "requisite to protect the public welfare with an adequate margin of safety." These levels are separated into health (i.e. hearing loss levels) and welfare (i.e. annoyance levels), as shown in Table 4.11-4. EPA cautions that these identified levels are not standards because they do not take into account the cost or feasibility of the levels. These levels provide guidance to local agencies, such as the City of Vacaville, that regulate noise.

For protection against hearing loss, 96 percent of the population would be protected if sound levels are less than or equal to a $L_{eq(24)}$ of 70 dBA. The "(24)" signifies a L_{eq} duration of 24 hours. The EPA activity and interference guidelines are designed to ensure reliable speech communication at about 5 feet in the outdoor environment. For outdoor and indoor environments, interference with activity and annoyance should not occur if levels are below 55 dBA and 45 dBA, respectively.

The noise effects associated with an outdoor L_{dn} of 55 dBA are summarized in Table 4.11-5. At 55 dBA L_{dn}, 95 percent sentence clarity (intelligibility) may be expected at 3.5 meters, and no community reaction. However, 1 percent of the population may complain about noise at this level and 17 percent may indicate annoyance.

2. State Laws and Regulations

a. California Building Code

The State of California has established regulations that help prevent adverse impacts to occupants of buildings located near noise sources. Referred to as the "State Noise Insulation Standards," they require buildings to meet

TABLE 4.11-4 **SUMMARY OF EPA NOISE LEVELS**

Threshold	Level	Area
Hearing loss	Leq(24) < 70 dB	All areas.
Outdoor activity interference and annoyance	Ldn < 55 dB	Outdoors in residential areas, farms, and other outdoor areas where people spend widely varying amounts of time, and other places in which quiet is a basis for use.
	Leq(24) < 55 dB	Outdoor areas where people spend limited amounts of time, such as school yards and playgrounds.
Indoor activity interference and annoyance	Leq < 45 dB	Indoor residential areas.
	Leq(24) < 45 dB	Other indoor areas with human activities such as schools, etc.

Note: These are the threshold levels in order to avoid hearing loss, interference, and annoyance.
Source: U.S. Environmental Protection Agency, 1974. "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety."

TABLE 4.11-5 **SUMMARY OF HUMAN EFFECTS IN AREAS EXPOSED TO 55 DBA LDN**

Type of Effects	Magnitude of Effect
Speech – Indoors	100 percent sentence intelligibility (average) with a 5 dB margin of safety.
Speech – Outdoors	100 percent sentence intelligibility (average) at 0.35 meters. 99 percent sentence intelligibility (average) at 1.0 meters. 95 percent sentence intelligibility (average) at 3.5 meters.
Average Community Reaction	None evident; 7 dB below level of significant complaints and threats of legal action and at least 16 dB below "vigorous action."
Complaints	1 percent dependent on attitude and other non-level related factors.
Annoyance	17 percent dependent on attitude and other non-level related factors.
Attitude Towards Area	Noise essentially the least important of various factors.

Source: U.S. Environmental Protection Agency, 1974. "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety."

performance standards through design and/or building materials that would offset any noise source in the vicinity of the receptor. State construction regulations include requirements that are intended to limit the extent of noise transmitted into habitable spaces of new hotels, motels, apartment houses, and dwellings other than detached single-family homes. These requirements are found in the California Code of Regulations, Title 24, Part 2 (known as the California Building Code), Appendix Chapters 12 and 12A. For limiting noise transmitted between adjacent dwelling units, the noise insulation standards specify the extent to which walls, doors, and floor ceiling assemblies must block or absorb sound. For limiting noise from exterior noise sources, the noise insulation standards set an interior standard of 45 dBA L_{dn} in any habitable room with all doors and windows closed. In addition, the standards require preparation of an acoustical analysis demonstrating the manner in which dwelling units have been designed to meet this interior standard, where such units are proposed in an area with exterior noise levels greater than 60 dBA L_{dn}.

The State has also established land use compatibility guidelines for determining acceptable noise levels for specified land uses. The City has adopted and modified the State's land use compatibility guidelines as discussed below.

3. Local Regulations and Policies

The City of Vacaville provides goals, policies, and regulations related to noise in the General Plan Noise Element and in the noise ordinances of the Municipal Code.

a. Vacaville 1990 General Plan

The City of Vacaville's existing 1990 General Plan contains guiding and implementing policies that are relevant to noise. These guiding and implementing policies occur in the Noise Element and are presented in Table 4.11-6.

The 1990 General Plan also includes land use compatibility standards for noise, measured in dBA and based on L_{dn}. Normally acceptable noise and land use compatibility standards for maximum exterior transportation noise

TABLE 4.11-6 **CITY OF VACAVILLE GENERAL PLAN NOISE POLICIES**

Policy Number	Policy Content
Policy 10.6-G 3	Ensure that noise does not exceed interior noise levels of 45 L_{dn} for residential, transient lodging, hospital and nursing/convalescent structures from transportation or fixed-point noise sources.
Policy 10.6-G 4	Minimize vehicular noise sources and noise emanating from transportation activities; control noise at its source to maintain existing noise levels, and in no case exceed acceptable noise levels as established in the Vacaville General Plan Noise and Land Use Compatibility Guidelines.
Policy 10.6-G 6	Limit truck traffic in residential areas to designated truck routes.
Policy 10.6-G 7	Design subdivisions and plan-lines to minimize the transportation-related noise impacts to adjacent residential areas.
Policy 10.6-G 8	Encourage other agencies to reduce noise levels generated by roadways, railways, airports and other facilities.
Policy 10.6-G 9	Noise created by transportation noise sources shall be mitigated so as not to exceed the interior and exterior noise level standards established in the Vacaville General Plan Noise and Land Use Compatibility Guidelines.
Policy 10.6-G 10	Noise created by non-transportation noise sources shall be mitigated so as not to exceed the interior and exterior noise level standards established in the Vacaville General Plan Noise and Land Use Compatibility Guidelines.
Policy 10.6-G 11	Allow minor exceptions to the noise level design standards in circumstances where impractical mitigation requirements are not consistent with City standards and policies.
Policy 10.6-G 12	New residential land uses shall be precluded where the exterior noise associated with aircraft operations at Nut Tree Airport or Travis Air Force Base exceeds 60 dBA CNEL.
Policy 10.6-I 1	Work to preclude the generation of annoying and/or harmful noise through conditions of approval on stationary noise sources, such as construction and property maintenance activity and mechanical equipment. Support enforcement of the California vehicle noise levels.
Policy 10.6-I 2	Use the Noise and Land Use Compatibility Policies for establishing new land uses.
Policy 10.6-I 3	Require an acoustical analysis for all proposed projects that would locate where the projected transportation noise is greater than the respective 'normally acceptable' noise level. Projects would need to mitigate to the appropriate noise standard.

TABLE 4.11-6 **CITY OF VACAVILLE GENERAL PLAN NOISE POLICIES** (CONTINUED)

Policy Number	Policy Content
Policy 10.6-I 4	Require new developments to pay their fair share for noise attenuation features and mitigation measures to reduce interior noise levels within adjacent or impacted land uses as a condition of approving new projects. This policy applies to both traffic-generated noise sources and fixed-point noise sources.
Policy 10.6-I 5	An acoustical analysis prepared pursuant to this Noise Element shall: ¨ Have the scope of work approved by the Director of Community Development prior to the work being performed. ¨ Be the financial responsibility of the applicant. ¨ Be prepared by a qualified person experienced in the fields of noise assessment and architectural acoustics. ¨ Include representative noise level measurements with sufficient sampling periods and locations to adequately describe local conditions and the predominant noise sources and identify the peak noise sources. ¨ Estimate existing and projected cumulative (horizon period of the General Plan or subsequent up-dates) noise levels in terms of Ldn (for ground transportation or fixed-point sources) or CNEL (for aircraft), and compare those levels to the adopted policies of the Noise Element. ¨ Recommend appropriate mitigation to achieve compliance with the adopted policies and standards of the Noise Element, giving preference to proper site planning and design over the construction of noise barriers or structural modifications to buildings which may be considered to contain noise-sensitive land uses. Where the noise source in question consists of intermittent single events, the report must address the effects of maximum noise levels in sleeping rooms in terms of possible sleep disturbance. ¨ Estimate noise exposure after the prescribed mitigation measures have been implemented. ¨ Estimate the effects of mitigation measures on noise levels at other areas, especially in the use of sound walls. ¨ Describe a post-project monitoring program which could be used to evaluate the effectiveness of the proposed mitigation measures.
Policy 10.6-I 7	Encourage the use of open space, parking, accessory buildings, and landscaping to buffer new and existing development from noise. Use sound walls when other methods are not practical or when recommended by an acoustical expert as part of a mitigation program, consistent with back-up landscape treatments where residential subdivi-

TABLE 4.11-6 **CITY OF VACAVILLE GENERAL PLAN NOISE POLICIES** (CONTINUED)

Policy Number	Policy Content
	sion back-up to roadways.
Policy 10.6-I 9	Require that the effects of sound walls on noise levels in other areas be considered, and taken into account, in the design, location and construction of sound walls.
Policy 10.6-I 16	Enforce, as resources permit, the California State Vehicle Noise Standards for Motor Vehicles.
Policy 10.6-I 18	Limit construction, delivery and through truck traffic to designated routes; maintain smooth street surfaces adjacent to land uses which are sensitive to noise intrusion.
Policy 10.6-I 19	Enforce, as resources permit, the monitoring of approved truck routes by City traffic officers.
Policy 10.6-I 21	Attempt to maintain local and collector streets at 6,000 to 9,000 average daily trips or less to ensure acceptable noise levels within adjacent residences.

Source: Vacaville General Plan, 1990.

levels in sensitive land use areas is 60 dBA L_{dn} or in certain cases 65 dBA L_{dn}. The standard for maximum exterior non-transportation noise levels in sensitive land use areas is 50 dBA L_{eq} and a maximum peak level of 70 dBA.

According to the existing General Plan, new residential developments should be precluded where the exterior noise exceeds 60 dBA CNEL due to aircraft, consistent with the Airport Land Use Plans for Nut Tree Airport and Travis Air Force Base.

b. Vacaville Municipal Code

The Municipal Code includes ordinances addressing community noise standards. Chapter 8.10, Public Nuisance, includes restrictions on the permitted hours of noise-producing construction activities. Chapter 9.16 outlines the City's restrictions on the use of loudspeakers and sound amplifiers within the city limits through required registration and approval processes. Chapter 10.44 outlines the City's reinforcement of the State's Vehicle Code vehicle noise emission levels.

Section 14.09.127.120 of the Land Use and Development Code includes the City's standards and restrictions on noise from both project-related transportation and non-transportation (i.e. stationary) noise sources. All new development must comply with the land use determination standards for ground and air transportation that are provided in Tables 14.09.127.01 and 14.09.127.02 of the Land Use and Development Code.

Stationary noise sources include activities or uses such as industrial operations, outdoor recreation facilities, loading docks, and construction equipment. Two standards apply to stationary noise sources: the hourly L_{eq}, dBA, which is an hourly average sound level, and the maximum level, dBA. Table 14.09.127.04 of the Land Use and Development Code shows the maximum hourly average and the peak daytime and nighttime noise standards for stationary sources when located near sensitive land uses. All uses must comply with these standards, except exempted uses that are outlined in the Land Use and Development Code.

This section of the Land Use and Development Code also restricts sources of groundborne vibration from occurring or being apparent to a reasonable person of normal sensitivity off-site or to an adjacent use on the same site; however, vibration caused by moving vehicles or temporary construction activities is exempted from this provision.

C. Existing Conditions

1. Existing Noise-Sensitive Land Uses

The Specific Plan area site is located in the southeast corner of the City of Vacaville, and is bounded to the west by Leisure Town Road and to the north by Elmira Road. The only noise-sensitive land use in the Specific Plan area vicinity is the medium density residential development located along the west side of Leisure Town Road across from the Specific Plan area site; agricultural land surrounds the Specific Plan area site to the north, east and south.

2. Existing Noise Sources

a. Mobile Noise Sources

i. Traffic

Vehicular traffic is the primary noise source in the Specific Plan area vicinity. The existing traffic noise levels along select roadway segments in the study area are listed in Table 4.11-7. The Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (RD-77-108) was used to evaluate traffic-related noise conditions along segments of Leisure Town Road, Ulatis Drive, Elmira Road, Marshall Road, and Alamo Drive in the Specific Plan area vicinity. The traffic noise model requires various data inputs, including traffic volumes, vehicle mix, vehicle speed, and roadway geometry to compute typical equivalent noise levels during daytime, evening, and nighttime hours. Traffic volumes were obtained from the traffic study prepared for the Specific Plan by Kittelson & Associates, Inc. presented in Section 4.14 with additional material in Appendix K. The resultant noise levels were weighted and summed over 24-hour periods to determine the L_{dn} values. Existing noise levels along these roadway segments (at 50 feet from the centerline of the outermost travel lane) range from 53.4 dBA L_{dn} to 68.5 dBA L_{dn}. The model results for each of the modeled roadway segments are shown in Table 4.11-7. The roadway segments modeled are illustrated in Figure 4.11-1. The traffic noise model printouts are included in Appendix J of this Draft EIR.

a) Railroad*

The Union Pacific rail line is located to the east of the Specific Plan area site. The Specific Plan's proposed detention pond area borders the railroad. The nearest proposed residential buildings would be located approximately 1,700 feet from the centerline of the railroad. The closest at-grade crossing is located approximately 3,350 feet east of the Specific Plan area site at Elmira Road. There is also an at-grade crossing located approximately 3,370 feet south of the Specific Plan area site at Fry Road.

TABLE 4.11-7 **EXISTING TRAFFIC NOISE LEVELS**

Map #	Roadway Segment	ADT[a]	Distance from Roadway Centerline to Indicated Noise Level Contour (Feet)			L_{dn} (dBA) Noise Level at 50 Feet From Centerline of Outermost Travel Lane
			Center-line to 70 L_{dn} Contour (Feet)	Center-line to 65 L_{dn} Contour (Feet)	Center-line to 60 L_{dn} Contour (Feet)	
1	Leisure Town Rd – Orange Dr to Sequoia Dr	17,600	< 50[b]	101	217	68.3
2	Leisure Town Rd – Sequoia Dr to Ulatis Dr	15,000	< 50	91	195	67.6
3	Leisure Town Rd – Ulatis Dr to Elmira Rd	13,100	< 50	84	179	67.0
4	Leisure Town Rd – Elmira Rd to Marshall Rd	14,400	< 50	88	190	68.0
5	Leisure Town Rd – Marshall Rd to Alamo Dr	10,000	< 50	69	149	66.4
6	Leisure Town Rd – Alamo Dr to Vanden Rd	8,700	< 50	63	136	65.8
7	Ulatis Dr – west of Leisure Town Rd	3,200	< 50	< 50	62	58.7
8	Elmira Rd – Z Street (new) to Leisure Town Rd	1,700	< 50	< 50	55	59.9
9	Elmira Rd – Leisure Town Rd to Christine Dr	6,400	< 50	57	113	63.0
10	Elmira Rd – Christine Dr to Nut Tree Rd	10,900	< 50	77	159	65.3
11	Elmira Rd – Nut Tree Rd to Allison Dr	14,100	< 50	90	188	66.4
12	Elmira Rd – Allison Dr to Peabody Rd	22,800	60	122	259	68.5
13	Marshall Rd – Leisure Town Rd to Nut Tree Rd	2,300	< 50	< 50	< 50	53.4
14	Marshall Rd – Nut Tree Rd to Peabody Rd	8,200	< 50	< 50	53	58.9
15	Alamo Dr – Leisure Town Rd to Vanden Rd	5,500	< 50	< 50	101	62.7

[a] Average Daily Traffic.

[b] Traffic noise within 50 feet of the roadway centerline requires site-specific analysis

Source: LSA Associates Inc., January 2012.

Source: LSA Associates Inc.

FIGURE 4.11-1

TRAFFIC NOISE MODELED ROADWAY SEGMENTS

The train activity along the Union Pacific rail line includes Amtrak passenger trains and freight trains. According to Union Pacific, approximately 36 commuter and passenger trains and approximately 34 freight trains operate daily on the tracks.[5] Based on a conservative estimate of 70 daily train passings, the calculated day-night average noise level would be approximately 91 dBA L_{dn} at 50 feet from the nearest at-grade railroad crossings when warning horns are sounded. Warning horns are typically sounded within 1,500 feet of at grade crossings. Due to geometric spreading of the sound over distance, these calculated train noise levels (including warning horns) would attenuate to below 55 dBA L_{dn} at the nearest Specific Plan area property line.

b) Aircraft

The closest airports to the Specific Plan area site are the public Nut Tree Airport and the private Travis Air Force Base airfield. The Nut Tree Airport is located approximately 2.8 miles northwest of the Specific Plan area site; and Travis Air Force Base airfield is located approximately 6.5 miles south of the Specific Plan area site. While aircraft overflight noise is occasionally audible on the Specific Plan area site, due to the distance of the Specific Plan area site from these closest airports and due to the orientation of the runways, the Specific Plan area site lies outside the 60 dBA CNEL contours of both of these airports.

ii. Stationary Noise Sources

Stationary noise sources in the Specific Plan area vicinity include agricultural equipment operations on surrounding agricultural land uses. These noise sources are seasonal in nature and would only make noise for brief periods of time as equipment operates near the Specific Plan area's property adjoining lines. Other stationary noise sources in the Specific Plan area vicinity include the commercial land uses to the northwest of the Leisure Town Road and Elmira Road intersection. However, the closest of these commercial use areas is located over 250 feet from the nearest Specific Plan area property line, and therefore, are not a significant noise source for the ambient noise environ-

[5] City of Vacaville, 2005. *Southtown Project Draft EIR*.

ment on the Specific Plan area site. As noted previously, the dominant noise source audible on the Specific Plan area site is traffic on roadways adjacent to the Specific Plan area site.

iii. Groundborne Vibration Sources

There are no existing groundborne vibration sources that significantly contribute to the ambient environment in the Specific Plan area vicinity. The closest existing source of groundborne vibration would be the Union Pacific rail line, located approximately 1,700 feet from the nearest portion of residential development that would occur under buildout of the Specific Plan. Due to the distance attenuation, groundborne vibration from the source is not perceptible on the Specific Plan area site.

b. Existing Ambient Noise Measurements

LSA conducted ambient noise surveys in Vacaville on June 2, 2010. A Larson-Davis Model 720 sound level meter was used to conduct the ambient noise survey. This noise monitoring effort included a short-term, 15-minute, ambient noise level measurement taken in the park area next to 719 Atchison Drive, approximately 85 feet from the western edge of Leisure Town Road. This site is located just north of the Elmira Road and Leisure Town Road intersection. The ambient noise level at this location was documented as averaging 65 dBA L_{eq} at approximately 8:00 in the morning. The primary noise source during this noise measurement was traffic on Leisure Town Road.

D. Standards of Significance

The proposed Specific Plan would have a significant impact with regard to noise if it would:

1. Expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
2. Expose persons to or generate excessive groundborne vibration or groundborne noise levels.

3. Substantially, permanently increase ambient noise levels in the project vicinity above levels existing without the project.
4. Substantially, temporarily or periodically increase ambient noise levels in the project vicinity above levels existing without the project.
5. Expose people residing or working in the project area to excessive noise levels from aircraft noise sources.

E. Impact Discussion

This section describes potential impacts which could occur as a result of buildout of the Specific Plan, identifies what impacts would actually occur, and what measures would be required to reduce any impacts to a less-than-significant level.

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

This standard of significance addresses potential noise impacts to new sensitive receptors within the Specific Plan process. The City's established noise standards can only be applied to new development, not to existing development. Impacts to existing neighborhoods are covered under Section E.3, below.

a. Traffic Noise Impacts

The FHWA highway traffic noise prediction model (FHWA RD-77-108) was used to evaluate traffic-related noise conditions in the vicinity of the Specific Plan area. The resultant noise levels were weighed and summed over a 24-hour period in order to determine the L_{dn} values. The existing, near-term traffic volumes for roadway segments in the Specific Plan area vicinity were used in the traffic noise impact analysis. Table 4.11-8 summarizes traffic noise levels along modeled roadway segments under Existing and Existing + Project traffic conditions. These scenarios present the near-term noise environment compared to 2011 levels if the Specific Plan were built out. The traffic noise model printouts for all calculations, including those for the modeled

TABLE 4.11-8 **TRAFFIC NOISE LEVELS (dBA, Ldn)**

Map #	Roadway Segment	Existing[a]	Existing + Project [b]	Increase from Existing (dBA)
1	Leisure Town Rd – Orange Dr to Sequoia Dr	66.5	66.4	-0.1
2	Leisure Town Rd – Sequoia Dr to Ulatis Dr	65.8	65.9	0.1
3	Leisure Town Rd – Ulatis Dr to Elmira Rd	65.2	65.4	0.2
4	Leisure Town Rd – Elmira Rd to Marshall Rd	65.3	65.8	0.5
5	Leisure Town Rd – Marshall Rd to Alamo Dr	63.7	64.4	0.7
6	Leisure Town Rd – Alamo Dr to Vanden Rd	63.1	63.4	0.3
7	Ulatis Dr – west of Leisure Town Rd	58.7	58.8	0.1
8	Elmira Rd – Z Street (new) to Leisure Town Rd	57.2	64.5	7.3
9	Elmira Rd – Leisure Town Rd to Christine Dr	63.0	65.4	2.4
10	Elmira Rd – Christine Dr to Nut Tree Rd	65.3	66.6	1.3
11	Elmira Rd – Nut Tree Rd to Allison Dr	66.4	66.9	0.5
12	Elmira Rd – Allison Dr to Peabody Rd	68.5	68.6	0.1
13	Marshall Rd – Leisure Town Rd to Nut Tree Rd	53.4	54.5	1.1
14	Marshall Rd – Nut Tree Rd to Peabody Rd	58.9	58.9	0.0
15	Alamo Dr – Leisure Town Rd to Vanden Rd	62.7	64.3	1.6

[a] As measured at the equivalent distances to 50 feet from the centerline of the outermost travel lane of the ultimate roadway alignments in order to provide comparable noise level comparisons to cumulative modeled scenarios.

[b] As measured at 50 feet from the centerline of the outermost travel lane assuming the ultimate roadway alignments as shown in the Brighton Landing Specific Plan.

Source: LSA Associates Inc., January 2012.

sound-barrier runs, are included in Appendix J of this Draft EIR. Traffic noise levels along modeled roadway segments would range from 54.5 dBA L_{dn} to 66.9 dBA L_{dn} under Existing + Project conditions as measured at 50 feet from the centerline of the outermost travel lane.

A significant impact would occur for proposed on-site noise sensitive land uses if the traffic noise levels with buildout of the Specific Plan would exceed the City's normally acceptable standard of 60 dBA L_{dn} for transportation noise source impacts on new residential development. According to the modeling results, traffic noise levels along the segment of Leisure Town Road that is adjacent to the Specific Plan area (the modeled segment from Elmira Road to Marshall Road) would range up to 65.8 dBA L_{dn} under Existing + Project conditions as measured at the proposed residential property line. These noise levels were modeled assuming the present roadway alignments conditions. Traffic noise impacts under conditions with the widening of Elmira Road and Leisure Town Road (Jepson Parkway) are discussed under the cumulative impacts section below.

Traffic noise levels along the segment of Elmira Road that is adjacent to the Specific Plan area (the modeled segment from the project entrance at the proposed new Z Street to Leisure Town Road) would range up to 64.5 dBA L_{dn} under Existing + Project conditions at 50 feet from the centerline of the outermost travel lane. While these traffic noise levels are considered "normally acceptable" for new commercial and school land uses, these noise levels are in excess of the City's "normally acceptable" standard of 60 dBA L_{dn} for transportation noise source impacts on new residential development. Therefore, mitigation would be required to reduce these traffic noise levels to meet the City's noise level standards.

To reduce the projected exterior noise level at proposed outdoor active use areas, both a 6-foot and 8-foot-high sound barrier wall or sound wall/berm combination were modeled along the residential property lines of the Specific Plan area site that adjoin Leisure Town Road and Elmira Road. The sound walls were modeled assuming the roadway, base of the sound wall, and recep-

tor locations were of the same elevation in order to consider the most conservative scenario.

If the existing residential properties located in the northwest of the Specific Plan area remain after buildout of the Specific Plan, these mitigating sound barrier walls would be required along the edges of these property lines adjoining Leisure Town Road and Elmira Road, with wrap-around portions extending along any necessary access driveways to these properties, so that line of sight from outdoor active use areas of these properties to the roadways is blocked.

The modeling results show that an 8-foot-high sound wall or sound wall/berm combination would reduce traffic noise levels along Leisure Town Road at all of the closest proposed outdoor active use areas to below 60 dBA L_{dn}. Implementation of a minimum 6-foot-high sound wall or sound wall/berm combination would reduce traffic noise levels along Elmira Road to below 60 dBA L_{dn} at the closest proposed outdoor active use areas of the project site bordering this roadway. This resulting noise level would also ensure that the City's interior noise level standard of 45 dBA L_{dn} is met for the proposed residential units.[6] However, without the sound walls (or sound wall/berm combination), there would be a *significant* impact.

Impact NOISE-1: Future projected traffic noise levels along roadway segments adjacent to the Specific Plan area site would exceed the City's normally acceptable standard of 60 dBA L_{dn} for transportation noise source impacts on new residential development, as well as exceed the City's 45 dBA L_{dn} residential interior noise level standard.

[6] Based on the EPA's Protective Noise Levels (EPA 550/9-79-100, November 1978), with a combination of walls, doors, and windows, standard construction for northern California residential buildings would provide more than 25 dBA in exterior to interior noise reduction with windows closed and 15 dBA or more with windows open.

Mitigation Measure NOISE-1: A minimum 8-foot-high sound barrier wall or wall/berm shall be constructed along the property lines of the proposed residential properties that adjoin Leisure Town Road and a minimum 6-foot-high sound barrier wall or wall/berm shall be constructed along the property lines of the proposed residential properties that adjoin Elmira Road. The sound walls should be located along the residential property line of all residences that adjoin Leisure Town Road or Elmira Road. The sound barrier height shall be determined as measured from either the adjoining edge of roadway elevation or the receiving property elevation, whichever is higher. If the existing residential properties located in the northwest corner of the Specific Plan area remain after buildout of the Specific Plan, these mitigating sound barrier walls shall also be required along the edges of these property lines adjoining Leisure Town Road and Elmira Road, with wrap-around portions extending along any necessary access driveways to these properties, so that line of sight from outdoor active use areas of these properties to the roadways is blocked.

Significance After Mitigation: Modeling results have shown that the sound barrier walls or wall/berm combinations constructed at the above indicated heights would lower the exterior noise level to below the City's 60 dBA L_{dn} standard for transportation noise source impacts on new residential development, and thus also meet the City's 45 dBA L_{dn} residential interior noise level standard, and the impact would be *less than significant.*

b. Stationary Sources Noise Impacts

As noted in the Existing Conditions discussion above, existing stationary noise sources in the Specific Plan area vicinity do not contribute significantly to the ambient noise environment on the Specific Plan area site, and the dominant existing noise source audible on the Specific Plan area site is traffic on roadways adjacent to the Specific Plan area site. Therefore, buildout of the Specific Plan would not result in the exposure of new sensitive receptors to excessive noise levels from existing stationary noise sources. However,

buildout of the Specific Plan would introduce new stationary noise sources to the existing environment.

Proposed residential, school, and commercial uses would contain new stationary noise sources such as mechanical equipment (HVAC systems, compressors, or fans), delivery loading/unloading activities, parking lot activities, and student and spectator talking and shouting in playground and outdoor sport facilities areas. Under the Specific Plan, these new uses would be located over 175 feet from the closest existing off-site noise sensitive receptors. At this distance, noise levels from periodic use of new stationary equipment associated with buildout of the Specific Plan would not result in a perceptible increase in ambient noise levels, nor would future noise levels exceed the existing ambient noise levels at nearby sensitive land uses. Therefore, noise levels from new stationary noise sources associated with buildout of the Specific Plan would result in a *less-than-significant* impact on nearby residences outside of the Specific Plan area.

However, these new stationary noise sources could result in impacts on sensitive land uses within the Specific Plan area. Stationary noise sources associated with the new development must demonstrate compliance with the City's Noise Element policies and municipal code requirements for non-transportation noise sources. The City's non-transportation noise standards are provided in the Noise Element of the General Plan and are summarized as follows:

- Non-transportation noise sources shall not generate hourly average noise levels in excess of 50 dBA $L_{eq}(h)$ during daytime hours or in excess of 45 dBA $L_{eq}(h)$ during nighttime hours as measured at receiving outdoor active use areas of residential land uses; and
- Non-transportation noise sources shall not generate maximum noise levels in excess of 70 dBA L_{max} during daytime hours or in excess of 65 dBA L_{max} during nighttime hours as measured at receiving outdoor active use areas of residential land uses.

Each of these new stationary noise sources associated with buildout of the Specific Plan could result in a *significant* impact on proposed noise sensitive land uses.

Impact NOISE-2: New stationary noise sources associated with buildout of the Specific Plan could exceed the City's noise standards for stationary (non-transportation) noise sources as measured at proposed residential outdoor active use areas.

Mitigation Measure NOISE-2a: Prior to the issuance of building permits, the project applicant shall submit documentation to the City planning department demonstrating how proposed mechanical equipment will comply with the applicable standards. This can take the form of installation of quieter rated equipment (such as HVAC units with a noise bel (B) rating of 7.6 B or lower), or through strategic placement of units, or the use of sound-attenuating shielding or sound walls.

Mitigation Measure NOISE-2b: In addition, the project applicant shall submit documentation to the City planning department demonstrating how noise from any commercial delivery loading/unloading activities and how noise from proposed school uses, such as student and spectator talking and shouting in playground and outdoor sport facilities areas, will be mitigated to comply with the City's non-transportation noise standards. This mitigation can take the form of strategic placement of these uses (locating them as far as feasible from sensitive receptors), or through the use of sound walls to provide shielding for receiving outdoor active use areas of residential land uses. Commercial and school delivery loading/unloading activities shall be restricted to the hours of 6:00 a.m. to 10:00 p.m. in order to reduce sleep disturbance to adjacent on-site residential receptors.

Significance After Mitigation: Through implementation of noise attenuating design features, impacts from stationary noise sources associated

with buildout of the Specific Plan would be reduced to *less than significant*.

2. Expose persons to or generate excessive groundborne vibration or groundborne noise levels.

No permanent noise sources that would expose persons to excessive ground borne vibration or noise levels are proposed as part of the Specific Plan. There are no existing permanent sources of groundborne vibration or noise in the Specific Plan area vicinity that could impact proposed sensitive land uses. As noted in the regulatory discussion, the FTA screening distance for potential groundborne vibration impacts from railroad sources is 200 feet for residential land uses as measured from the rail line's right of way to the receiving property line. The nearest such source is Union Pacific rail line located approximately 1,700 feet east of the nearest proposed residential buildings of the Specific Plan site. Therefore, buildout of the Specific Plan would have a *less-than-significant* impact in the exposure of persons within or around the Specific Plan area site to excessive ground borne vibration.

3. Substantially, permanently increase ambient noise levels in the Specific Plan area vicinity above levels existing without buildout of the Specific Plan.

A significant impact on existing nearby residences outside of the Specific Plan area would occur if traffic noise levels with buildout of the Specific Plan would result in a substantial permanent increase in ambient noise levels above those that would exist without buildout of the Specific Plan. As stated in the noise concepts discussion of this section, "audible increases" in noise levels generally refer to a change of 3 dBA or more, as this level has been found to be barely perceptible to the human ear in outdoor environments. Therefore, for purposes of this analysis, increases of more than 3 dBA in ambient noise levels above levels existing without buildout of the Specific Plan are considered a significant impact.

Based on the traffic noise modeling results, only one modeled roadway segment would experience increases in traffic noise levels with buildout of the

Specific Plan of greater than 3 dBA above those that would be experienced without buildout of the Specific Plan. The roadway segment of Elmira Road that is adjacent to the Specific Plan area site would experience an increase of 7.3 dBA under Existing + Project conditions, compared to conditions that would exist without buildout of the Specific Plan. However, the closest existing residence along this roadway segment is approximately 350 feet north of Elmira Road on Meridian Road. At this distance, project related traffic noise levels would attenuate to levels below background ambient noise levels and would therefore not result in a perceptible increase in ambient noise levels at this existing home. Similarly, the closest existing on-site sensitive land use to this roadway segment (the residential property in the northwest corner of the Specific Plan area) is located over 380 feet from the centerline of Elmira Road. At this distance, the project-related increase in traffic noise levels would not be perceptible above background ambient noise level conditions.

The increase in traffic noise levels that would occur with buildout of the Specific Plan, would not result in a substantial permanent increase in ambient noise levels compared to noise levels existing without the project for any on-site or any off-site residences. Residents of existing homes on the west side of Leisure Town Road would not perceive an increase in noise levels attributable to the Specific Plan project, nor would residents to the north or south of the project site. Therefore, impacts from a permanent increase in ambient noise levels would be considered *less than significant*.

4. Substantially, temporarily or periodically increase ambient noise levels in the Specific Plan area vicinity above levels existing without buildout of the Specific Plan.

Construction related short-term noise levels would be higher than existing ambient noise levels in the Specific Plan area vicinity but would no longer occur once construction is completed.

Two types of short-term noise impacts could occur during construction within the Specific Plan area vicinity. First, construction crew commutes and the transport of construction equipment and materials to construction sites with-

in the Specific Plan area would incrementally increase noise levels on access roads leading to the sites. Although there would be relatively high single noise events with passing heavy trucks (passing trucks at 50 feet would generate up to a maximum of 86 dBA Lmax), the effect on longer term (hourly or daily) ambient noise levels would be small. In general, a doubling of a sound source is required in order to result in a perceptible, defined as 3 dBA or greater, increase in ambient noise levels. Project construction trips would not double the number of daily trips along the access roadways to the Specific Plan site. Therefore, short-term construction related impacts associated with worker commute and equipment transport to construction sites within the Specific Plan area would be *less than significant*.

The second type of short-term noise impact is related to noise generated during excavation, grading, and erection of buildings on sites within the Specific Plan area. Construction is completed in discrete steps, each of which has its own mix of equipment and, consequently, its own noise characteristics. These various sequential phases would change the character of the noise generated and, therefore, the noise levels surrounding the site as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction related noise ranges to be categorized by work phase. Table 4.11-9 lists typical construction equipment noise levels recommended for noise impact assessments, based on a distance of 50 feet between the equipment and a noise receptor. The site preparation phase, which includes excavation and grading of the site, tends to generate the highest noise levels, because the noisiest construction equipment is earthmoving equipment. Earthmoving equipment includes excavating machinery such as backhoes, bulldozers, draglines, and front loaders. Earthmoving and compacting equipment includes compactors, scrapers, and graders. Typical operating cycles for these types of construction equipment may involve one or two minutes of full-power operation followed by 3 or 4 minutes at lower power settings.

Construction associated with buildout under the Specific Plan is expected to require the use of earthmovers such as bulldozers and scrapers, loaders and

TABLE 4.11-9 **TYPICAL CONSTRUCTION EQUIPMENT MAXIMUM NOISE LEVELS**

Type of Equipment	Range of Maximum Sound Levels (dBA at 50 Feet)	Suggested Maximum Sound Levels for Analysis (dBA at 50 Feet)
Pile Drivers	81 to 96	93
Rock Drills	83 to 99	96
Jackhammers	75 to 85	82
Pneumatic Tools	78 to 88	85
Pumps	68 to 80	77
Scrapers	83 to 91	87
Haul Trucks	83 to 94	88
Electric Saws	66 to 72	70
Portable Generators	71 to 87	80
Rollers	75 to 82	80
Dozers	85 to 90	88
Tractors	77 to 82	80
Front-End Loaders	86 to 90	88
Hydraulic Backhoe	81 to 90	86
Hydraulic Excavators	81 to 90	86
Graders	79 to 89	85
Air Compressors	76 to 89	85
Trucks	81 to 87	85

Source: Bolt, Beranek & Newman, 1987. Noise Control for Buildings and Manufacturing Plants.

graders, water trucks and other trucks. It may also include the use of pile drivers. As shown in Table 4.11-9, the typical maximum noise level generated by backhoes is assumed to be 86 dBA L_{max} at 50 feet from the operating equipment. The maximum noise level generated by bulldozers is approximately 88 dBA L_{max} at 50 feet. The maximum noise level generated by water and other trucks is approximately 85 dBA L_{max} at 50 feet from these vehicles. Each doubling of the sound sources with equal strength would increase the noise level by 3 dBA. Assuming each piece of construction equipment operates at some distance apart from the other equipment, the worst-case combined noise level during this phase of construction would be 91 dBA L_{max} at a distance of 50 feet from an active construction area. If the use of impact pile driving is required for foundations construction, potential construction noise levels could range up to 93 dBA L_{max} at a distance of 50 feet from operating pile driving equipment.

The closest off-site noise sensitive receptors would be the residential land uses located along the west side of Leisure Town Road, approximately 175 feet from the nearest Specific Plan area property line. At this distance, these residences would potentially be exposed to construction noise levels of up to 81 dBA L_{max} when heavy construction equipment operates along the Specific Plan area's western boundary adjacent to Leisure Town Road. The closest on-site sensitive receptors would be the two existing residential properties in the northwest corner of the Specific Plan area, or future residential units that could be occupied during buildout of the Specific Plan. These on-site sensitive receptors could experience noise levels of up to approximately 91 dBA L_{max} if heavy construction equipment operated simultaneously near their property lines, or up to 93 dBA L_{max} if pile driving equipment operated near their property lines.

The operation of heavy earthmoving equipment related to construction of the proposed Specific Plan area would result in a substantial temporary or periodic increase in ambient noise levels in the Specific Plan area vicinity above levels existing without buildout of the Specific Plan. Therefore, the impact would be *significant* and implementation of the following multi-part mitiga-

tion measure would be required to minimize exposure of sensitive receptors to substantial noise levels from construction activities.

Impact NOISE-3: Construction period activities could result in temporary significant increases in the existing ambient noise levels at sensitive land uses in the Specific Plan area vicinity above noise levels existing without buildout of the Specific Plan.

Mitigation Measure NOISE-3: In accordance with City standards, the construction contractor shall ensure the following:

- All internal combustion engine-driven construction equipment operated on the site are fitted with intake and exhaust mufflers that are in good condition and appropriate for the equipment and are used at all times such equipment is in operation.
- All stationary construction equipment is placed so that emitted noise is directed away from sensitive receptors nearest the site.
- To the maximum extent practical, locate on-site equipment staging areas so as to maximize the distance between construction-related noise sources and noise-sensitive receptors nearest the site during all construction.
- All noise-producing general construction related activities (including, but not limited to, the operation of construction or grading equipment) are restricted to the hours between dusk (one-half hour after sunset) and 7:00 a.m. Monday through Saturday. No construction or grading activities shall be allowed on Sundays or holidays except as provided in Section 8.10.030 of the Municipal Code.

Significance After Mitigation: With these restrictions, construction noise would be reduced to levels in line with the City Code and the impact both within the Specific Plan area and at nearby residences outside of the Specific Plan area would be *less than significant.*

5. Expose people residing or working in the Specific Plan area to excessive noise levels from aircraft noise sources.

Aircraft noise would be audible at noise-sensitive land uses on the Specific Plan area site. However, the closest airports to the Specific Plan area site are the public Nut Tree Airport and the private Travis Air Force Base airfield. The Nut Tree Airport is located approximately 2.8 miles northwest of the Specific Plan area site; and Travis Air Force Base airfield is located approximately 6.5 miles south of the Specific Plan area site. While aircraft overflight noise is occasionally audible on the Specific Plan area site, due to the distance of the Specific Plan area site from these closest airports and due to the orientation of the runways, the Specific Plan area site lies outside the 60 dBA CNEL contours of both of these airports. Therefore, buildout of the Specific Plan would not expose people working or residing in the Specific Plan area vicinity to excessive aircraft-related noise levels. Therefore, this impact would be *less than significant.*

F. Cumulative Impacts

1. With Existing + Approved Projects Conditions in Near Term (With and Without Specific Plan)

Potential noise impacts on new development within the Specific Plan Area resulting from noise that exceeds City standards are considered in section F.1.a, below. Potential noise impacts on existing neighborhoods that would occur as a result of the development of the proposed Specific Plan are considered under Section F.1.b.

a. Exceedence of City Noise Standards

As discussed above, buildout of the Specific Plan would generate project-related noise levels that would exceed the City's normally acceptable standards for new residential development. The cumulative impacts from exceedance of City Noise Standards are discussed in the following paragraphs.

Table 4.11-10 summarizes traffic noise levels along modeled roadway segments under Existing + Approved Projects, and Existing + Approved Projects + Brighton Landing Specific Plan Project traffic conditions. These

TABLE 4.11-10 **TRAFFIC NOISE LEVELS (dBA, Ldn)**

Map #	Roadway Segment	Existing[a]	Existing + Approved[b]	Existing + Approved + Project[b]	Increase from Existing + Approved (dBA)
1	Leisure Town Rd – Orange Dr to Sequoia Dr	66.5	67.7	67.7	0.0
2	Leisure Town Rd – Sequoia Dr to Ulatis Dr	65.8	67.0	67.1	0.1
3	Leisure Town Rd – Ulatis Dr to Elmira Rd	65.2	66.4	66.6	0.2
4	Leisure Town Rd – Elmira Rd to Marshall Rd	65.3	67.0	67.4	0.4
5	Leisure Town Rd – Marshall Rd to Alamo Dr	63.7	66.0	66.6	0.6
6	Leisure Town Rd – Alamo Dr to Vanden Rd	63.1	66.1	66.3	0.2
7	Ulatis Dr – west of Leisure Town Rd	58.7	59.1	59.2	0.1
8	Elmira Rd – Z Street (new) to Leisure Town Rd	57.2	58.9	65.8	6.9
9	Elmira Rd – Leisure Town Rd to Christine Dr	63.0	64.4	66.0	1.6
10	Elmira Rd – Christine Dr to Nut Tree Rd	65.3	65.9	67.0	1.1
11	Elmira Rd – Nut Tree Rd to Allison Dr	66.4	66.6	67.0	0.4
12	Elmira Rd – Allison Dr to Peabody Rd	68.5	68.6	68.8	0.2
13	Marshall Rd – Leisure Town Rd to Nut Tree Rd	53.4	53.9	54.8	0.9
14	Marshall Rd – Nut Tree Rd to Peabody Rd	58.9	59.0	59.0	0.0
15	Alamo Dr – Leisure Town Rd to Vanden Rd	62.7	64.0	64.7	0.7

[a] As measured at the equivalent distances to 50 feet from the centerline of the outermost travel lane of the ultimate roadway alignments in order to provide comparable noise level comparisons to cumulative modeled scenarios.

[b] As measured at 50 feet from the centerline of the outermost travel lane assuming the ultimate roadway alignments as shown in the Brighton Landing Specific Plan.

Source: LSA Associates Inc., January 2012.

scenarios present the near-term noise environment compared to 2011 levels if the Specific Plan were built out, and then if the Specific Plan, together with all known projects that are currently underway, were completed. The traffic noise model printouts for all calculations, including those for the modeled sound-barrier runs, are included in Appendix J of this Draft EIR. Traffic noise levels along Leisure Town Road adjacent to the Specific Plan area would range up to 67.4 dBA L_{dn}, while traffic noise levels along Elmira Road adjacent to the Specific Plan area would range up to 65.8 dBA L_{dn} under Existing + Approved Projects + Brighton Landing Specific Plan Project traffic conditions, as measured at 50 feet from the centerline of the outermost travel lane of the ultimate roadway alignments.

The ultimate alignment of Leisure Town Road (with the approved Jepson Parkway widening project) and the widening of Elmira Road would move the centerline of these roadways closer to the proposed Specific Plan site. Therefore, traffic noise impacts are analyzed in the following discussion assuming that the Jepson Parkway Project alongside the Specific Plan area is completed before the Specific Plan, as that represents a worst-case scenario for traffic noise.

Based on Figure 3-8 of this Draft EIR, the nearest outdoor active use areas of the proposed Specific Plan area to the ultimate alignment and widening of Leisure Town Road, which would become Jepson Parkway, would be located a minimum of 74 feet from the centerline of the outermost travel lane (or 100 feet from the roadway centerline). At this distance, the highest predicted traffic noise levels that would be experienced under Existing + Approved + Brighton Landing Specific Plan Project traffic conditions would be reduced to approximately 65 dBA L_{dn} due to geometric spreading and distance attenuation.

Similarly, based on Figure 3-4 of this Draft EIR, the private school site and residential back yards, which are the nearest outdoor active use areas within the proposed Specific Plan, would be located approximately 50 feet from the centerline of the outermost travel lane of Elmira Road's ultimate alignment.

As shown in Table 4.11-10, traffic noise levels at this distance would range up to approximately 66 dBA L_{dn} under Existing + Approved + Brighton Landing Specific Plan Project traffic conditions.

The property at the southeast corner of Elmira Road and Leisure Town Road (Jepson Parkway) would be subjected to noise from both adjacent roadways. The closest sensitive receptors would be located 100 feet from the centerline of Leisure Town Road and 69 feet of the centerline of Elmira Road. Combined traffic noise levels at this location would range up to 70 dBA L_{dn} under Existing + Approved + Brighton Landing Specific Plan Project traffic conditions. This combined noise level assumes that no shielding is provided between the traffic and the modeled sensitive receptor locations.

While these traffic noise levels are considered "normally acceptable" for new commercial and school land uses, these noise levels are in excess of the City's "normally acceptable" standard of 60 dBA L_{dn} for traffic noise impacts on new residential development. Therefore, to meet the City's noise level standards, mitigation would be required to reduce the traffic noise levels that would be experienced by residents of new development within the Specific Plan area.

Impact-NOISE-CUM-1: Future projected traffic noise levels along roadway segments adjacent to the Specific Plan area site for Existing + Approved Projects + Brighton Landing Specific Plan Project would exceed the City's normally acceptable standard of 60 dBA L_{dn} for transportation noise source impacts on new residential development, as well as exceed the City's 45 dBA L_{dn} residential interior noise level standard.

Mitigation Measure NOISE-CUM-1: See Mitigation Measure NOISE-1.

Significance After Mitigation: Based on the sound wall modeling results, construction of a minimum 8-foot-high sound barrier wall or wall/berm along Leisure Town Road, and a 6-foot-high barrier wall or wall/berm along Elmira Road, as described in Mitigation Measure NOISE-1, would reduce the traffic noise levels from Existing Conditions + Approved Pro-

jects + Brighton Landing Specific Plan at on-site residential outdoor active use areas to a *less-than-significant* level.

b. Substantial Permanent Noise Increase

A significant impact on existing residences in the Specific Plan area vicinity would occur if traffic noise levels under Existing + Approved + Brighton Landing Specific Plan Project conditions would result in a substantial permanent increase in ambient noise levels above those that would exist without buildout of the Specific Plan.

Based on the traffic noise modeling results for Existing + Approved + Brighton Landing Specific Plan Project conditions (shown in Table 4.11-10), the modeled segments of Leisure Town Road would not experience increases in traffic noise levels with buildout of the Specific Plan of greater than 3 dBA above those that would be experienced without buildout of the Specific Plan, and therefore residents west of Leisure Town Road would not be expected to perceive an increase in noise levels above what would exist in the future without the proposed project.

Only one modeled roadway segment would experience increases in traffic noise levels with buildout of the Specific Plan of greater than 3 dBA above those that would be experienced without buildout of the Specific Plan. The roadway segment of Elmira Road that is adjacent to the Specific Plan area site, from the proposed new Z Street to Leisure Town Road, would experience an increase of 6.9 dBA under Existing + Approved + Brighton Landing Specific Plan Project conditions, compared to conditions that would exist without buildout of the Specific Plan. As described in the project-level noise impact discussion, traffic noise levels would gradually be reduced over the distance from the roadway to existing residences north or south of Elmira Road. Therefore, this increase in traffic noise levels would not be perceptible above background ambient noise level conditions at sensitive receptors along this roadway segment. As a result, the increase in traffic noise levels that would occur with buildout of the Specific Plan would not result in a substantial permanent increase in ambient noise levels compared to noise levels existing

without the project for any on-site or off-site noise sensitive receptors, including existing neighborhoods west of Leisure Town Road, and would therefore have a *less-than-significant* cumulative impact.

2. Under Existing 1990 General Plan Conditions in 2035

a. Exceedence of City Noise Standards

This section describes potential impacts which could occur as a result of buildout of the Specific Plan under cumulative conditions with development associated with the 1990 General Plan in 2035, and identifies what impacts would actually occur and what measures would be required to reduce any impacts to a less-than-significant level. Traffic noise level results under Cumulative traffic conditions for 2035 (without and with the Specific Plan buildout) are summarized in Table 4.11-11.

Cumulative noise impacts associated with buildout of the proposed Specific Plan would primarily result from traffic noise sources. As shown in the traffic noise modeling results summarized in Table 4.11-11, buildout associated with the proposed Specific Plan would result in traffic noise levels along modeled roadway segments ranging from 55.3 dBA to 69.8 dBA L_{dn} at 50 feet from the centerline of the outermost travel lane under cumulative (year 2035) conditions.

Based on the proposed site plans, the nearest outdoor active use areas to the ultimate alignment (including the proposed widening of Jepson Parkway) of Leisure Town Road would be located a minimum of 74 feet from the centerline of the outermost travel lane (or 100 feet from the roadway centerline). At this distance, the highest predicted traffic noise levels that would be experienced with buildout of the Specific Plan (Cumulative + Project traffic conditions) would be reduced to approximately 67 dBA L_{dn} due to geometric spreading and distance attenuation. The nearest outdoor active use areas of the proposed project to the ultimate alignment of Elmira Road would be located approximately 50 feet from the centerline of the outermost travel lane, which is the distance modeled in the traffic noise model, thus traffic noise levels at the nearest outdoor active use areas on the project site adjoining

TABLE 4.11-11 **CUMULATIVE TRAFFIC NOISE LEVELS (dBA, L_{DN})**

Roadway Segment	Existing[a]	Cumulative[b]	Cumulative + Project[b]	Increase from Existing[b]	Increase from Cumulative
Leisure Town Rd – Orange Dr to Sequoia Dr	66.5	69.7	69.8	3.3	0.1
Leisure Town Rd – Sequoia Dr to Ulatis Dr	65.8	69.2	69.3	3.5	0.1
Leisure Town Rd – Ulatis Dr to Elmira Rd	65.2	68.9	69.0	3.8	0.1
Leisure Town Rd – Elmira Rd to Marshall Rd	65.3	69.1	69.2	3.9	0.1
Leisure Town Rd – Marshall Rd to Alamo Dr	63.7	68.5	68.7	5.0	0.2
Leisure Town Rd – Alamo Dr to Vanden Rd	63.1	67.8	68.0	4.9	0.2
Ulatis Dr – west of Leisure Town Rd	58.7	61.1	61.3	2.6	0.2
Elmira Rd – Z Street (new) to Leisure Town Rd	57.2	63.2	66.9	9.7	3.7
Elmira Rd – Leisure Town Rd to Christine Dr	63.0	66.5	67.2	4.2	0.7
Elmira Rd – Christine Dr to Nut Tree Rd	65.3	67.2	67.7	2.4	0.5
Elmira Rd – Nut Tree Rd to Allison Dr	66.4	67.4	67.7	1.3	0.3
Elmira Rd – Allison Dr to Peabody Rd	68.5	69.1	69.2	0.7	0.1
Marshall Rd – Leisure Town Rd to Nut Tree Rd	53.4	55.3	55.5	2.1	0.2
Marshall Rd – Nut Tree Rd to Peabody Rd	58.9	59.0	59.0	0.1	0.0
Alamo Dr – Leisure Town Rd to Vanden Rd	62.7	66.4	66.7	4.0	0.3

[a] As measured at the equivalent distances to 50 feet from the centerline of the outermost travel lane of the ultimate roadway alignments in order to provide comparable noise level comparisons to cumulative modeled scenarios.
[b] As measured at 50 feet from the centerline of the outermost travel lane assuming the ultimate roadway alignments as shown in the Brighton Landing Specific Plan.
Source: LSA Associates Inc., January 2012.

Elmira Road would range up to approximately 67 dBA L_{dn}. Combined traffic noise levels at 100 feet of the centerline of Leisure Town Road and 76 feet of the centerline of Elmira Road would range up to 70 dBA L_{dn}. This combined noise level assumes that no shielding is provided between the traffic and the modeled sensitive receptor locations. These noise levels are in excess of the City's normally acceptable standard of 60 dBA L_{dn} for transportation noise sources, and would similarly exceed the City's residential interior noise level standard of 45 dBA L_{dn} for new residential land use development. Therefore mitigation would be required.

Impact-NOISE-CUM-2: Future projected traffic noise levels along roadway segments adjacent to the Specific Plan area site under 1990 General Plan Conditions in 2035 + Brighton Landing Specific Plan, would exceed the City's normally acceptable standard of 60 dBA L_{dn} for transportation noise source impacts on new residential development, as well as exceed the City's 45 dBA L_{dn} residential interior noise level standard.

Mitigation Measure NOISE-CUM-2: See Mitigation Measure NOISE-1.

Significance After Mitigation: Based on the sound wall modeling results, construction of a minimum 8-foot-high sound barrier wall or wall/berm along Leisure Town Road, and a minimum 6-foot-high sound barrier wall or wall/berm along Elmira Road, as described in Mitigation Measure NOISE-1, would reduce the traffic noise levels from Existing 1990 General Plan Conditions in 2035 + Brighton Landing Specific Plan at on-site residential outdoor active use areas to a *less-than-significant* level.

b. Substantial Permanent Noise Increase

A significant cumulative impact would also occur if there would be *any* increase in ambient noise levels at existing sensitive receptors in the Specific Plan area vicinity that are currently exposed to noise levels above the City's conditionally acceptable threshold for that type of land use. As shown in Table 4.11-12, no existing traffic noise levels exceed the City's conditionally acceptable maximum threshold of 75 dBA L_{dn} for residential land uses. Based

TABLE 4.11-12 **CUMULATIVE WITH PLUA TRAFFIC NOISE (dBA, Ldn)**

Roadway Segment	Cumulative Without PLUA + Project[b]	Cumulative with PLUA[b]	Increase from Cumulative Without PLUA + Project
Leisure Town Rd – Orange Dr to Sequoia Dr	69.8	69.8	0.0
Leisure Town Rd – Sequoia Dr to Ulatis Dr	69.3	69.2	-0.1
Leisure Town Rd – Ulatis Dr to Elmira Rd	69.0	69.1	0.1
Leisure Town Rd – Elmira Rd to Marshall Rd	69.2	69.4	0.2
Leisure Town Rd – Marshall Rd to Alamo Dr	68.7	68.8	0.1
Leisure Town Rd – Alamo Dr to Vanden Rd	68.0	67.9	-0.1
Ulatis Dr – west of Leisure Town Rd	61.3	61.7	0.4
Elmira Rd – Z Street (new) to Leisure Town Rd	66.9	67.0	0.1
Elmira Rd – Leisure Town Rd to Christine Dr	67.2	67.4	0.2
Elmira Rd – Christine Dr to Nut Tree Rd	67.7	67.9	0.2
Elmira Rd – Nut Tree Rd to Allison Dr	67.7	67.7	0.0
Elmira Rd – Allison Dr to Peabody Rd	69.2	69.1	-0.1
Marshall Rd – Leisure Town Rd to Nut Tree Rd	55.5	56.0	0.5
Marshall Rd – Nut Tree Rd to Peabody Rd	59.0	59.0	0.0
Alamo Dr – Leisure Town Rd to Vanden Rd	66.7	67.3	0.6

[a] As measured at the equivalent distances to 50 feet from the centerline of the outermost travel lane of the ultimate roadway alignments in order to provide comparable noise level comparisons to cumulative modeled scenarios.

[b] As measured at 50 feet from the centerline of the outermost travel lane assuming the ultimate roadway alignments as shown in the Brighton Landing Specific Plan.

Source: LSA Associates Inc., January 2012.

on the U.S. EPA's Protective Noise Levels,[7] with a combination of walls, doors, and windows, standard construction for northern California residential buildings provide approximately 25 dBA in exterior-to-interior noise reduction with windows closed and 15 dBA or more with windows open.

During field reconnaissance during noise measurements and thorough analysis of aerial imagery it was observed that current residential land uses along these roadway segments already have some form of mechanical ventilation systems installed. These existing alternative ventilation systems, which permit windows to be closed for prolonged periods of time, would reduce even the highest cumulative traffic noise levels to meet the City's interior noise level goal of 45 dBA L_{dn} for residential land uses (i.e., 69.8 dBA – 25 dBA = 44.8 dBA). In addition, most existing residential land uses that adjoin the modeled roadways have some type of protective sound wall. Therefore, cumulative buildout of the Specific Plan in the year 2035, together with all other planned and approved projects, would have a *less-than-significant* impact on all off-site sensitive receptors, including on existing neighborhoods west of Leisure Town Road.

3. With Proposed General Plan Update[8] Conditions

This section describes potential impacts which could occur as a result of buildout of the Specific Plan under Cumulative conditions with development associated with the City's General Plan Update proposed land use amendment (PLUA).

Similar to the impacts described above from buildout of the Specific Plan together with development of the existing 1990 General Plan and all other approved projects, cumulative noise impacts would primarily result from traffic noise sources on local roadways. As shown in Table 4.11-12, traffic noise

[7] EPA 550/9-79-100, November 1978.

[8] Land uses are shown on the Preferred Land Use Alternative accepted by the City Council on December 13, 2011. Although the update is in progress, and the General Plan in draft form, policies are subject to change and have not therefore been taken into account in this analysis.

levels under buildout associated with the PLUA would be nearly equivalent to those that would be experienced under the Cumulative Impacts (under the 1990 General Plan) conditions, as traffic distribution would change slightly with implementation of the proposed land use plan. Similar to the cumulative impacts of the proposed Specific Plan under the existing General Plan buildout conditions, on-site traffic noise would be reduced with implementation of Mitigation Measure NOISE-1. Similarly, traffic noise associated with buildout of the Specific Plan would have minimal impacts on off-site sensitive receptors under the City's General Plan update PLUA conditions and no mitigation would be required.

4.12 POPULATION AND HOUSING

This chapter describes existing population and housing characteristics in the Specific Plan area and Vacaville, and evaluates the potential population and housing impacts associated with implementation of the Specific Plan. This chapter also includes a discussion of cumulative impacts.

A. Regulatory Framework

1. Regional Housing Needs Allocation

The California Department of Housing and Community Development (HCD) identifies the supply of housing necessary to meet the existing and projected growth in population and households in the State, and passes a portion along to each of the State's 38 Councils of Governments (COG). As the local COG, the Association of Bay Area Governments (ABAG) receives a Regional Housing Needs Allocation (RHNA) from HCD that specifies the number of units, by affordability level, that need to be accommodated within the nine-county Bay Area during the Housing Element planning period, or cycle. ABAG is then responsible for calculating specific RHNAs for Vacaville and other jurisdictions, with input from the jurisdictions.

The RHNA for the City of Vacaville for the current 2007 to 2014 planning period includes a total of 2,901 units, and the Vacaville 2007-2014 Housing Element accommodates this need.[1] None of the RHNA requirement is accommodated by the Specific Plan.[2]

2. Association of Bay Area Governments Projections 2009

ABAG is the official comprehensive planning agency for the San Francisco Bay region, which is composed of the nine counties of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma, and which contains 101 cities. ABAG produces growth forecasts on four-year cycles so that other regional agencies, including the Metropolitan Transportation Commission (MTC) and the Bay Area Air Quality Management District

[1] City of Vacaville, 2010. *Vacaville 2007-2014 Housing Element.*

[2] City of Vacaville, 2010. *Vacaville 2007-2014 Housing Element,* page 94.

(BAAQMD) can use the forecast to make project funding and regulatory decisions. The next set of growth forecasts will be published in 2013.[3]

ABAG projections are the basis for the Regional Transportation Plan (RTP) and the regional Ozone Attainment Plan. In this way, ABAG projections have practical consequences that shape growth and environmental quality. The General Plans, zoning regulations, and growth management programs of local jurisdictions inform the ABAG projections. The ABAG projections are also developed to reflect the impact of "smart growth" policies and incentives that could be used to shift development patterns from historical trends toward those which: support a better jobs-housing balance; increase preservation of open space; and promote greater development and redevelopment in the urban core and in transit-accessible areas throughout the Bay Area.

3. Vacaville 2007-2014 Housing Element

The most recent Vacaville Housing Element was adopted on April 27, 2010 and HCD has certified that it meets State requirements. The 2007-2014 Housing Element includes a housing needs assessment that identifies current and projected housing needs, as well as policies to accommodate housing development that will be affordable to a range of household types and income levels. Policies related to population and housing in Vacaville are listed in Table 4.12-1.

4. Vacaville 1990 General Plan

The 1990 General Plan outlines a vision for Vacaville that includes support for a variety of neighborhoods, with housing of various types, densities, and prices, accommodating all income levels and ages and blending new development successfully into existing neighborhoods. The 1990 General Plan contains policies related to population and housing as listed in Table 4.12-2.

[3] Hing Wong, ABAG. Personal communication with The Planning Center | DC&E, December 8, 2011.

TABLE 4.12-1 **HOUSING ELEMENT POLICIES RELEVANT TO POPULATION AND HOUSING**

Policy Number	Policy Content
Policy H.1-G 1	Ensure a supply of housing of differing type, size, and affordability in order to meet Vacaville's housing needs for the current and future residents and workers within the community.
Policy H.1- G 2	In conjunction with policies in the Land Use Element of the Vacaville General Plan, ensure that an adequate supply of developable land is available to meet Vacaville's housing need, particularly for affordable housing.
Policy H.1- G 4	Ensure the development and availability of housing appropriate for special needs groups including young adults, young families, seniors, disabled and homeless.
Policy H.1- G 6	Aggressively participate in all programs, State and federal, private and public, suitable for maintaining and increasing the supply of affordable housing.
Policy H.1- I 3	Consider an amendment to the Land Use and Development Code to allow innovative and affordable housing within new single-family subdivisions. This could include provisions that allow duplexes to be built on the larger corner lots and secondary living units to be built in conjunction with new homes.
Policy H.1- I 4	Consider implementation of a program to allow payment of development impact fees for new residential construction to be deferred and paid prior to the City's approval of occupancy.
Policy H.1- I 15	Consider an amendment to the Land Use & Development Code and/or the Single Family Design Guidelines to include alternative development and design standards for small lot subdivisions, specifically for lots smaller than 5,000 square feet and for affordable housing developments.

TABLE 4.12-2 **1990 GENERAL PLAN POLICIES RELEVANT TO POPULATION AND HOUSING**

Policy Number	Policy Content
Policy 2.1-G 8	Preserve the predominant single-family residential character of Vacaville while providing other housing opportunities. Protect established neighborhoods from incompatible uses.
Policy 2.2-G 2	Establish a growth strategy for the urban service zone which matches residential growth with adequate public facilities. Monitor the rate of non-residential growth to ensure that it does not overburden the City.
Policy 2.2-G 6	Strive to maintain a reasonable balance between potential job generation and the local job market with a long-term goal of one job for each employed resident.
Policy 2.2-G 7	Strive to maintain a reasonable balance between new job income levels and housing costs within the City, recognizing the importance of housing choice and affordability to economic development in the City. It is important for there to be housing opportunities for all residents in the City, including higher income corporate executives and lower income wage earners.
Policy 2.2-G 10	Ensure that all new urban development within the Planning Area occurs within the City of Vacaville. A single exception is the Elmira area where infill of the townsite area under the jurisdiction of the Solano County is anticipated. New urban developments within the City limits are expected to annex to the City of Vacaville as a prerequisite to development.
Policy 2.5-G 2	Provide a citywide housing mix of approximately 60 percent single-family detached 20 percent single-family with zero lot lines, duplexes, triplexes, mobile homes, and townhouses, and 20 percent garden apartments and condominiums. To achieve this approximate housing mix citywide, new development areas must contain a larger component of certain housing types, as specified in Policy 2.5-I 3. The citywide housing mix policy is a goal which is intended to encourage a broad range of housing types within Vacaville. The policy reflects the housing mix goal for the City at buildout of the General Plan, but is not intended as a rigid numerical requirement. It can be expected, especially due to fluctuations in the housing market that the actual housing mix will vary slightly from the goal, both in the interim and at buildout.
Policy 2.5-G 4	Broaden the choice of type, size, and affordability of single-family homes.

Policy Number	Policy Content
Policy 2.5-I 1	Maintain adopted regulations to ensure residential densities remain within the ranges designated on the General Plan map based on the characteristics of each site and its surroundings and on General Plan policies. Require that all development be subject to site development and design review.
Policy 2.5-I 6	Locate lower-density housing at the edge of the planned urban area to buffer rural residential from higher urban density housing.
Policy 2.5-I 10	Require impact fees from developers, as appropriate and necessary, for provision of community facilities and services. Maintain the existing policy that development "must pay its own way."
Policy 2.5-I 13	Require that all residential development meeting one or more of the following criteria be subject to discretionary review as a planned development or similar procedure, consistent with the adopted Planned Development Regulation:
Policy 2.10-G3	Locate shopping centers and neighborhood commercial facilities at the intersection of major thoroughfares, and, where appropriate, adjacent to multifamily housing, and minimize conflicts between commercial areas and residences by requiring adequate buffers and screening.

Source: City of Vacaville, *Vacaville General Plan*, 1990.

5. Vacaville Municipal Code

The Land Use and Development Code, Title 17 of the Municipal Code, applies zoning districts to properties within the City of Vacaville. The purpose of the zoning districts is to implement the land use designations established by the 1990 General Plan. For each 1990 General Plan land use designation, there is, at a minimum, one zoning district. The Specific Plan area is zoned as Agriculture (AG) and allows land uses consistent with or related to the commercial raising of produce and livestock.

B. Existing Conditions

This section describes existing population and housing conditions in the City of Vacaville. The US Census Bureau's 2010 Census data presents the most up-to-date demographic profile available for Vacaville. However, regional planning initiatives, including RHNA, are based on ABAG's Projections 2009. Therefore, both the Census data and ABAG's 2009 projections for population and housing data are described below.

1. Vacaville Population

In 2010, the US Census reported that the population of Vacaville was 92,428. This has increased from 88,625 in 2000.[4]

As shown in the ABAG 2009 population, housing, and employment projections in Table 4.12-3, Vacaville's population is projected to grow to a total of 111,100 by 2035, which would be an 11 percent increase from 2010.[5] This level of growth is consistent with the overall growth rate projected for Solano County.

2. Vacaville Housing

In 2010, the U.S. Census Bureau reported 32,814 housing units in Vacaville. The ABAG 2009 housing projections in Table 4.12-3 predict that the number of households in Vacaville will increase to 36,720 by 2035, a 12 percent increase.[6]

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[4] U.S. Census Bureau American FactFinder, http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml, accessed on January 12, 2012.

[5] ABAG, *Projections and Priorities 2009: Building Momentum*, Projections through 2035.

[6] ABAG, *Projections and Priorities 2009: Building Momentum*, Projections through 2035.

TABLE 4.12-3 **ABAG PROJECTIONS 2009 POPULATION, HOUSEHOLDS AND EMPLOYMENT FORECASTS FOR VACAVILLE**

					Change 2010-2035	
	2000	2005	2010	2035	Number	Percent
Population	88,625	96,300	99,700	111,100	11,400	11
Households	28,105	31,250	32,170	36,720	4,550	14
Jobs	25,660	29,240	28,380	42,110	13,730	48

Source: ABAG, Projections and Priorities 2009: Building Momentum, Projections through 2035.

3. Vacaville Employment

Vacaville has a concentration of health, educational and recreational service jobs. According to the ABAG 2009 job projection, Vacaville's major employment sectors in 2010 were service (49.30 percent), retail (15.76 percent), and manufacturing, wholesale, and transportation (15.70 percent).[7]

4. Specific Plan Area

There are currently two owner-occupied houses in the Specific Plan area.

Detailed employment data from the 2010 Census were not available at the time this EIR was prepared; however, analysis of available employment data for the census tract in which the Specific Plan area is located indicate that approximately 221 people work in the vicinity of the Plan Area in 2009.[8] Within the Specific Plan area itself, current jobs would likely consist of a small number of agricultural positions.

[7] ABAG, *Projections and Priorities 2009: Building Momentum*, Projections through 2035.

[8] U.S. Census Bureau and LEHD Origin-Destination Employment Statistics, OnTheMap Application, http://lehdmap.did.census.gov/, retrieved on January 10, 2012.

C. Standards of Significance

The Specific Plan would have a significant impact with regard to population and housing if it would:

1. Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)
2. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere, or
3. Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere

D. Project Impacts

1. Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)

a. Direct Growth Inducement

For the purposes of this EIR, the Specific Plan would be considered to result in a substantial and unplanned level of growth if estimated buildout under the Specific Plan would exceed Vacaville's growth projections. One way to determine whether a growth-inducing impact would occur under CEQA is to evaluate whether the growth resulting from the Specific Plan is within the growth projections established by the local jurisdiction's General Plan. As presented in Table 4.12-3, addition of the Specific Plan's 769 housing units and 2,107 associated new residents would be within the growth projected under the 1990 General Plan and within the growth projected by ABAG. According to the 2010 Census, Vacaville currently has 92,428 residents, and the additional 2,107 would represent a 2.28 percent increase, which is relatively small. There would therefore be a *less-than-significant* impact.

Environmental impacts that directly and indirectly result from this growth and the associated extension of roads and infrastructure to the Specific Plan

area have been analyzed in other sections. Section 4.15 Utilities and Service Systems describes how adequate utilities are provided to support this growth, and Section 4.13 Public Services, how development impact fees and other mechanisms would be used to assure adequate provision of public services for these new residents. The environmental impacts from construction of public service facilities would be analyzed in project-specific CEQA documents. Impacts that result from population growth, such as increased GHG emissions, traffic, noise, and air quality, and potable water supply are also described in their respective sections and are not repeated here.

b. Indirect Growth Inducement

Indirect growth inducement could occur if the Specific Plan were to involve the extension of roads or other infrastructure into undeveloped or underdeveloped areas. Infrastructure and other urban services to support development under the Specific Plan would be extended and enlarged to previously unserved areas and to handle anticipated future increases in demand, including the installation of a detention basin and a regional sewer system sized to serve additional future development in Vacaville. Some of this future development would be located to the north and south of the Brighton Landing Specific Plan area. Although these adjacent areas are within the City's 2008 Urban Growth Boundary, they are currently designated for Estate Residential, School and Park uses under the 1990 General Plan and for agricultural use for those areas outside the City's sphere of influence. These areas are identified for growth in the Preferred Land Use Alternative prepared for the Proposed General Plan Update. However, the Preferred Land Use Alternative and the Proposed General Plan Update have not been published, formally adopted, or reviewed for potential environmental impacts. Therefore, Specific Plan implementation would indirectly induce growth into areas for which adequate planning has not yet been completed and a *significant* impact would thus occur.

Impact PH-1: Extension of roads, sewer, and other infrastructure into and adjacent to undeveloped areas would occur under the Specific Plan, indirectly inducing growth to the north and south, resulting in a *significant* impact.

Mitigation Measure PH-1: There is no available mitigation measure.

Significance After Mitigation: This impact could only be mitigated by sizing the infrastructure within the Brighton Landing Specific Plan to serve only the project itself. However, this would be contrary to established City policies regarding the efficient provision of services and requiring services to be in place to serve new development at the time that it is built. Therefore, there is no feasible mitigation and this impact remains *significant and unavoidable*.

2. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

The Specific Plan would have a significant environmental impact if it would directly require the displacement of a substantial number of existing housing units, thereby requiring construction of replacement housing elsewhere. There are two existing housing units in the Specific Plan area, in Subarea O. The Specific Plan includes three possible scenarios for this subarea: becoming part of the private high school site, redevelopment as Neighborhood Commercial uses, and the retention of the existing homes plus construction of additional single-family homes. If Subarea O was redeveloped with non-residential uses, two homes would be displaced. However, the removal of two houses does not constitute a substantial number of housing units; therefore any impact would be *less than* significant.

3. Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

If the Specific Plan would directly require the displacement of a substantial number of people, thereby requiring construction of replacement facilities and services elsewhere, then it would have a significant environmental impact. As described above, there are no plans to remove the existing houses, although there could be future plans with potential for residents to be displaced. However, as discussed above, adoption of the Specific Plan would not displace a substantial amount of housing, so it follows that it also would not displace a substantial number of people. Therefore, the Specific Plan would

have a *less-than-significant* impact on the displacement of substantial numbers of people.

E. Cumulative Impacts

1. With Approved Projects

This cumulative analysis considers the Specific Plan in the context of approved projects in Vacaville. The bulk of approved projects are residential developments to the south of the Specific Plan area, along the urban growth boundary. Projected growth in housing units and population for the Specific Plan area, together with approved projects, is well within housing and population projections for Vacaville through 2035 (see Table 4.12-4). Specific Plan implementation would not result in the displacement of a significant number of existing residents and dwelling units. However, as mentioned previously, the installation of the detention basin and regional sewer system, as required to meet the needs of Proposed Project at buildout, may indirectly induce growth by providing new infrastructure. Therefore, approved project-related growth in Vacaville, together with the Proposed Project would have a *significant* cumulative impact with respect to growth inducement or displacement of people and housing.

Impact PH-CUM-1: Extension of roads, sewer, and other infrastructure into undeveloped areas would occur under the Specific Plan, which, together with approved projects, would indirectly induce unplanned growth, resulting in a *significant* impact.

Mitigation Measure PH-CUM-1: There is no available mitigation measure.

Significance: This impact could only be mitigated by sizing the infrastructure within the Brighton Landing Specific Plan to serve only the project itself. However, this would be contrary to established City policies regarding the efficient provision of services and requiring services to be in place to serve new development at the time that it is built. There-

fore, there is no feasible mitigation and this impact remains *significant and unavoidable*.

2. Under Existing 1990 General Plan

This section analyzes potential impacts to population and housing that could occur from a combination of the Specific Plan with buildout of the 1990 General Plan. Most of the Specific Plan area was not included in population and housing projections in the 1990 General Plan, as it was primarily designated agricultural land. Approximately 60 acres of the Specific Plan area is included in the 1990 General Plan as Estate Residential, which allows 0.5 to 3 units per acre, or a maximum of 180 units. Therefore, Specific Plan-associated growth, together with 1990 General Plan population and housing at buildout, would exceed projections. However, the quantity of growth contributed by the proposed Project at buildout (i.e. 2,107 additional residents and 769 additional housing units) is not substantial when compared to the projected population for Vacaville of 116,540 residents and 36,720 housing units, as demonstrated in Table 4.12-4. Therefore, the cumulative impact of the Specific Plan in combination with build-out of the 1990 General Plan would be *less than significant*.

3. With Proposed General Plan Update

As part of the Proposed General Plan Update process,[9] a Preferred Land Use Alternative map was created which shows more intensive and higher density land uses in Vacaville. This would lead to accompanying increases in population and housing, which may exceed those predicted by either the 1990 General Plan or ABAG. There is a potential that the land uses on the Preferred Land Use Alternative map, when taken in concert with the Specific Plan and other reasonably foreseeable plans and projects, would have an effect on population and housing by leading to substantial growth inducement.

[9] Land uses are shown on the Preferred Land Use Alternative accepted by the City Council on December 13, 2011. Although the update is in progress, and the General Plan in draft form, policies are subject to change and have not therefore been taken into account in this analysis.

TABLE 4.12-4 **POTENTIAL CUMULATIVE IMPACTS ON POPULATION AND HOUSING**

	Population[a]	Housing
Existing Conditions		
2010 Census data	92,428	31,092
Project		
Brighton Landing Specific Plan	2,107	769
Other Approved Projects		
Lower Lagoon Valley Specific Plan	2,809	1,025
Southtown Project	3,863	1,410
TOTAL	99,631	33,721
Projections		
1990 General Plan projection	116,540	42,533
ABAG 2035 projection	111,100	36,720

[a] Population was estimated by multiplying the proposed number of dwelling units by 2.74 persons per household. The persons per household data is from the State of California, Department of Finance, May 2010, E-5 Population and Housing Estimates for Cities, Counties, and the State, 2001-2010, with 2000 Benchmark. All population and housing numbers are rounded to the nearest whole number.

Sources: The Planning Center | DC&E, *Population and Housing Conditions and Trends*, 2010; ABAG, Projections and Priorities 2009: Building Momentum, Projections through 2035; City of Vacaville, *Lower Lagoon Valley Specific Plan EIR*, February 2004; City of Vacaville, *Vanden Meadows Specific Plan*, 2010.

4.13 PUBLIC SERVICES AND RECREATION

This chapter describes the existing public service conditions in the Specific Plan area and evaluates the potential impacts of the Specific Plan on those services. Police, fire, schools, libraries, and parks and recreational facilities are each addressed in a separate section of this chapter.

A. Police

1. Regulatory Framework

a. Vacaville Police Department Mission, Vision, and Values Statement

VPD is guided by a statement of core values. The core values of VPD include:

- Integrity in Their Actions
- Service to the Community
- Ethical Conduct and Decision-Making
- Respect for Human Dignity

b. Vacaville 1990 General Plan

Police service is addressed in the Public Facilities, Institutions, and Utilities Element of the 1990 General Plan (existing General Plan). The policies related to police services are listed in Table 4.13-1.

2. Existing Conditions

a. Vacaville Police Department

The Vacaville Police Department (VPD) provides service to a 28-square-mile area serving a population of approximately 96,450 people within the City of Vacaville. Responsibilities of VPD include a 24 hours a day, 7 days a week communication center, crime suppression and prevention, investigations, traffic patrol, and emergency service. In addition, VPD oversees the Reserve Officer and Cadet Programs and administers specialty units, such a Special Weapons and Tactics (SWAT) team, a Mobile Field Forces (MFF) team, Youth Services, K-9 units, the Family Investigative Response Services Team

TABLE 4.13-1 **1990 GENERAL PLAN POLICIES RELATED TO POLICE SERVICE**

Policy Number	Policy
Policy 2.2-I 8	Maintain and refine the Planned Growth Ordinance and allow urban development only in accord with this plan for full urban services (police, fire, parks, water, sewer, streets, and storm drainage). Areas lacking full services are deemed outside the urban-service area, are unsuited for urban development regardless of Plan designation until services are assured and shall not be identified in a phasing plan.
Policy 2.3-I 21	In conjunction with the consideration of a Specific Plan for the property located east of Leisure Town Road and south of the Locke Paddon subdivision (within the existing Urban Service Area), a determination shall be made regarding the potential expansion of the Urban Service Area to the east in order to establish a permanent agricultural buffer on the eastern edge of the City. The City will allow no development east of Leisure Town Road until this determination is made. This will also ensure that any development and extension of urban services and infrastructure east of Leisure Town Road is not planned in a piecemeal manner.
Policy 2.5-G 7	Ensure that new residential development shares the cost of providing services and amenities for Vacaville residents.
Policy 2.5-I 10	Require impact fees from developers, as appropriate and necessary, for provision of community facilities and services. Maintain the existing policy that development "must pay its own way."
Policy 5.1-G 2	Develop a plan and standards for the provision of public services, including fire and police services.
Policy 5.1-G 4	Plan for public safety facilities for new areas. Maintain comprehensive Hazardous Materials and Emergency Response plans.
Policy 5.1-I 6	Develop a Public Safety facilities plan. Include the following elements in the Plan: ¨ An analysis of current facilities and equipment, and their adequacy to service the existing planning area. ¨ Projections of the impacts of new development in the provision of public safety services to the existing and new areas of the community. These projections should include the adequacy of facilities and equipment, response times, communications systems and the adequacy of the water system for firefighting needs. ¨ Implement response times which have been established for po-

Policy Number	Policy
	lice, fire and emergency medical services, and provide personnel and facilities to meet the established standards. ¨ Establish hazardous materials use, storage and disposal standards. ¨ Development of a detailed Wildland Fire Hazard Area map for areas of local responsibility.
Policy 5.1-I 12	Do not approve any development that will not, even with identified mitigation measures, maintain standards for water, sewer, police, and fire service unless there are overriding findings of special circumstances or economic or social benefits and the service standards will be achieved at the time of project occupancy.

Source: City of Vacaville, 1990. *Vacaville General Plan*.

(FIRST), the Family Resource Center (FRC), and a clinical services component.[1]

i. Staffing

VPD employs 103 sworn officers and 58 non-sworn, full-time personnel. Due to budget constraints, several full-time positions remain unfulfilled, including 13 sworn personnel and 12 non-sworn personnel positions. Additionally, the VPD currently has some positions that are vacant which they are not seeking to fill due to economic constraints.[2]

Public safety Community Facilities Districts (CFDs) have been formed to fund the increased staffing needs from new development to help maintain existing levels of service. Recent new development projects and the anticipat-

[1] Vacaville Police Department website, http://www.ci.vacaville.ca.us/departments/police/, accessed on April 29, 2010.

[2] Courtemanche, Craig, Lieutenant, Vacaville Police Department. Personal communication with Melissa McDonough, The Planning Center | DC&E, April 16, 2010.

ed staffing needs are listed below; the additional staffing will be funded through the CFDs:[3]

- North Village (CFD #8): 5 additional staff
- Portofino (CFD #9): 1 additional staff
- Rice McMurtry (CFD #10): 2 additional staff
- Southtown (CFD #11): 4 additional staff
- Lagoon Valley (future CFD): 8.6 additional staff
- Residential Infill Sites (CFD #12): 2 additional staff

ii. Facilities

There is one main VPD police station, which is located at 660 Merchant Street, adjacent to Vacaville City Hall. Additionally, the Family Resource Center and FIRST are located at a leased facility at 320 Cernon Street. Currently VPD does not have any plans to expand its facilities; however, a proposed new Fire Station near the Specific Plan area would likely include an office for VPD use.[4]

iii. Service Standards

Although VPD does not have a standard for staffing levels, the current ratio of officers per 1,000 residents is 1.12 (1.121,000). This is lower than the Federal Bureau of Investigations recommended standard of two officers per 1,000 residents (2:1,000).

VPD has adopted standards for average response times. For Priority I calls, which are the highest priority and involve crimes in progress or people in physical jeopardy, the adopted response time standard is 6 minutes and 1 second. VPD is currently meeting the Priority I standard with an average response time of 6 minutes exactly. For Priority II calls, which are calls that do not need an immediate response, the adopted average response time stand-

[3] City of Vacaville, 2007. *Infrastructure, Facilities and Services Status Report*, page 63.

[4] Buderi, Fred, Planning Director, Community Development Department, City of Vacaville. Personal communication with Melissa McDonough, The Planning Center | DC&E, January 23, 2012.

ard is 16 minutes and 28 seconds. VPD is currently meeting the Priority II call standard, with an average response time of 15 minutes.[5]

3. Standards of Significance

The Specific Plan would have a significant impact with regard to police services if it would result in substantial adverse physical impacts associated with the provision of new or physically altered police facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives.

4. Project Impacts

At buildout, the Specific Plan would consist of 769 detached single-family homes, resulting in approximately 2,107 residents. As noted on page 91 of the Draft Specific Plan, the City would require the project area to annex into Community Facilities District (CFD) #12 as the mechanism to pay for new police services.

a. Service Ratios

The VPD strives to maintain a ratio of approximately one officer per one thousand residents. For this ratio to be maintained, the VPD would need two additional officers, with associated equipment and vehicle(s). These new personnel could be accommodated without the addition of new facilities.[6] Since no additional facilities would be necessary there would be a *less-than-significant* impact.

b. Response Times

As mentioned earlier, the VPD currently is meeting its adopted service standard for response times. However, at buildout, the 2,107 residents from the Specific Plan area would be likely add to the demand for police services and

[5] Courtemanche, Craig, Lieutenant, Vacaville Police Department. Personal communication with Carey Stone, April 16, 2010.

[6] Buderi, Fred, Planning Director, Community Development Department, City of Vacaville. Personal communication with Melissa McDonough, The Planning Center | DC&E, January 23, 2012.

potentially reduce the VPD's ability to meet its adopted response times. This potential deficiency could be addressed by the aforementioned provision of two additional officers, with associated equipment and vehicle(s). These new personnel could be accommodated without the addition of new facilities. Since no additional facilities would be necessary there would be a *less-than-significant* impact.

Additionally, in order to meet its adopted response times, VPD must be able to reach an area and that roads and entrances are sufficient to provide that access. This issue is discussed more fully in Section 4.8, Hazards and Hazardous Materials and in Section 4.14, Traffic and Transportation.

c. Facilities

According to adopted service ratios and response time standards, the additional residents associated with buildout of the Specific Plan would require the provision of two new officers and related equipment and vehicles. As mentioned previously, VPD facilities are not at full capacity and thus would be able to absorb two additional officers. New facilities would not be needed, and existing facilities would not be negatively impacted. Therefore, the impact would be *less than significant*.

5. Cumulative Impacts

As explained earlier, a series of community facility districts (CFDs) provide a funding mechanism for the provision of adequate services All approved projects and any development under build-out of either the 1990 General Plan or the Proposed General Plan Update would form new CFDs or join existing CFDs. The Specific Plan indicates that project developers will pay their fair share of Police Impact fees and annex into Community Facility District (CFD) #12. Although it is possible that future development in Vacaville would necessitate the construction of new police facilities, the Brighton Landing project would not trigger the need for any new construction, and would therefore have a less-than-significant contribution to any cumulative impacts from construction of new police facilities. Overall, the Specific Plan would

not have significant cumulative impacts related to the adequate provision of police services. A *less-than-significant* cumulative impact would occur.

B. Fire

1. Regulatory Framework

State and local regulations, plans, and policies provide the regulatory framework for fire protection services in the study area.

a. State Regulations and Plans

This section describes the State regulations and plans that pertain to fire protection services in the study area.

i. California Government Code

Section 65302 of the California Government Code requires General Plans to include a Safety Element, which must include an assessment of wildland and urban fire hazards. Chapter 9 of the 1990 General Plan satisfies this requirement.

ii. California Code of Regulations

Title 24, also referred to as the California Building Standards Code, is published in its entirety every three years by order of the California Legislature. Title 24 building regulations and standards have the force of law. In addition, Title 19 pertains to fire prevention and engineering measures for new construction. Vacaville's Land Use and Development Code adopts the California Building Standards Code.

iii. California Public Resources Code

Section 4290 of the Public Resources Code (PRC) includes fire safety regulations that apply to development in Vacaville. This section establishes minimum standards for roads, signage, private water supply resources, and wildland fuel modification. Section 4290 works in conjunction with current and new building construction development standards in State Responsibility Areas (SRAs), defined by the State Board of Forestry and Fire Protection as

an area in which the State has primary financial responsibility for preventing and suppressing fires. Section 4291 of the PRC requires annual defensible space of 100 feet to be provided around all structures in or adjoining any mountainous area, forest-covered lands, brush-covered lands, grass-covered lands, or any land that is covered with flammable material, including land with such characteristics located in portions of the 1990 General Plan study area.

iv. California Fire Code

The California Fire Code incorporates, by adoption, the International Fire Code of the International Code Council, with California amendments. This is the official Fire Code for the State and all political subdivisions. It is located in Part 9 of Title 24 of the California Code of Regulations, which is described in Section B.2.a.ii. The California Fire Code is revised and published every three years by the California Building Standards Commission. Vacaville's Land Use and Development Code adopts the California Fire Code.

v. California Health and Safety Code and Uniform Building Code

The California Health and Safety Code provides regulations pertaining to the abatement of fire-related hazards. This Code also requires that local jurisdictions, including Vacaville, enforce the Uniform Building Code, which provides standards for fire-resistant building and roofing materials and other fire-related construction methods.

vi. California Fire Plan

The California Fire Plan is the State's "road map" for reducing the risk of wildfire. The overall goal of the Plan is to reduce total costs and losses from wildland fire in California through focused pre-fire management prescriptions and increased initial attack success. The Plan was adopted in March 1996 and is currently undergoing review and revision by the California Department of Forestry and Fire Protection (CAL FIRE). The Plan provides guidance to local jurisdictions, such as the City of Vacaville, to meet these State goals.

b. Vacaville 1990 General Plan

The 1990 General Plan (existing General Plan) addresses fire protection in the Land Use Element and the Public Facilities, Institutions, and Utilities Element. These policies are summarized in Table 4.13-2.

c. Vacaville Municipal Code

Within the Land Use and Development Title of Vacaville's Municipal Code (Code), is Chapter 14.20.290 Development Standards for New Construction Adjacent to Open Space Lands Where Wildfire is a Threat. Chapter 14.20.290 establishes standards which, among other things, require:

- A 50-foot fire buffer zone.[7]
- A fire access road, a fire protection greenbelt, a fire break, and/or a fire sprinkler system, under certain circumstances.
- Specific side and rear building setbacks.
- Single loaded streets, under certain circumstances.
- The use of noncombustible and fire retardant materials, for some structures and features.
- Adequate ingress and egress to all structures and improvements.

2. Existing Conditions

a. Vacaville Fire Department[8]

The Vacaville Fire Department (VFD) provides fire and emergency medical services to approximately 28 square miles of territory within the City of Vacaville, and emergency medical services to approximately 160 square miles of unincorporated county land surrounding the city. Emergency medical services provided by VFD include Advanced Life Support (ALS)/Emergency

[7] The more stringent State regulation, which requires a 100-foot buffer zone, supersedes this.

[8] This section is based on the following: John Jansen, Fire Battalion Chief, City of Vacaville. Personal communication with Tanya Sundberg, The Planning Center | DC&E, April 19, 2010.

TABLE 4.13-2 **1990 GENERAL PLAN POLICIES RELATED TO FIRE PROTECTION SERVICE**

Policy Number	Policy
Land Use Element	
Policy 2.2-I 8	Maintain and refine the Planned Growth Ordinance and allow urban development only in accord with this plan for full urban services (police, fire, parks, water, sewer, streets, and storm drainage). Areas lacking full services are deemed outside the urban-service area, are unsuited for urban development regardless of Plan designation until services are assured and shall not be identified in a phasing plan.
Policy 2.3-I 21	In conjunction with the consideration of a Specific Plan for the property located east of Leisure Town Road and south of the Locke Paddon subdivision (within the existing Urban Service Area), a determination shall be made regarding the potential expansion of the Urban Service Area to the east in order to establish a permanent agricultural buffer on the eastern edge of the City. The City will allow no development east of Leisure Town Road until this determination is made. This will also ensure that any development and extension of urban services and infrastructure east of Leisure Town Road is not planned in a piecemeal manner.
Policy 2.5-G7	Ensure that new residential development shares the cost of providing services and amenities for Vacaville residents.
Policy 2.5-I 10	Require impact fees from developers, as appropriate and necessary, for provision of community facilities and services. Maintain the existing policy that development "must pay its own way."
Public Facilities, Institutions, and Utilities Element	
Policy 5.1-G 2	Develop a plan and standards for the provision of public services, including fire and police services.
Policy 5.1-G 4	Plan for public safety facilities for new areas. Maintain comprehensive Hazardous Materials and Emergency Response plans.

Policy Number	Policy
Policy 5.1-I 6	Develop a Public Safety facilities plan. Include the following elements in the Plan: ¨ An analysis of current facilities and equipment, and their adequacy to service the existing planning area. ¨ Projections of the impacts of new development in the provision of public safety services to the existing and new areas of the community. These projections should include the adequacy of facilities and equipment, response times, communications systems and the adequacy of the water system for firefighting needs. ¨ Implement response times which have been established for police, fire and emergency medical services, and provide personnel and facilities to meet the established standards. ¨ Establish hazardous materials use, storage and disposal standards. ¨ Development of a detailed Wildland Fire Hazard Area map for areas of local responsibility.
Policy 5.1-I 12	Do not approve any development that will not, even with identified mitigation measures, maintain standards for water, sewer, police, and fire service unless there are overriding findings of special circumstances or economic or social benefits and the service standards will be achieved at the time of project occupancy.
Safety Element	
Policy 9.3-G 1	Reduce the risk of wildfires by implementing policies restricting development in Extreme and High Hazard areas.
Policy 9.3-G 2	Ensure adequate funding is available to provide fire protection services, equipment, and maintenance as new development takes place.
Policy 9.3-I 1	Establish Mello-Roos Community Facilities districts or other funding mechanisms to provide standby fire protection services, if necessary, because adequate funding will not otherwise be assured.
Policy 9.3-I 2	Implement Agricultural Hillside development standards in the zoning ordinance, as appropriate, to reduce the risk of structure fire in extreme or high fire danger areas.
Policy 9.3-I 3	Coordinate fire protection services with the other agencies to ensure minimum coverage for all areas within Vacaville's Planning Area.
Policy 9.3-I 4	Provide adequate access to and fire breaks adjoining open space areas subject to fire hazard as part of new developments.

Source: City of Vacaville, *Vacaville General Plan*, 1990.

Medical Service (EMS). VFD also organizes and conducts a fire prevention and public education program in Vacaville.

Fire-related calls for service include: structure, nuisance, vehicle, and vegetation fires; hazardous materials emergencies; technical emergencies such as trench, water, and confined space rescues; and vehicle accidents and extrication incidents involving automobiles, motorcycles, tractor trailers, and airplanes.

For emergency medical service, VFD provides ALS first responder and ALS transport services. These services include responding to minor injury and major traumatic injury incidents, as well as to general and major medical incidents. VFD responds to mass casualty incidents within its larger response area as part of a countywide mutual aid system for ambulances.

VFD also organizes fire prevention functions through its Support Services Division. These functions include the provision of fire safety inspections to Vacaville businesses by inspectors and suppression engine companies, as well as plan safety inspections for new construction projects, remodels, and sprinkler systems. Lastly, VFD provides disaster preparation and Emergency Operations training to City staff members. This training allows the City to set up and operate an Emergency Operations Center during emergencies.

i. Staffing

VFD currently employs 72 fire prevention, suppression, investigation, and administration personnel. Due to budget constraints, three positions remain unfilled: Division Chief, Assistant Fire Marshal, and Fire Prevention Specialist.[9] The following is a breakdown of existing VFD personnel by title and number of staff:

- Fire Chief (1)
- Division Chief (1)

[9] Vacaville Fire Department, *Fire Department Staffing*, http://www.cityofvacaville.com/departments/firestaffing.php, accessed on January 24, 2012.

- Battalion Chief (3)
- Captain (12)
- Engineer (15)
- Firefighter/Paramedic (22)
- Firefighter (13)
- Administrative Assistant (1)
- Senior Administrative Clerk (1)
- Fire Plans Examiner/Inspector (1)
- Fire Prevention Specialist (1)
- Special Projects Coordinator (1)

In 2003, VFD underwent a Standards of Response Coverage evaluation to help determine future staffing levels and facilities needed in order to provide adequate fire services to Vacaville.[10] This evaluation looked at existing deployment, community outcome expectations, a community risk assessment, a distribution study, a concentration study, historical reliability, historical response effectiveness studies, and an overall evaluation.[11] As part of this process, future development and consequent increases in population was taken into consideration.[12] The evaluation found that in 2003 staffing levels were just meeting the City's needs and concluded that as Vacaville grows along its outer areas, the City would require additional fire staff and stations in order to maintain adequate service.[13]

ii. Facilities

The administrative offices of VFD are located at Vacaville City Hall, 650 Merchant Street. This central facility includes the offices of the Fire Chief,

[10] City of Vacaville, 2003. *Standards of Response Coverage Study Volume 1 Final Report*, pages 5 to 6.

[11] City of Vacaville, 2003. *Standards of Response Coverage Study Volume 1 Final Report*, pages 5 to 6.

[12] City of Vacaville, 2003. *Standards of Response Coverage Study Volume 1 Final Report*, page 6.

[13] City of Vacaville, 2003. *Standards of Response Coverage Study Volume 1 Final Report*, page 1.

Division Chief, and administrative staff. It also houses the Support Services Division.

VFD has four existing fire stations in the city: Stations 71, 72, 73, and 74. Station 71, located at 111 South Orchard Avenue, serves as the main station, and is equipped with an extra apparatus bay for the storage of reserve equipment and fire fighting apparatus. Each station provides ALS/EMS service and responds to all types of fires, including wildland, structure, and vehicle fires. Table 4.13-3 provides each station's location, number of personnel, and all apparatus/equipment in operation at each station.

Planned facilities anticipated in the future include:

- The proposed Southtown Fire Station at Vanden and Cogburn Circle.
- A proposed fire station at Orange Drive just east of Leisure Town Road.
- Relocation of Fire Station 73 from Eubanks Court to somewhere in the vicinity of Brown Street and Browns Valley Parkway.
- Lower Lagoon Valley.

In addition to the equipment and apparatus listed in Table 4.13-3, VFD owns and operates the following equipment:

- Reserve Engine (3)
- Reserve Ambulance (2)
- Rescue Squad (1)
- Water Tender (1)
- Grass Unit (1)
- Command Vehicle (2)
- Trench Rescue Trailer (1)
- Community Response Trailer (2)
- Prevention/Investigation Trailer (1)
- ¾-Ton Pick Up Truck (1)
- Staff Vehicle (6)
- Boat (2)

TABLE 4.13-3 **FIRE STATION LOCATIONS AND RESOURCES**

Station	Address	Personnel	Apparatus/ Equipment
Station 71 (Main Station)	111 S. Orchard Ave.	5 total	Truck or Engine or Brush (1) Ambulance (1) Brush Unit (1)
Station 72	2001 Ulatis Drive	5 total	Type 1 Engine or Brush(1) Ambulance (1) Brush Unit (1)
Station 73	650 Eubanks Court	3 total	Type 1 Engine or Brush (1) Ambulance (1) Brush Unit (1)
Station 74	1850 Alamo Drive	5 total	Type 1 Engine or Brush(1) Ambulance (2) Grass Unit (1)

Source: Vacaville Fire Department, 2010.

Plans are in place for the development of three new stations and the relocation of one existing station.

iii. Service Standards

VFD maintains an adopted standard response time and success rate of 7 minutes for 90 percent of calls. This response time refers to the time period between VFD notification and arrival on the scene of the incident for calls within city limits.

3. Standards of Significance

The Specific Plan would have a significant impact with regard to fire and emergency services if it would result in substantial adverse physical impacts associated with the provision of new or physically altered fire service facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives.

4. Project Impacts

At buildout, the Specific Plan would consist of 769 detached single family homes, resulting in approximately 2,107 residents. The City would require the project area to annex into a Community Facilities District as the mechanism to pay for new fire services.

Because the Specific Plan site is located at the edge of the Urban Growth Boundary next to open lands where no development is anticipated in the near future, development within the Specific Plan area would be subject to the provisions of Chapter 14.20.290 of the Vacaville Municipal Code, summarized in Section B.1.c, above. Potential impacts from wildland fire hazards are addressed in Section 4.8, Hazards and Hazardous Materials, of this Draft EIR.

a. Service Ratios

The new residents of the Specific Plan area would increase demands on fire and emergency services. The City does not have adopted fire service ratios[14] According to the Vacaville Fire Chief, existing Station 72 and its associated personnel should be adequate to handle Specific Plan-related increases in population and fire and emergency service demand.[15] Since existing personnel are adequate to serve the population resulting from buildout of the Specific Plan, there would be no need to provide new or altered facilities, therefore there would be a *less-than-significant* impact.

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[14] As described in Section B.2 of this Chapter, a 2003 Standards of Response Coverage Study concludes that as Vacaville expands at its edges, the increased need for fire services will require additional fire personnel, facilities, and equipment in order to maintain adequate service. The Vacaville Fire Chief indicated that, as of 2012, the VFD has sufficient personnel, equipment, and facilities to meet the demand associated with buildout of the Specific Plan. While this study may not provide the fine grained detail necessary to analyze the adequacy of fire services for a particular area under current conditions, its general conclusion that future growth will require the provision of additional fire personnel, facilities, and equipment is still valid.

[15] Preciado, Brian, Fire Chief, City of Vacaville. Personal communication with Melissa McDonough, The Planning Center | DC&E, January 11, 2012.

b. Response Times

The VFD currently meets its seven minute response time standard on the majority of its calls. As mentioned previously, increases in fire and emergency service demand generated by buildout of the Specific Plan would be adequately met by existing personnel and response times would not be expected to increase as a result of the proposed project.[16]

However, response time is not only based on adequate staffing levels but also on ability to access and evacuate the project area. The phasing of the proposed Project may result in impacts to response time or ability because the Specific Plan will provide only one access point for the first several phases of a few hundred homes. An additional access point is necessary in case of a blockage on Elmira Road. This issue is discussed in Section 4.8, Hazards and Hazardous Materials. As there would be no need to provide new or altered facilities, there would be a *less-than-significant* impact.

c. Facilities

Existing Station 72 would be adequate to meet the increased demands on fire and emergency services associated with buildout of the Specific Plan.[17] Additionally, several new fire stations are planned in Vacaville, including one in the vicinity of the Specific Plan Area. Since existing facilities will suffice to serve Specific Plan buildout, there would be a *less-than-significant* impact to fire and emergency services.

5. Cumulative Impacts

The VFD uses a complex method to determine adequate service provision, staffing levels, and equipment and facility needs. While there is no direct ratio between number of residents and the need for new fire or emergency personnel, equipment or facilities, there is evidence that new development will at some point reach a level which requires provision of new and additional per-

[16] Preciado, Brian, Fire Chief, City of Vacaville. Personal communication with Melissa McDonough, The Planning Center | DC&E, January 11, 2012.

[17] Preciado, Brian, Fire Chief, City of Vacaville. Personal communication with Melissa McDonough, The Planning Center | DC&E, January 11, 2012.

sonnel, equipment, and facilities.[18] Fire and emergency service needs would be considered on a City-wide level.

The 2003 *Standards of Response Coverage Study* looked at the North Village, Reynolds Ranch, Southtown, and Lagoon Valley development projects and recommended that the City invest in, at minimum, three additional new fire stations with associated new equipment and personnel.[19] As of July 2012, the City has plans to implement these recommendations, however, these recommendations did not explicitly take into consideration more recent proposed projects and plans, such as Vanden Meadows and Brighton Landing, or full build-out of either the 1990 General Plan or the Proposed General Plan Update. Therefore, it is likely that more additional fire station(s), equipment, and personnel beyond that called for in the 2003 *Standards of Response Coverage Study* would be necessary to adequately provide fire and emergency services in Vacaville. Thus, there would be a *significant* cumulative impact.

Impact PS-CUM-1: Together with other reasonably foreseeable growth, the Specific Plan would likely require new or physically altered fire service facilities, the construction of which could cause significant environmental impacts.

> Mitigation Measure PS-CUM-1: The City shall use the development agreement process to ensure that the funding sources and mechanisms, notably impact service fees and community facilities district called for in the Draft Specific Plan, are adequate to provide for additional fire service personnel, other public safety staff, and associated equipment.
>
> Significance After Mitigation: By ensuring that the Specific Plan development pays its fair share of the additional costs of fire service personnel and equipment, the impact would be *less than significant*.

[18] City of Vacaville, 2003. *Standards of Response Coverage Study Volume 1 Final Report*, pages 24 to 25.

[19] City of Vacaville, 2003. *Standards of Response Coverage Study Volume 1 Final Report*, pages 6 and 24.

C. Schools

1. Regulatory Framework

State and local regulations, plans, and policies provide the regulatory framework for school services in the study area.

a. Senate Bill 50

SB 50, approved by the California Legislature in 1998, and funded by Proposition 1A, limits the power of Vacaville or any other city or county to require fiscal mitigation on home developers as a condition of approving new development, and provides for a standardized developer fee for schools. In 1998, SB 50 generally provided for a 50/50 State and local school facilities funding match, with a $9.2 billion bond authorized to fund the State portion. SB 50 also provided for three levels of statutory impact fees. The application level depends on whether State funding is available, whether the school district is eligible for State funding, and whether the school district meets certain additional criteria involving bonding capacity, year-round schools, and the percentage of portable classrooms in use.

California Government Code Sections 65995 to 65998 set forth provisions to implement SB 50. Specifically, according to Section 65995(3)(h), the payment of statutory fees is "deemed to be full and complete mitigation of the impacts of any legislative or adjudicative act, or both, involving, but not limited to, the planning, use, or development of real property, or any change in governmental organization or reorganization [...] on the provision of adequate school facilities." Local school districts in Vacaville are responsible for implementing the specific methods for mitigating school impacts under the Government Code.

b. Vacaville 1990 General Plan

Although schools in Vacaville are owned and operated by the school districts, and not by the City, the 1990 General Plan (existing General Plan) addresses schools in the Land Use Element and the Public Facilities, Institutions, and Utilities Element. These policies are summarized in Table 4.13-4. While Policy 2.3 – I21 indicates that development in the Specific Plan area is not per-

mitted without expansion of the Urban Service Area, this issue would be addressed as part of the General Plan Amendment[20] during the Specific Plan approval process.

2. Existing Conditions

The City of Vacaville is largely served by VUSD. There are ten elementary schools, two middle schools, and four high schools in VUSD. In addition, VUSD runs independent study programs for kindergarten through twelfth grade. The names and addresses of the VUSD schools are included in Table 4.13-4.

a. Student Enrollment and School Capacity

Current enrollment for each school for the 2011/12 school year is shown in Table 4.13-4. As shown in the table, all schools are currently operating below capacity.

VUSD tracks enrollment in special education classes separately, though there are special education programs at nearly every school. Therefore, capacity and enrollment for special education programs are listed separately in Table 4.13-4.

b. Projected Enrollment

Overall, enrollment in VUSD is projected to slightly decline over the next five years, as shown in Table 4.13-5. However, VUSD projects that enrollment will slightly increase for a few schools during this time period. These schools include Browns Valley Elementary, Cooper Elementary, Hemlock Elementary, Orchard Elementary, Vaca Peña Middle School, and Will C. Wood High School. Although enrollment is projected to minimally increase for these schools, they will still be operating below capacity.

[20] Please see Appendix B for the text of the General Plan Amendment.

TABLE 4.13-4 **1990 GENERAL PLAN POLICIES RELATED TO SCHOOLS**

Policy Number	Policy
Land Use Element	
Policy 2.2-I 10	Require new development to pay capital improvement fees for public facilities as necessary to maintain adequate resources and service levels.
Policy 2.3-I 21	In conjunction with the consideration of a Specific Plan for the property located east of Leisure Town Road and south of the Locke Paddon subdivision (within the existing Urban Service Area), a determination shall be made regarding the potential expansion of the Urban Service Area to the east in order to establish a permanent agricultural buffer on the eastern edge of the City. The City will allow no development east of Leisure Town Road until this determination is made. This will also ensure that any development and extension of urban services and infrastructure east of Leisure Town Road is not planned in a piecemeal manner.
Goal 2.5-G 7	*Ensure that new residential development shares the cost of providing services and amenities for Vacaville residents.*
Public Facilities, Institutions, and Utilities Element	
Policy 5.3-G 1	Recognize that high quality education for Vacaville's school children is a community priority.
Policy 5.3-G 2	Promote the construction of school buildings and facilities which will be a source of civic pride, visual pleasure, and community identity.
Policy 5.3-G 3	Support the principle that school children deserve to attend schools that are housed in permanent facilities and located within close proximity to their homes.
Policy 5.3-G 4	Work towards close cooperation and coordination between the City of Vacaville and the school districts.
Policy 5.3-G 6	Plan educational facilities with sufficient permanent capacity to meet the needs of current (1999) and projected future enrollment and ensure that there are mechanisms to provide for the timely construction of the facilities.
Policy 5.3-G 7	Cooperate with school districts in planning school parks as a means of meeting neighborhood recreation, child care, and open space needs.
Policy 5.3-I 2	If proposed school sites are not required or are needed in an alternate location, as determined by the school districts, the land use of the site will automatically revert to the predominant land use in the area.

TABLE 4.13-4 **1990 GENERAL PLAN POLICIES RELATED TO SCHOOLS** (CONTINUED)

Policy Number	Policy
Policy 5.3-I 3	In conjunction with the approval of residential development, cooperate with local school districts to provide sufficient school facilities to serve the enrollment generated by the new development.
Policy 5.3-I 6	Encourage school districts to promote innovative and high-quality design in school building architecture, landscaping, and campus layout.

Source: City of Vacaville, *Vacaville General Plan*, 1990.

c. Budget

California K-12 public school districts are required to have a balanced budget by June 30 of every year. As the State's budgetary crisis continues, districts throughout California have had to adopt budget-cutting measures in order to comply with that State mandate. Over the past five years, VUSD has had to cut its general operating budget from approximately $100 million to around $80 million, which is a 20 percent cut. The budget reductions approved for the 2010/2011 fiscal year totaled $8.6 million for a new budget of $77.6 million. A majority of the budget shortfalls are due to the continuing economic recession and State budgetary crisis. As the current economic climate continues, VUSD will also continue to consider a variety of budget-reducing mechanisms, including school closures, increasing class sizes, reducing and/or eliminating extra-curricular activities, additional staff layoffs, and cutting other programs and services.[21]

d. Planned Improvements[22]

VUSD currently has plans to build two new elementary schools: one in the North Village area, located north of Vaca Valley Parkway between Interstate

[21] Vacaville Unified School District, 2009. *Estimated Year-End, 2008-2009 Recommended Budget Adoption, 2009-2010 Presentation*.

[22] This section is based on the following: Coop, Leigh, Director of Facilities, Vacaville Unified School District. Personal email communication with Carey Stone, DC&E, May 21, 2010. Verified and updated via personal email communication with Melissa McDonough, The Planning Center | DC&E, February 1, 2012.

TABLE 4.13-5 **VACAVILLE UNIFIED SCHOOL DISTRICT CAPACITY 2011/12 ENROLLMENT AND PROJECTED ENROLLMENT**

					Projected Enrollment				
School	Grade	Address	Capacity	11/12 Enrollment	12/13	13/14	14/15	15/16	16/17
ACE	K-6	400 Hemlock Street	150	139	140	150	150	150	150
Alamo	K-6	500 S. Orchard Avenue	734	567	563	561	560	560	560
Browns Valley	K-6	333 Wrentham Drive	1,172	944	979	1,034	1,055	1,073	1,073
Jean Callison	K-6	6261 Vanden Road	1,027	1,027	563	561	560	1,633	1,633
Cooper	K-6	750 Christine Drive	1,056	906	882	882	882	882	882
Fairmont	K-6	1355 Marshall Road	734	580	572	572	572	572	572
Hemlock	K-6	400 Hemlock Street	469	270	430	446	442	450	450
Edwin Markham	K-6	101 Markham Avenue	1,083	772	838	836	839	836	836
Orchard	K-6	805 North Orchard Avenue	499	393	383	388	394	394	394
Padan	K-6	200 Padan School Road	940	643	657	660	646	660	660
Independent Study	K-6	Various	28	28	28	28	28	28	28
Willis Jepson Middle School	7-8	580 Elder Street	1,164	925	897	922	950	998	998
Vaca Peña Middle School	7-8	200 Keith Way	1,107	852	943	935	923	920	921
Independent Study	7-8	Various	38	25	45	45	46	47	47
Buckingham Charter School	9-12	188-B Bella Vista Road	432	460	460	460	460	460	460
Country High School	9-12	100 McClellan Street	135	165	121	119	125	123	123
Vacaville High School	9-12	100 West Monte Vista Avenue	2,133	1,860	1,921	1,855	1,842	1,827	1,827
Will C. Wood High School	9-12	998 Marshall Road	1,998	1,487	1,492	1,494	1,685	1,634	1,634
Independent Study Program	9-12	188-A Bella Vista Road	306	239	285	280	295	290	290

TABLE 4.13-5 **VACAVILLE UNIFIED SCHOOL DISTRICT CAPACITY 2011/12 ENROLLMENT AND PROJECTED ENROLLMENT** (CONTINUED)

				Projected Enrollment					
School	Grade	Address	Capacity	11/12 Enrollment	12/13	13/14	14/15	15/16	16/17
Special Education	K-6	Various	240	141	140	140	142	143	144
Special Education	7-8	Various	48	58	45	46	46	47	48
Special Education	9-12	Various	120	105	107	109	107	112	111

Source: Coop, Leigh. Director of Facilities, Vacaville Unified School District. Personal email communication with Melissa McDonough, The Planning Center | DC&E, February 1, 2012.

505 and Leisure Town Road, and the other in the Rice-McMurty area, located north of Vaca Valley Parkway, east of Browns Valley Road. Both proposed elementary schools are in the early planning stages, and there are no current plans for construction. VUSD will not build an elementary school until there is a guaranteed enrollment of 400 students, due to the costs associated with school operations.

VUSD does not currently own the land for the North Village site. However, the developer of the proposed North Village residential subdivision recently submitted plans to VUSD for a new residential development, including a proposed school site. VUSD is currently reviewing the plan and beginning its due diligence, which includes obtaining approval from the California Department of Education for a new school site, and negotiating a purchase agreement with the developer.

VUSD has purchased two parcels totaling approximately 20 acres for the Rice-McMurty future elementary school site. At this time, there are no plans for this school site.

In addition to the two future school sites, VUSD has nearly completed a major renovation and new construction facilities program. This program was largely funded by Measure V, a voter-approved general obligation bond passed in November 2001, which generated $101.3 million for school funding. In addition, VUSD leveraged Measure V money with the State School Facilities Program and developer fees for a total of $150 million for school renovations, additions, and replacements. Every school campus except Buckingham Charter Magnet High School has received major renovation improvements as well as new additions and technology upgrades. Major new construction includes a new classroom wing at Alamo Elementary School, a new Science Building at Will C. Wood High School, and a new gymnasium at Vaca Peña Middle School. The most recent new construction project was the complete replacement of the Fairmount Charter Elementary School with a LEED Silver- and Collaborative for High Performance Schools (CHPS)-certified green school at the same site.

As of Fall 2011, the Measure V program is nearly complete. The final major renovation project is the modernization of Will C. Wood High School, which is currently underway and scheduled to be completed by late Fall 2012. In June and August 2010, VUSD received $7.7 million from the State, which allowed the project to go forward, starting spring 2011.

There are additional renovation and construction projects outlined in VUSD's Draft *Long-Range Facilities Master Plan*, which had not been approved as of January 2012. In total, the Draft Master Plan estimates these projects will cost over $200 million. The projects include replacing all portable buildings with permanent structures, updating technology, and replacing outdated facilities, including multi-purpose rooms, gymnasiums, libraries, school offices, and cafeterias. However, there is no funding in place for these projects. Once the Master Plan is approved, the School Board may explore the option of attempting to pass another bond measure.

Additional funding for school improvement projects comes from developer impact fees. As of January 2012, VUSD charges $2.05 per square foot for new residential construction. For commercial and senior-restricted residential development, the developer impact fee is $0.33 per square foot.

3. Standards of Significance

The Specific Plan would have a significant impact with regard to schools if it would result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for 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.

4. Project Impacts

According to VUSD, at buildout, the Specific Plan's 769 residential units would generate a total of 423 additional students:[23]

- 215 K-6 students
- 85 7th and 8th grade students
- 123 9th to 12th grade students

These additional students would require the following new school facilities:

- One third of a new elementary school
- Expansion of or improvements to an existing middle school
- New high school facilities, such as classrooms

The Specific Plan proposes to include a new public school site serving elementary and middle school students. This would expand VUSD's capacity and address the school service needs of the elementary and middle school students generated at Specific Plan buildout. However, it is likely that many of the 123 high school students generated by Specific Plan development would choose to attend a VUSD public high school rather than the private Catholic high school included in the Specific Plan. Therefore, buildout of the Specific Plan would contribute to the need for expansion of and improvements to existing high school facilities and/or construction of new high school facilities.

Senate Bill 50 requires that developers involved with buildout of the Specific Plan pay a standardized development fee toward schools. School impact fees could be used to expand existing high school facilities as buildout occurs. It is not known at this point when such facilities would be required or what the exact nature of these facilities would be. As a result, it cannot be determined what project-specific environmental impacts would occur from their construction and operation. The potential impacts would be identified during the facility planning process. However, any future construction required due

[23] Coop, Leigh, Director of Facilities, Vacaville Unified School District. Personal email communication with Melissa McDonough, The Planning Center | DC&E, February 1, 2012.

to Specific Plan-generated students would be subject to project-level CEQA review and required to follow State school siting guidelines as specified in California Government Code Section 33050. In accordance with California Government Code Section 65997, payment of required school impact fees is must be deemed an adequate mitigation measure for the purposes of CEQA. Therefore there would be a *less-than-significant* impact resulting from construction of new high school facilities.

5. Cumulative Impacts

Like the Brighton Landing Specific Plan, other development in Vacaville as part of approved projects or the 1990 General Plan would be required to pay state-mandated school impact fees to VUSD. Payment of these impact fees is considered adequate mitigation under CEQA. Therefore, cumulative impacts to school services would be *less than significant*.

In terms of cumulative school construction impacts, each new school would be subject to project-level CEQA review and required to follow State school siting guidelines as specified in California Government Code 33050. Therefore cumulative impacts from construction of new schools would be *less than significant*.

During the Proposed General Plan Update, VUSD is analyzing future school facility needs for the area east of Leisure Town Road. This area is being considered as a new growth area in the Preferred Land Use Alternative and as such would experience additional population, housing, and associated student generation. However, the VUSD's school facility analysis includes planning for and constructing new schools to accommodate this growth.[24]

[24] Coop, Leigh, Director of Facilities, Vacaville Unified School District. Personal email communication with Melissa McDonough, The Planning Center | DC&E, February 1, 2012.

D. Libraries

1. Regulatory Framework

The 2001 Solano County Libraries Facility Master Plan (FMP) establishes service standards and identifies improvement projects for the County library system. Table 4.13-6 identifies recommended service levels for the year 2020.

TABLE 4.13-6 **SOLANO COUNTY LIBRARY RECOMMENDED SERVICE LEVELS**

Service	Recommended 2020 Service Level
Collection	2.5 volumes per Solano County resident
Seating	3.1 seats per 1,000 Solano County residents
Computers/Training Lab	1.3 computers per 1,000 Solano County residents
Storytelling	1 seat per 1,000 Solano County residents
Community Room	3 seats per 1,000 Solano County residents
Group Study/Tutoring	0.7 seats per 1,000 Solano County residents
Building Size	0.76 square feet per Solano County resident

Source: *2001 Solano County Library Facilities Master Plan*, page 26.

In 2009, the FMP was updated to reflect achievements since 2001 and to identify continued needs.

Additionally, Solano County collects Public Facilities Fees—including a Library Impact Fee.[25] The Public Facilities Fees would be assessed on each house constructed in the Specific Plan area as during the building permit process. The public school would be exempt, but the private school would be non-exempt from the Public Facilities Fees.

[25] Bugbee, Virginia. Permit Technician, Building and Safety, Solano County. Personal communication with Melissa McDonough, The Planning Center | DC&E, May 3, 2012.

2. Existing Conditions

The Solano County Library System governs and administers the Vacaville Public Libraries. The Library District contracts for service with the Solano County Library System to provide administration and technical support, including cataloguing and material acquisition.[26]

Two libraries serve Vacaville residents: the Town Square Branch Library, located at 1 Town Square Place, and the Cultural Center Branch Library, located at 1020 Ulatis Drive. Each library has a collection of books, magazines, CDs, and DVDs for all age groups. There are also library programs targeted for a variety of ages, including story time for children and a literacy program for adults. Both libraries are part of the Solano, Napa, and Partners (SNAP) library system, which serves the residents of Napa and Solano Counties by providing library patrons with access to information and publications through its 13 member libraries.

3. Standards of Significance

The Specific Plan would have a significant impact with regard to libraries if it would result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for 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.

4. Project Impacts

If typical of other Vacaville residents, the approximately 2,107 new residents associated with Specific Plan buildout would not adversely affect the provision of adequate library services.[27] It is expected that students attending the proposed public school would have access to Vacaville Unified School Dis-

[26] Stevens, Jan, Library Branch Manager, Solano County Library. Personal email communication with Carey Stone, DC&E, April 19, 2010.

[27] Katz, Bonnie, Director of Library Services, Solano County Library. Personal email communication with Melissa McDonough, The Planning Center | DC&E, January 18, 2012.

trict libraries and that the private high school would maintain its own library. Also, by paying the County's Public Impact Fees, the project would satisfy the County's requirements, which would be considered adequate mitigation under CEQA. Therefore there would be *a less-than-significant* impact.

5. Cumulative Impacts

Future growth, whether from approved plans, or build-out of either the 1990 General Plan or the Proposed General Plan Update, together with build-out of Brighton Landing may bring enough additional residents to Vacaville to require provision of a new, expanded, or renovated library and additional staff, thus resulting in a *significant* cumulative impact.

Impact PS-CUM-2: Future growth, whether from approved plans, or build-out of either the 1990 General Plan or the Proposed General Plan Update, together with build-out of Brighton Landing, may bring enough additional residents to Vacaville to require provision of a new, expanded, or renovated library and additional staff.

Mitigation Measure PS-CUM-2: It is not known at this point when such facilities would be required or what the exact nature of these facilities would be. As a result, it cannot be determined what project-specific environmental impacts would occur from their construction and operation and how exactly to mitigate those impacts. The potential impacts would be identified during the facility planning process. However, by paying the County's Public Impact Fees, the Project would satisfy the County's financial requirements, which would be considered adequate mitigation for its contribution to the cumulative impact.

Significance After Mitigation: After mitigation, the Project's contribution to cumulative impacts would be *less than significant*.

E. Parks and Recreation

1. Regulatory Framework

a. Regional Agencies, Plans, and Policies

This section describes the regional agencies, plans, and policies that pertain to parks and recreation in Vacaville.

i. Solano County

The Solano County Parks Administration and Planning Department is responsible for planning and operating parks within Solano County. The Solano County General Plan Park and Recreation Element includes plans for future parks within the county; no new parks are planned within Vacaville. Lake Solano, located approximately 11 miles northwest of Vacaville, is the closest County park.

ii. Solano County Resource Conservation and Open Space Plan

The County's Resource Conservation and Open Space Plan was last amended in 1999. The document includes general goals, policies, and plans for open space within the county, as well as resource management and resource conservation strategies. The Plan identifies open spaces within Vacaville, including areas under Vacaville's jurisdiction such as the Lagoon Valley Park.

iii. Solano Tranportation Authority (STA) Bicycle and Pedestrian Plans

The STA's 2012 Bicycle and 2004 Pedestrian Transportation Plans are documents providing a vision for bikeways and pedestrian pathways countywide. Besides identifying goals and policies supportive of bicycle and pedestrian uses, these two countywide plans also tie in to local plans, including some in Vacaville.

iv. Solano Land Trust

The Solano Land Trust is a nonprofit organization that preserves agricultural lands, open spaces, and resources in Solano County. The organization accomplishes these goals through education, land management, and acquiring land and conservation easements. The organization was previously named

the Solano County Farmlands and Open Space Foundation.[28] The Trust does not own any open space areas within the Vacaville study area. However, they own 11 acres directly south of Lagoon Valley directly adjacent to City-owned open space.

b. Local Plans

The Vacaville 1990 General Plan and the 1992 Vacaville Comprehensive Parks, Recreation, and Open Space Master Plan provide policy guidance for parks and recreation facilities in Vacaville.

i. Vacaville 1990 General Plan

The 1990 General Plan (existing General Plan) contains a Parks and Recreation Element, which is an optional element under State law. Policies in the 1990 General Plan relating to parks and recreation are listed in Table 4.13-7.

ii. Comprehensive Parks, Recreation, and Open Space Master Plan

Vacaville's Comprehensive Parks, Recreation, and Open Space Master Plan was developed in 1992 to guide the development of parks, recreation, and open space facilities throughout the city. The Master Plan describes the existing conditions of parks and recreation facilities throughout the city, proposes new facilities, and includes policies to implement the Master Plan. The Master Plan establishes service standards for parks and specific recreation facilities, and includes policies to distribute these amenities evenly throughout the city. Additional discussion addresses use and development of open space lands.

iii. Vacaville Municipal Code

Vacaville currently requires a Parks and Recreation Impact Fee for new development. This fee is included and described under Section 11.01.020 of the Municipal Code. The fee intends to provide for the adequate provision of

[28] Nicole Byrd, Executive Director, Solano Land Trust. Personal communication with Will Fourt, DC&E, June 4, 2010.

TABLE 4.13-7 **1990 GENERAL PLAN POLICIES RELEVANT TO PARKS AND RECREATION**

Policy No.	Policies
Land Use Element	
Policy 2.2-I 8	Maintain and refine the Planned Growth Ordinance and allow urban development only in accord with this plan for full urban services (police, fire, parks, water, sewer, streets, and storm drainage). Areas lacking full services are deemed March 2008 Land Use Element Chapter 2 Page 12 outside the urban-service area, are unsuited for urban development regardless of Plan designation until services are assured and shall not be identified in a phasing plan.
Policy 2.2- I 10	Require new development to pay capital improvement fees for public facilities as necessary to maintain adequate resources and service levels. Adequate public facilities should be provided for new urban development, and new developments should bear their "fair share" cost of providing such facilities. In order to make reasonable provision for these new public facilities, the City of Vacaville has established public facilities fees which are applied to all new development. The fees are intended to provide for facilities that are required in addition to the normal onsite and offsite development improvements. Such fees are established to implement the policy of the General Plan and may include charges for connection to the water system, connection to the sanitary sewer system, parkland and improvements, school facilities, drainage improvements, and other capital improvements such as streets, bridges, traffic signals, and public buildings. The City Council may enact other public facilities fees if it finds that such fees are required to implement the policy of the General Plan.
Policy 2.5-G 7	Ensure that new residential development shares the cost of providing services and amenities for Vacaville residents.
Policy 2.5-I 10	Require impact fees from developers, as appropriate and necessary, for provision of community facilities and services. Maintain the existing policy that development "must pay its own way."
Policy 2.6-G 5	Provide sufficient space to meet the need for commercial services and commercial recreation that can be supported by Vacaville's residents, businesses, and private workers. (See also Parks and Recreation Element policy 4.6-G6).

TABLE 4.13-7 **1990 GENERAL PLAN POLICIES RELEVANT TO PARKS AND RECREATION** (CONTINUED)

Policy No.	Policies
Parks and Recreation Element	
Policy 4.6-G 1	Develop a high-quality public park system that provides varied recreational opportunities accessible to all City residents.
Policy 4.6-G 2	Provide parks that reflect and respect Vacaville's natural setting.
Policy 4.6-G 3	Recognize the role that parks play in preserving natural features and establishing urban limits.
Policy 4.6-G 4	Establish standards for the provision of public parks to ensure adequate distribution, size, and service area.
Policy 4.6-G 5	Support the use of park facilities by persons working but not residing in Vacaville.
Policy 4.6-G 6	Encourage development of private and commercial recreational facilities at appropriate locations. Substitution of private recreational facilities for public parks is discouraged in order to ensure access to outdoor recreation by all sectors of the population.
Policy 4.6-G 7	Distribute public parks and recreational facilities throughout the urban service zone according to service area standards specified in this Element.
Policy 4.6-G 8	Evaluate the impact of proposed urban development on open space lands in terms of recreational opportunities and consider means of protecting these lands.
Policy 4.6-G 9	Make provisions for handicapped individuals to freely participate in all aspects of community life including recreational activities. Guidelines to be used in providing access for the handicapped shall conform to local, State and federal codes. Parks and recreational facilities shall be designed and built to meet the needs of the handicapped population.
Policy 4.6-G 10	Establish policies to prevent the degradation or despoilment of the City's parklands through inappropriate uses.
Policy 4.6-G 11	Provide neighborhood parks to serve the special recreational, cultural, and educational needs of different neighborhoods.
Policy 4.6-G 12	Locate new neighborhood parks adjacent to new elementary schools where possible.
Policy 4.6-G 13	Provide community parks encompassing a range of uses including active high investment (gymnasiums, swimming pools, etc.), active low-investment (playfields, etc.) and passive recreational facilities. Community parks shall contain facilities to serve the entire City or large portions of the City by providing recreational and cultural activities beyond those supplied by neighborhood parks.

TABLE 4.13-7 **1990 GENERAL PLAN POLICIES RELEVANT TO PARKS AND RECREATION** (CONTINUED)

Policy No.	Policies
Policy 4.6-G 14	Plan park and recreational facilities in cooperation with concerned public and private agencies and organizations.
Policy 4.6-G 15	Solicit the views of the public in planning park and recreation facilities.
Policy 4.6-G 16	Provide a City Park with access to all facilities that is designed to serve as a community centerpiece.
Policy 4.6-I 1	Maintain a Public Parks Distribution Standard of 4.5 acres of park for every 1,000 residents with 1.8 acres/1,000 residents of neighborhood park, 1.7 acres/1,000 residents of community park, and 1.0 acres/1,000 residents of city park.
Policy 4.6-I 2	Establish typical size and service area standards for neighborhood, community, and city parks as follows: ¨ Neighborhood Parks – 6 to 9 acres; 0.5-mile service area. ¨ Community Parks - 10 to 40 acres; 1- to 2-mile service area. ¨ City Parks - 100 acres or more; centrally sited to serve all areas of the city.
Policy 4.6-I 3	Cooperate with special districts, the County, and the State to ensure that the needs of Vacaville residents for regional parks are met.
Policy 4.6-I 4	Implement the Comprehensive Parks, Recreation, and Open Space Master Plan, consisting of the following elements: ¨ Standards for all park classifications and guidelines for public open space. ¨ An assessment of existing and future parks, recreation and open space needs, including a review of opportunities to link the City's facilities with those of neighboring jurisdictions. ¨ Development of an action plan to provide for sites, funding and facilities to meet the City's needs. ¨ A schedule for acquisition, development, and maintenance of facilities. ¨ An Action Plan for the Community Services Department.
Policy 4.6-I 6	Develop the Trails and Trailhead system as shown in the Comprehensive Parks, Recreation and Open Space Master Plan. These trails provide access to and linkage of recreation sites and facilities, provide an alternative circulation system where more feasible and appropriate, and complement and tie in with the City's bikeways system.
Policy 4.6-I 7	Promote the environmental and recreational qualities of Lagoon Valley Regional Park.

TABLE 4.13-7 **1990 GENERAL PLAN POLICIES RELEVANT TO PARKS AND RECREATION** (CONTINUED)

Policy No.	Policies
Policy 4.6-I 8	Preserve and enhance available riparian corridors, wildlife habitat, oak woodland, and other biotic resources within parks.
Policy 4.6-I 9	Require developers of moderate and high density projects that do not contain standard yards to incorporate private recreation areas into subdivisions and to create homeowners associations or similar mechanisms for developing, supervising, and maintaining such areas. These recreation areas are in addition to the public parks paid for by building or other fees. All other parks and recreation facilities required by this Plan shall be publicly owned, operated, and maintained and shall be funded, at least in part, by fees paid by new development.
Policy 4.6-I 10	Require all residential developers, including apartment builders, to provide public park and recreation facilities either by paying Park Development Impact Fees and/or dedicating sites in lieu of Park Development Impact Fees.
Policy 4.6-I 11	Encourage the dedication of landscaped and developed parks, trail sections and special requirements where these meet the standards established by the Parks and Recreation Facilities Master Plan.
Policy 4.6-I 12	Cooperate with the school districts in developing standards for Neighborhood Schools Parks that ensure diversity, quality and innovation in design.
Policy 4.6-I 13	Locate parks and recreation facilities in relation to components of the Trails System, buffers, urban separators, and natural features. Wherever possible, site new parks in locations that encourage pedestrian access and that do not require that users cross arterials.
Policy 4.6-I 15	Use existing and new well sites, and other public lands, where feasible, for recreation or community gardens.
Policy 4.6-I 16	Review proposals for private recreation facilities for consistency with Plan policies and standards.
Policy 4.6-I 17	Implement Parks and Recreation Master Plan standards and policies for the City Park.
Policy 4.6-I 18	Coordinate all proposals for recreational facilities within the City Park as part of an overall landscape design under the Parks, Recreation and Open Space Master Plan.
Policy 4.6-I 19	Encourage private recreation facilities to locate east of Leisure Town in Agricultural Buffer areas when they are consistent with the underlying use.

TABLE 4.13-7 **1990 GENERAL PLAN POLICIES RELEVANT TO PARKS AND RECREATION** (CONTINUED)

Policy No.	Policies
Public Facilities, Institutions and Utilities Element	
Policy 5.3-G 7	Cooperate with school districts in planning school parks as a means of meeting neighborhood recreation, child care, and open space needs.

Source: City of Vacaville, 1990. *Vacaville General Plan*.

parks, recreation facilities and park improvements such as tennis courts, swimming pools, and soccer and ball fields as Vacaville's population grows.

c. Park Service Standards

The City of Vacaville has park service standards for the provision of neighborhood, community, and city parks based on a ratio of 4.5 acres of developed parkland per 1,000 Vacaville residents. This is further broken down by park type—specifically, 1 acre City, 1.7 acres Community, and 1.8 acres Neighborhood parkland per each 1,000 Vacaville residents.[29] The City is currently deficient in meeting its park service standards.[30]

In practice, an applicant might propose to meet these standards through setting aside land for new parks and constructing those parks, and/or paying development impact fees to fund the acquisition and development of new parkland.

d. Facility Service Standards

As part of the 1992 *Comprehensive Parks, Recreation and Open Space Master Plan* the City of Vacaville identified current level of service ratios and developed recommend level of service ratios for recreation facilities. These ratios

[29] Hesterman, Hewett, Park Planner, City of Vacaville. Personal email communication with Melissa McDonough, The Planning Center | DC&E, January 5, 2012.

[30] The Planning Center | DC&E, 2010. *Parks and Recreation in Vacaville Technical Memorandum*, page 14.

are described in Table 4.13-8 below. Currently, the City meets two of its standard of service ratios for facilities: Baseball/Softball Fields and Swimming Pool.

2. Existing Conditions

The City's inventory of parks and recreation facilities ranges from small ½-acre bicycle rests to traditional neighborhood ball fields to large tracts of undeveloped open land. Park facilities are classified into three categories: neighborhood parks, community parks, and city parks. Recreational facilities span the gamut from soccer fields to community centers.

a. Parks

The City of Vacaville owns and operates three categories of parks: neighborhood, community, and city parks. The following section defines each park category, as stated in the City's 1990 General Plan.

i. Neighborhood Parks

Neighborhood parks primarily serve the recreation needs of individual neighborhoods or a small portion of the city. The location serves the residential area within a ½-mile of the park. Park facilities are usually oriented towards the recreation needs of children and include multi-purpose fields, playgrounds, recreation centers (at certain school/parks), and tot lots. Three of the 28 neighborhood parks (described in Table 4.13-9) in Vacaville are within a half mile of the Specific Plan area, but are located across Leisure Town Road, an arterial street.[31]

ii. Community Parks

Community parks are designed to generally serve a portion of the city's population living within a one to one-and-a-half mile service radius. Community parks provide facilities such as lighted ball fields, swimming pools, and areas and buildings for community festivals and civic events as well as for organized sports and athletic competitions. While community parks serve larger areas

[31] The Planning Center | DC&E, 2010. Parks and Recreation in Vacaville Technical Memorandum.

TABLE 4.13-8 **RECREATIONAL FACILITIES LEVEL OF SERVICE STANDARDS**

	2010 Number of Facilities	2010 Level of Service Ratio[a]	Recommended Level of Service Ratio[b]
Baseball/Softball Fields	44	1/2,101	1/2,750
Basketball Courts	15.5	1/5,963	1/5,000
Community Centers	2	1/ 46,214	1/32,000
Football/Soccer	12	1/ 7,702	1/4,000
Gymnasium	1.3	1/ 71,098	1/32,000
Neighborhood Centers	2	1/ 46,214	1/13,000
Senior Centers	1	1/ 92,428	1/64,000
Swimming Pool	3	1/ 30,809	1/32,000
Tennis Courts	17	1/ 5,437	1/5,000
Volleyball Courts	2	1/ 46,214	1/10,000

[a,b] Level of service is described as a ratio of one facility per number of residents. Only public facilities were included. The 2010 Level of Service was calculated by dividing the 2010 U.S. Census population for Vacaville (92,428) by the 2010 Number of Facilities.
Sources: City of Vacaville, 1990. *Comprehensive Parks, Recreation and Open Space Master Plan*, page 101; The Planning Center | DC&E, 2010. *Parks and Recreation in Vacaville Technical Memorandum*; Hesterman, Hewett, Park Planner, City of Vacaville. Personal email communication with Melissa McDonough, The Planning Center | DC&E, January 18, 2012.

of the city than neighborhood parks, a community park can also function as a neighborhood park for the area in which it is located. There are eight existing community parks in Vacaville.[32] Within 1½ miles of the Specific Plan area there is one existing community park (Nelson Park) and two planned

[32] Hesterman, Hewett, Park Planner, City of Vacaville. Personal email communication with Melissa McDonough, The Planning Center | DC&E, January 18, 2012.

TABLE 4.13-9 **NEIGHBORHOOD PARKS WITHIN ½-MILE OF SPECIFIC PLAN AREA**

ID	Name	Location	Acres
3	Arbor Oaks Park	Arbor Oaks Drive @ Leeward Court	2.5
21	Patwin Park	Elmira & Leisure Town Road	4.7
23	Pocket Park	Elmira Road (East of Ralph Avenue)	1.0

Source: The Planning Center | DC&E, 2010. *Parks and Recreation in Vacaville Technical Memorandum*.

additions (the proposed Elmira - Leisure Town Park and the development of six vacant acres at Nelson Park.

iii. City Parks

City parks are 100 acres or more in size and are designed to serve the entire city population as a community centerpiece and outdoor recreational space. The location of a city park should be centrally located to serve all areas of the city. A city park may include such facilities as a golf course, playfields, a swimming complex, or a gymnasium. It may also include large, natural open space areas for low-intensity or passive recreational use.

Centennial Park is Vacaville's only park classified as a city park. Currently approximately one-third of the park is developed. Located centrally within the city, it is accessible to all residents. Currently approximately 36 of the park's 265 total acres are developed. Its existing facilities include one pony league field, three little league fields, four Vacaville Youth Soccer League soccer fields, one wiffle ball field, one outdoor roller hockey court (marked on a parking area), four tennis courts, hiking trails, on-site parking for approximately 1,673 vehicles, restrooms, and a concession complex.

b. Facilities

Recreational facilities in Vacaville include both community and neighborhood centers, as well as baseball/softball fields, volleyball courts, basketball

courts, football/soccer, swimming pool, gymnasium, and tennis courts. In addition to recreational programming, community centers are intended to house a wide range of public events, from seminars to craft fairs. Neighborhood centers house the after-school recreational programming and are also used for drop-in recreation. The number of the different types of facilities in Vacaville is described in Table 4.13-8.

3. Standards of Significance

The Specific Plan would have a significant impact with regard to parks and recreation if it would:

a. Result in substantial adverse physical impacts associated with the provision of new or physically altered parks, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives.

b. Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.

c. Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

4. Project Impacts

The Specific Plan would have a significant environmental impact if it would either require the provision of new or altered parks and recreational facilities, or accelerate physical deterioration of neighborhood and regional parks. Such impacts could result from a substantial increase in population or significant development of open space.

a. Result in substantial adverse physical impacts associated with the provision of new or physically altered parks, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives

As described earlier, Vacaville has a standard of providing 4.5 acres of parkland (i.e. 1-acre City parkland, 1.7 acres Community parkland, and 1.8 acres Neighborhood parkland) per 1,000 residents; however, the standard is currently not being met city-wide. A new residential development may be required to either dedicate new parkland, and/or pay park development impact fees. In this case, the Specific Plan would bring 2,107 new residents to the area; therefore, because this number of new residents cannot be accommodated by the existing neighborhood within the ½-mile service area, the Specific Plan has included six acres for a new Neighborhood Park.[33,34]

The increase in residential population associated with buildout of the Specific Plan would require the provision of additional parkland as detailed in Table 4.13-10. The Specific Plan exceeds the standard for Neighborhood Park acreage required of a development of its size, but does not provide any land for new Community or City park facilities. The applicant would be required to pay the City's Park and Recreation Development Impact fees for the parkland not included in the Specific Plan area. By paying the City's adopted park impact fees, the project would satisfy the City's requirements. Therefore, payment of adopted park impact fees is considered adequate mitigation under CEQA, and the impact would be *less than significant*.

b. Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated

There are two parks near the Proposed Project, Patwin Park and Arbor Oaks Park. These two parks are likely to experience increased use from new residents associated with the Proposed Project. The use of these two parks by Brighton Landing residents would likely continue to increase as buildout of the Proposed Project occurs over time, until such time as the Neighborhood Park component of the Proposed Project is constructed. The use of these two parks by Brighton Landing residents would likely continue to increase as

[33] The new resident estimate assumes 2.74 persons per household.

[34] Hesterman, Hewett. Park Planner, City of Vacaville. Personal communication with Melissa McDonough, The Planning Center| DC&E. January 5, 2012.

TABLE 4.13-10 **NEW REQUIRED PARKLAND**

	Acreage Required to Meet Level of Service Standard	Acreage Provided in Specific Plan
City Park	2.1	–
Community Park	3.6	–
Neighborhood Park	3.8	6

Notes: Acreage was calculated by multiplying the projected number of persons (i.e. 2,107, assuming 2.74 persons per household) by the required acreage percentage of each park type. For example, 1 acre of City park per 1,000 persons is equivalent to .0010 and .0010 x 2,384 = 2.38.
Source: Hesterman, Hewett. Park Planner, City of Vacaville. Personal communication with Melissa McDonough, The Planning Center| DC&E. January 5, 2012.

buildout of the Proposed Project occurs over time, until such time as the Neighborhood Park component of the Proposed Project is constructed. However, since the increased use is gradual and temporary and would not likely cause or accelerate substantial physical deterioration, this would be a *less-than-significant* impact.

While parks are often frequented primarily by nearby residents, recreational facilities can be a citywide draw. Currently, in the City of Vacaville, only two types of recreational facilities are meeting the recommended level of service ratio—swimming pools and baseball/softball fields, as demonstrated in Table 4.13-8. Future residents of the proposed project would increase the use of recreational facilities citywide. However, the increased use would be gradual and would not likely cause or accelerate substantial physical deterioration of the facilities. Also, the proposed project would have a projected population of 2,107, while the lowest facility threshold, shown in Table 4.13-8, is triggered at 2,750 residents. Therefore the Specific Plan would not require the construction of any new facilities, and impacts would be *less than significant*.

5. Cumulative Impacts

Because there is an existing deficit of developed parkland in Vacaville, it is likely that population growth associated with approved projects or buildout of either the 1990 General Plan or the Proposed General Plan Update, together with build-out from Brighton Landing would require provision of new parks and facilities and/or contribute to the deterioration of existing parks and facilities. Therefore, there would be a *significant* impact, although the Project does not contribute to this impact after mitigation due to its provision of parkland and impact fees.

Impact PS-CUM-3: Cumulatively, the increase in population associated with new and proposed projects and plans in Vacaville would be likely to require construction of new parks and facilities or contribute to existing park and facility deterioration. This is a *significant* impact.

Mitigation Measure PS-CUM-3: It is not known at this point when such new or expanded parks and facilities would be required or what the exact nature of these facilities would be. As a result, it cannot be determined what project-specific environmental impacts would occur from their construction and operation. Potential impacts would be identified during the facility planning process. However, the City shall use the development agreement process to ensure that the funding sources and mechanisms, notably impact service fees and community facilities district called for in the Draft Specific Plan, are adequate to provide for new or expanded additional parks and facilities.

Significance After Mitigation: Brighton Landing would no longer contribute to this impact after mitigation. After mitigation, the Project's contribution to cumulative impacts would be *less than significant*.

4.14 TRAFFIC AND TRANSPORTATION

This section describes the regulatory framework and existing conditions in the project area related to traffic and transportation, and the potential impacts of the project on the transportation system.

A. Regulatory Framework

Existing transportation policies, plans, laws and regulations that apply to the proposed project are summarized below. This information provides a context for the impact discussion related to the project's consistency with applicable regulatory conditions.

1. Federal Regulations and Policies

This section summarizes federal agencies and laws pertinent to the proposed project.

a. Americans with Disabilities Act

The Americans with Disabilities Act (ADA) provides comprehensive rights and protections to individuals with disabilities. The goal of the ADA is to assure equality of opportunity, full participation, independent living, and economic self-sufficiency. To implement this goal, the United States Access Board has created accessibility guidelines for public rights-of-way. The guidelines address various issues, including roadway design practices, slope and terrain issues, pedestrian access to streets, sidewalks, curb ramps, street furnishings, pedestrian signals, parking, and other components of public rights-of-way. The guidelines would apply to proposed roadways in the project area.

2. State Agencies, Regulations, and Policies

This section summarizes State agencies, regulations, and policies that pertain to transportation in Vacaville.

a. California Department of Transportation

The California Department of Transportation (Caltrans) is the primary State agency responsible for transportation issues. One of its duties is the construc-

tion and maintenance of the State highway system. Caltrans has established standards for roadway traffic flow and developed procedures to determine if State-controlled facilities require improvements. For projects that may physically affect facilities under its administration, Caltrans requires encroachment permits before any construction work may be undertaken. For projects that would not physically affect facilities, but may influence traffic flow and levels of services at such facilities, Caltrans may recommend measures to mitigate the traffic impacts of such projects. Caltrans facilities within the Vacaville study area include Interstate 80 and Interstate 505, as well as the on- and off-ramps from these State facilities.

The following Caltrans procedures and directives are relevant to the project:

- Level of Service Target. Caltrans maintains a minimum level of service (LOS) at the transition between LOS C and LOS D for all of its facilities.[1] Where an existing facility is operating at less than the LOS C/D threshold, the existing measure of effectiveness should be maintained.[2]

- Environmental Assessment Review and Comment. Caltrans, as a responsible agency under the California Environmental Quality Act (CEQA), is available for early consultation on projects to provide guidance on applicable transportation analysis methodologies or other transportation related issues, and is responsible for reviewing traffic impact studies for errors and omissions pertaining to the State highway facilities. In relation to this role, Caltrans published the Guide for the Preparation of Traffic Impact Studies (December 2002), which establishes the Measures of Effectiveness as described under "Level of Service Target" above. The Measures of Effectiveness are used to determine significant impacts on State facilities. The Guide also mandates that traffic analyses include mitigation measures to lessen potential project impacts on State facilities and to meet each project's fair share responsibility for the impacts. However, the ultimate mitigation measures and their implementa-

[1] Level of service is explained further in Section A.1.c.

[2] California Department of Transportation, 2002. *Guide for the Preparation of Traffic Impact Studies.*

tions are to be determined based on consultation between Caltrans, the City of Vacaville, and the project proponent.

3. Regional Agencies, Plans, and Policies

This section summarizes regional agencies, plans, and policies that pertain to transportation in Vacaville.

a. Metropolitan Transportation Commission

The Metropolitan Transportation Commission (MTC) is the transportation planning, coordinating, and financing agency for the nine-county Bay Area, including Solano County. It also functions as the federally mandated metropolitan planning organization (MPO) for the region. MTC authored the current regional transportation plan known as *Transportation 2035* that was adopted on April 22, 2009. *Transportation 2035* specifies a detailed set of investments and strategies throughout the region from 2010 through 2035 to maintain, manage, and improve the surface transportation system, specifying how anticipated federal, State, and local transportation funds will be spent. The projects included in the 2035 Plan that will most directly affect the proposed project are:

- Construction of a new Fairfield/Vacaville Multi-Modal Train Station at the southeast corner of Peabody Road and Vanden Road in northeast Fairfield for Capitol Corridor intercity rail service.
- Construction of Jepson Parkway from Route 12 to Interstate 80 at the Leisure Town Road Interchange. In Vacaville, Jepson Parkway will follow the Leisure Town Road alignment along the western border of the Brighton Landing Specific Plan area.

b. Solano Transportation Authority

The Solano Transportation Authority (STA) has been designated as the Congestion Management Agency to address congestion issues in Solano County and the seven cities within the county, including Vacaville. It is responsible for countywide transportation planning, programming transportation funds, managing and providing transportation programs and services, delivering transportation projects, and setting transportation priorities. The STA Board

of Directors adopted the Solano County Comprehensive Transportation Plan (CTP 2030)[3] in June 2005. The Plan envisions, directs, and prioritizes the transportation needs of Solano County through 2030.

As the designated Congestion Management Agency, STA worked with jurisdictions within the county, including Vacaville, to identify locations where periodic congestion monitoring would occur as required by the State's CMP legislation. Level of service standards are established for segments of the CMP roadway system that connect communities with each other and with the State highway system.

4. Local Policies and Regulations

This section summarizes City policies and regulations that pertain to transportation in Vacaville.

a. Vacaville General Plan

The City of Vacaville's General Plan contains guiding and implementing policies that are relevant to transportation and circulation in the study area. These guiding and implementing policies are presented in Table 4.14-1. The City is currently in the process of updating the 1990 General Plan. Until an updated General Plan is adopted, the policies in Table 4.14-1 remain in effect.

b. Vacaville Municipal Code

The City's Municipal Code includes regulations that govern the transportation system. The Land Use and Development Code and the Traffic Impact Mitigation Ordinance are of particular relevance to the project. The Land Use and Development Code identifies off-street parking requirements for each type of land use. The Traffic Impact Mitigation Ordinance establishes a procedure to assess and mitigate the potential impacts of proposed development projects on the transportation system. The Ordinance establishes traffic impact standards, which specifically allow City decision-makers to allow and

[3] Solano Transportation Authority, *Solano Comprehensive Transportation Plan*, adopted June 8th 2005.

TABLE 4.14-1 **CITY OF VACAVILLE GENERAL PLAN POLICIES RELEVANT TO TRANSPORTATION AND CIRCULATION**

Policy Number	Policy Content
Policy 6.1-G 1	Strive to maintain LOS C as the minimum standard at all intersections, interchanges, and road links. Design improvements to provide for LOS C in the year 2025 based on the City's development forecast.
Policy 6.1-G 2	LOS D, for a particular intersection, interchange or road link, shall be allowed by a decision maker on a project as an interim level of service where improvements are programmed by the City which will improve the level of service to LOS C or better. LOS D may also be approved by the City as an allowable standard by the City Council or designee for infill areas or situations where existing development or other practical considerations limit improvements.
Policy 6.1-G 3	LOS E or LOS F for a particular intersection, interchange or road link may be allowed by the City Council on the basis of one of the following findings: <u>Finding 1</u> ¨ The interchange, intersection or road link that will experience the projected lower level of service is an infill or isolated area; and ¨ There is no practical and feasible way to mitigate the lower level of service; and ¨ The project resulting in the lower level of service is of clear, overall public benefit. <u>Finding 2</u> ¨ A capital improvement project is reasonably scheduled to be completed which will improve the projected level of service to LOS D or better; and ¨ The interim impact of the projected traffic congestion is offset by the public benefits of the project. <u>Finding 3</u> ¨ The City has entered into a development agreement which legally commit the City to approve the proposed project.
Policy 6.1-G 4	Maintain the Standard Specification for Public Improvements document for the City's roadway network, including private streets.
Policy 6.1-I 1	Design roadway improvements and evaluate development proposals based on LOS standards prescribed in Policy 6.1-GI, 6.1-G2, 6.1-G3.

TABLE 4.14-1 **CITY OF VACAVILLE GENERAL PLAN POLICIES RELEVANT TO TRANSPORTATION AND CIRCULATION** (CONTINUED)

Policy Number	Policy Content
Policy 6.1-I 3	Ensure that traffic improvements necessary to serve the development without violating the level of service standards of the Transportation Element will be in place in time to accommodate trips generated by the project through continued implementation of the City's Traffic Impact Mitigation program.
Policy 6.1-I 4	Improve circulation facilities as needed to maintain traffic levels of service and safety on major arterials.
Policy 6.1-I 6	In order to ensure that adequate roadway capacity is provided for the buildout of the General Plan and that new developments do not preclude the construction of adequate circulation facilities, require all new development to provide right-of-way improvements consistent with the Transportation Element, the City's computerized traffic model and the Standard Specifications.
Policy 6.2-G 2	Coordinate, to the extent feasible, transportation system improvements with neighboring jurisdictions.
Policy 6.2-G 4	Locate high traffic-generating uses so that they have direct access or immediate secondary access to arterial roadways.
Policy 6.2-I 1	Maximize the carrying capacity of arterial roadways by controlling the number of intersections and driveways, minimizing residential access and requiring sufficient on-site parking to meet the needs of each project.
Policy 6.3-G 1	Design local roadways and implement traffic-control measures to maintain LOS C on local streets.
Policy 6.3-G 2	Design new collector roadways and implement traffic-control measures where feasible to maintain LOS C on these new collector roadways.
Policy 6.3-G 3	Discourage through-traffic on local roadways.
Policy 6.3-I 1	Avoid adding traffic to roadways carrying volumes above the standards.
Policy 6.3-I 2	Design local roadways as short, discontinuous roadways to discourage use by through-traffic.
Policy 6.3-I 3	Control access to auto-oriented commercial areas by use of median strips and frontage roads to assure safety and minimize traffic conflicts.
Policy 6.4-G 4	Cooperate with public agencies and other entities to promote local and regional public transit serving Vacaville.
Policy 6.4-I 6	Require facilities for future transit use when designing improvements for roadways.

TABLE 4.14-1 **CITY OF VACAVILLE GENERAL PLAN POLICIES RELEVANT TO TRANSPORTATION AND CIRCULATION** (CONTINUED)

Policy Number	Policy Content
Policy 6.4-I 7	Design local transit to plan for local bus routes that improve service for potential riders. This includes improvements such as bus turn-outs and shelters and related facilities.
Policy 6.4-I 11	Remove physical barriers to improve access to transit facilities for the elderly, handicapped, and other transit-dependent groups.
Policy 6.5-G 1	Establish a comprehensive network of on- and off-roadway bike routes to encourage the use of bikes for commute, recreational and other trips.
Policy 6.5-G 3	Develop bike and pedestrian routes that provide access to schools, historic sites, governmental services, major commercial centers, parks, and regional open space.
Policy 6.5-G 4	Ensure safe, pleasant, and convenient pedestrian paths, sidewalks, and trails to accommodate all segments of the population.
Policy 6.5-G 5	Continue to support programs to improve the mobility of the elderly and handicapped, remove existing architectural barriers, and require that new development be accessible to those with physical impairments.
Policy 6.5-I 3	Provide adequate public and private bicycle parking and storage facilities as part of new multifamily and non-residential developments. Design standards in the off-street parking section of the Land Use and Development Code require bicycle racks be installed in retail areas, major employment center, public facilities, and apartments.
Policy 6.5-I 4	Develop a series of continuous pedestrian walkways within Downtown and residential neighborhoods.

Source: Vacaville General Plan, 1990.

accept LOS D without mitigation improvements. This standard is more lenient than that indicated in the General Plan, where Policy 6.1-G1 has established a minimum standard of LOS C for all intersections, road links, and interchanges. The Traffic Impact Mitigation Ordinance also provides for LOS E and LOS F approval under defined circumstances similar to those identified in General Plan Policy 6.1-G 3.

The City's Traffic Impact Mitigation Ordinance requires traffic studies for development projects found to meet the trip generation thresholds established