
13. NOISE

This EIR chapter describes the existing noise environment in the Middle Green Valley Specific Plan area and vicinity, anticipated changes in that noise environment as a result of the proposed Specific Plan, and related significant noise impacts and mitigation needs.

13.1 SETTING

13.1.1 Fundamentals of Acoustics

(a) Definitions of Noise. Noise is defined as unwanted sound. The effects of noise can range from interference with sleep, concentration, and communication, to physiological stress, and at higher noise levels, hearing loss.

(b) Noise Measurement. Sound levels are usually measured and expressed in decibels (dB), with 0 dB corresponding roughly to the threshold of hearing. The term "decibels" and other related technical terms are defined in Table 13.1 herein.

The method commonly used to quantify environmental noise involves measurement of all frequencies of sound, with an adjustment to reflect the fact that human hearing is less sensitive to low and high frequencies than to midrange frequencies. This measurement adjustment is called "A" weighting. A noise level so measured is called an A-weighted sound level (dBA).¹ Examples of typical A-weighted noise levels in the environment and industry are provided in Table 13.2.

Environmental noise fluctuates in intensity over time. Therefore, time-averaged noise level computations are typically used to quantify noise levels and determine impacts. The two average noise level descriptors most commonly used are dB L_{dn} and dB CNEL. L_{dn}, the day/night average noise level, is the 24-hour average, with a 10-dBA penalty added for nighttime noise (10:00 PM to 7:00 AM) to account for the greater human sensitivity to noise during this period. CNEL, the community equivalent noise level, is similar to L_{dn}, but adds a five-dBA penalty to evening noise (7:00 PM to 10:00 PM).

One way of anticipating a person's subjective reaction to a new noise is to compare the new noise with the existing noise environment to which the person has become adapted, i.e., the so-called "ambient" noise level. With regard to increases in A-weighted noise levels, knowledge of the following relationships will be helpful in understanding this EIR chapter:

- except in carefully controlled laboratory experiments, a change of one dBA cannot be perceived;

¹In practice, the level of a sound source is conveniently measured using a sound level meter that includes an electrical filter corresponding to the A-weighting curve.

Table 13.1
DEFINITIONS OF ACOUSTICAL TERMS

<u>Term</u>	<u>Definitions</u>
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. 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.
L_{01} , L_{10} , L_{50} , L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 PM to 10:00 PM and after addition of 10 decibels to sound levels in the night between 10:00 PM and 7:00 AM.
Day/Night Noise Level, L_{dn}	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 PM and 7:00 AM.
L_{max} , L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Single-Event Noise Exposure Level (SEL)	The sound exposure level of a single noise event (such as an aircraft flyover or a train passby) measured over the time interval between the initial and final times for which the sound level of the single event exceeds the background noise level.

SOURCE: Illingworth & Rodkin, Inc.

Table 13.2
TYPICAL SOUND LEVELS MEASURED IN THE ENVIRONMENT AND INDUSTRY

<u>At a Given Distance from Noise Source</u>	<u>A-Weighted Sound Level in Decibels</u>	<u>Noise Environments</u>	<u>Subjective Impression</u>
	140		
Civil Defense Siren (100')	130		
Jet Takeoff (200')	120		Pain Threshold
	110	Rock Music Concert	
Pile Driver (50')	100		Very Loud
Ambulance Siren (100')			
	90	Boiler Room	
Freight Cars (50')		Printing Press Plant	
Pneumatic Drill (50')	80	In Kitchen With Garbage Disposal Running	
Freeway (100')			
	70		Moderately Loud
	60	Data Processing Center	
		Department Store	
Light Traffic (100')	50	Private Business Office	
Large Transformer (200')			
	40		Quiet
Soft Whisper (5')	30	Quiet Bedroom	
	20	Recording Studio	
	10		Threshold of Hearing
	0		

SOURCE: Illingworth & Rodkin, Inc.

- outside of the laboratory, a three-dBA change is considered a just-perceivable difference;
- a change in noise level of at least five dBA is required before any noticeable change in community response would be expected; and
- a 10-dBA increase is subjectively heard as approximately a doubling in loudness, and would almost certainly cause an adverse change in community response.

(b) Structural Attenuation. Typical residential structure noise attenuation is 12 to 17 dBA with open windows. With closed windows in good condition, the noise attenuation factor is around 20 dBA for an older structure and 25 dBA for a newer dwelling.

(c) Typical Noise Levels. Levels of 55 to 60 dBA are common along collector streets and secondary arterials, while 65 to 70 dBA is a typical value for a primary/major arterial. Levels of 75 to 80 dBA are normal noise levels at the first row of development outside a freeway right-of-way.

In typical planning practice, noise levels of 60 dB L_{dn} /CNEL are often used as a benchmark when assessing noise levels. Outdoor noise levels that exceed 60 dB L_{dn} /CNEL are generally considered inappropriate in residential areas.

13.1.2 Sleep and Speech Interference

Indoors, the thresholds for speech interference are about 45 dBA if the noise is steady and above 55 dBA if the noise is fluctuating. Outdoors the thresholds are about 15 dBA higher. Steady noise of sufficient intensity (above 35 dBA) and fluctuating noise levels above about 45 dBA have been shown to affect sleep. Interior residential standards for multi-family dwellings are set by the State of California at 45 dBA L_{dn} .

As noted above, typical structural attenuation is 12 to 17 dBA with open windows; with closed windows in good condition, the noise attenuation factor is around 20 dBA for an older structure and 25 dBA for a newer dwelling. Sleep and speech interference is therefore possible when exterior noise levels are about 57 to 62 dBA L_{dn} with open windows and 65 to 70 dBA L_{dn} if the windows are closed. Also as noted above, noise levels of 55 to 60 dBA are common along collector streets and secondary arterials, while 65 to 70 dBA is a typical value for a primary/major arterial. Levels of 75 to 80 dBA are normal noise levels at the first row of development outside a freeway right-of-way. In order to achieve an acceptable interior noise environment, bedrooms facing secondary roadways need to be able to have their windows closed, and those facing major roadways and freeways typically need special glass windows.

13.1.3 Existing Noise Environment

The major noise sources in Solano County consist of highway and local thoroughfare traffic, commercial and industrial uses, active recreation areas (in parks), school outdoor play areas, railroad operations, and aircraft overflights. In the plan area vicinity, the principal sources of environmental noise are Green Valley Road, Rockville Road, the I-80 freeway, the Union Pacific Railroad (UPRR) line south of and roughly parallel to I-80, and Travis Air Force Base aviation traffic.

For the 2008 Solano County General Plan update, future noise contours¹ were estimated for key roadways, railroad lines, and aircraft routes in the county and were then considered in formulating General Plan land use policies and development standards. Existing and projected future noise contour data for four of the five key noise sources in the plan area vicinity--Rockville Road, the I-80 freeway, the UPRR tracks south of and roughly parallel to I-80, and Travis Air Force Base aircraft traffic--are presented in the General Plan noise section (Public Health and Safety chapter pages HS-76 through HS-90) and companion 2008 Solano County General Plan Draft EIR (pages 4.3-1 through 4.3-33). The data indicate that the projected future (2030) 60 dBA L_{dn} noise contours for Rockville Road, I-80, the UPRR tracks, and Travis aircraft traffic would not fall within the Middle Green Valley Specific Plan area.

The Solano County General Plan noise section does not present data for Green Valley Road, presumably because Green Valley Road was not projected to be a generator of average roadside noise levels of 60 dBA L_{dn} or greater. Existing noise levels along Green Valley Road in the plan area vicinity are generally below 60 dBA L_{dn}.² Based on traffic data prepared for this EIR, however, traffic noise along Green Valley Road can be expected to increase in the future. (See further discussion under *Impact 13-1* below.)

13.2 PERTINENT PLANS AND POLICIES

CEQA requires an EIR to identify the plan and policy setting within which the project is proposed and discuss any inconsistencies between the proposed project and these applicable plans and policies adopted to minimize environmental impacts [CEQA Guidelines sections 15124(b) and 15125(d)]. Adopted local policies pertinent to consideration of the potential noise impacts of the proposed Specific Plan are described below.

13.2.1 Solano County General Plan

Those policies and implementation programs from the 2008 Solano County General Plan that are pertinent to consideration of the proposed Specific Plan and its potential noise impacts are listed below. Where any proposed Specific Plan land use and development policy or standard is found in this EIR to be potentially inconsistent with one or more of these County-adopted noise policies or implementation programs, a potentially significant environmental impact and one or more associated mitigations will be identified for incorporation into the Specific Plan to reduce the impact and better implement the General Plan. Otherwise, the proposed Specific Plan will be considered consistent with the noise policies and implementation programs listed below.

The General Plan also presents a noise and land use compatibility matrix (General Plan Table HS-2; see Table 13.3 below) to identify acceptable and unacceptable noise level ranges for specific land use types. The matrix is based on the State of California Land Use Noise

¹A local noise environment is typically described for planning and EIR purposes with "contours" derived from monitoring and modeling major sources of noise. A noise contour is a line overlaid on a map that depicts where a certain noise level occurs.

²This observation is supported by a 2006 short-term noise measurement made north of the plan area, off Rockville Road west of Sidney Jones Drive, as background for the General Plan update (Solano County General Plan Update Noise Background Report, Table 12-3). The measurement produced an estimated L_{dn} of 45.

Table 13.3
SOLANO COUNTY LAND USE NOISE COMPATIBILITY GUIDELINES

LAND USE CATEGORY	COMMUNITY NOISE EXPOSURE Ldn or CNEL, dB					
	55	60	65	70	75	80
Residential – Low Density Single Family, Duplex, Mobile Home	[Solid Gray]		[Diagonal Hatching]		[Solid Black]	[Cross-hatching]
Residential – Multi-family	[Solid Gray]		[Diagonal Hatching]		[Solid Black]	[Cross-hatching]
Transient Lodging – Motel, Hotel	[Solid Gray]		[Diagonal Hatching]		[Solid Black]	[Cross-hatching]
Schools, Libraries, Churches, Hospitals, Nursing Homes	[Solid Gray]		[Diagonal Hatching]		[Solid Black]	[Cross-hatching]
Auditoriums, Concert Halls, Amphitheaters	[Diagonal Hatching]		[Cross-hatching]		[Solid Black]	[Cross-hatching]
Sports Arena, Outdoor Spectator Sports	[Diagonal Hatching]		[Diagonal Hatching]		[Cross-hatching]	[Cross-hatching]
Playgrounds, Neighborhood Parks	[Solid Gray]		[Solid Black]		[Cross-hatching]	[Cross-hatching]
Golf Courses, Riding Stables, Water Recreation, Cemeteries	[Solid Gray]		[Solid Black]		[Cross-hatching]	[Cross-hatching]
Office Buildings, Business Commercial, Professional	[Solid Gray]		[Diagonal Hatching]		[Solid Black]	[Cross-hatching]
Industrial, Manufacturing, Utilities, Agriculture	[Solid Gray]		[Diagonal Hatching]		[Solid Black]	[Cross-hatching]
 Normally Acceptable Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.	 Normally Unacceptable New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.					
 Conditionally Acceptable New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning, will normally suffice.	 Clearly Unacceptable New construction or development should generally not be undertaken.					

SOURCE: Solano County General Plan, December 2008, Table HS-2.

Compatibility Matrix for evaluating the compatibility of proposed land uses with the onsite noise environment. In addition, the General Plan establishes noise standards for new uses affected by traffic and railroad noise (General Plan Table HS-3; see Table 13.4 below) and non-transportation noise standards (General Plan Table HS-4; see Table 13.5 below).

The General Plan includes the following specific policies and implementation programs pertinent to consideration of the noise impacts of the proposed Specific Plan:

- *Consider and promote land use compatibility between noise-sensitive* and noise-generating land uses when reviewing new development proposals. [*For the purposes of this chapter, noise-sensitive land uses include schools, hospitals, rest homes, long-term care, mental care facilities, and residences. Outdoor activity areas are considered to be the portion of a noise-sensitive property where outdoor activities would normally be expected (i.e., patios of residences and outdoor instructional areas of schools). Outdoor activity areas for the purposes of this section do not include gathering spaces alongside transportation corridors or associated public rights-of-way.] (Policy HS.P-48)*
- *Encourage design that minimizes negative effects of noise without compromising aesthetic values and pedestrian and auto connectivity. (Policy HS.P-49)*
- *Develop strategies with residents and businesses to reduce noise conflicts. (Policy HS.P-51)*
- *Minimize noise conflicts between current and proposed land uses and transportation networks by encouraging compatible land uses around critical areas with higher noise potential. (Policy HS.P-52)*
- *When reviewing new development proposals,*
 - *Require noise abatement measures to ensure that noise levels will not exceed those indicated in Tables HS-3 and HS-4.*
 - *Require buffering between noise-sensitive land uses and noise sources unless a detailed noise analysis is conducted and noise abatement measures can be taken to reduce noise to acceptable levels as shown on Tables HS-3 and HS-4.*
 - *Where development projects produce, or are affected by, nontransportation-related noise, require the inclusion of project features that will enable the project to achieve acceptable levels specified in Table HS-4, as measured at outdoor activity areas of existing and planned noise-sensitive land uses.*
 - *Require noise mitigation to reduce construction and other short-term noise impacts as a condition of approval for development projects by applying the performance standards outlined in Table HS-4. The total noise level resulting from new sources and ambient noise shall not exceed the standards in Table HS-4, as measured at outdoor activity areas of any affected noise sensitive land use except:*
 - *If the ambient noise level exceeds the standard in Table HS-4, the standard becomes the ambient level plus 5 dB.*

Table 13.4
SOLANO COUNTY NOISE STANDARDS FOR NEW USES AFFECTED BY TRAFFIC AND RAILROAD NOISE

<u>New Land Use</u>	<u>Sensitive Outdoor Area (dBA L_{dn})</u>	<u>Sensitive Interior¹ Area (dBA L_{dn})</u>	<u>Notes</u>
All Residential	65	45	2
Transient Lodging	65	45	2, 3
Hospitals and Nursing Homes	65	45	2, 3, 4
Theaters and Auditoriums	---	35	3
Churches, Meeting Halls, Schools, Libraries, etc.	65	40	3
Office Buildings	65	45	3
Commercial Buildings	---	50	3
Playgrounds, Parks, etc.	70	---	
Industry	65	50	3

SOURCE: Solano County General Plan, December 2008, Table HS-3.

dBA = A-weighted decibels, L_{dn}= day-night average noise level

¹ Interior noise level standards are applied within noise-sensitive areas of the various land uses, with windows and doors in the closed positions.

² If these uses are affected by nighttime railroad passages, the potential for sleep disturbance shall be addressed.

³ Where there are no sensitive exterior spaces proposed for these uses, only the interior noise level standard shall apply.

⁴ Hospitals are often noise-generating uses. The exterior noise level standards for hospitals are applicable only at clearly identified areas designated for outdoor relaxation by either hospital staff or patients.

Table 13.5
SOLANO COUNTY NON-TRANSPORTATION NOISE STANDARDS

Receiving Land Use	Outdoor Area		Interior ² – Day and Night Average dBA L _{eq} /maximum dBA L _{max} ¹	Notes
	Average dBA L _{eq} /Maximum dBA L _{max} ¹			
	Daytime	Nighttime		
All Residential	55/70	50/65	35/55	
Transient Lodging	55/75	---	35/55	3
Hospitals and Nursing Homes	55/75	---	35/55	4, 5
Theaters and Auditoriums	---	---	30/50	5
Churches, Meeting Halls, Schools, Libraries, etc.	55/75	---	35/60	5
Office Buildings	60/75	---	45/65	5
Commercial Buildings	55/75	---	45/65	5
Playgrounds, Parks, etc.	65/75	---	---	5
Industry	60/80	---	50/70	5

SOURCE: Solano County General Plan, December 2008, Table HS-4.

L_{eq} = equivalent or energy-averaged sound level, L_{max} = highest root-mean-square sound level measured over a given period of time

¹ The standards shall be reduced by 5 dBA for sounds consisting primarily of speech or music, and for recurring impulsive sounds. If the existing ambient noise level exceeds the standards, then the noise level standards shall be increased at 5-dBA increments to encompass the ambient.

² Interior noise level standards are applied within noise-sensitive areas of the various land uses, with windows and doors in closed positions.

³ Outdoor activity areas of transient lodging facilities are not commonly used during nighttime hours.

⁴ Hospitals are often noise-generating uses. The exterior noise level standards for hospitals are applicable only at clearly identified areas designated for outdoor relaxation by either hospital staff or patients.

⁵ The outdoor activity areas of these uses (if any) are not typically used during nighttime hours.

- *Reduce the applicable standards in Table HS-4 by 5 dB if they exceed the ambient level by 10 or more dB.*
- *Under the conditions outlined below, require acoustical studies to be prepared as part of the development review process to ensure adequate analysis of proposed development and incorporation of noise reducing features in project designs. Acoustical studies with appropriate noise abatement measures will be required for all discretionary projects where any of the following conditions apply:*
 - o *The project is located within the existing or future 60 dB CNEL transportation noise contours as measured at outdoor activity areas of noise-sensitive land uses.*
 - o *The project will cause future traffic volumes to exceed 5,000 average daily trips on any roadway that fronts residential, institutional, and open space land uses or will cause traffic volume to increase by 25 percent or more, on any of these roadways.*
 - o *The project will introduce noise or vibration sources associated with mechanical equipment operations, entertainment, maintenance, and facility operations.*
 - o *The project is a proposed residential use in the vicinity of existing and proposed commercial and industrial areas.*
 - o *The project is proposed in an area where existing noise levels exceed acceptable levels in Table HS-4 as measured at outdoor activity areas of noise sensitive land uses.*
- *Where it is not possible to reduce noise levels in outdoor activity areas to 60 dB or less using practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB may be allowed, provided that all available exterior noise level reduction measures have been implemented. (Implementation Program HS.I-67)*
- *Promote the use of berms, landscaping, setbacks, or architectural design for noise abatement, in addition to conventional wall barriers, to enhance aesthetics and minimize pedestrian barriers. Development of noise-sensitive land uses in areas exposed to existing or projected levels of noise from transportation, stationary sources, or agricultural operations exceeding, or estimated to exceed, levels specified in Table HS-2 shall require transportation planning, traffic calming, site planning, buffering, sound insulation, or other methods to reduce noise exposure in outdoor activity areas and interior spaces to the levels specified in Table HS-2. (Implementation Program HS.I-69)*

13.3 IMPACTS AND MITIGATION MEASURES

13.3.1 Significance Criteria

Based on the CEQA Guidelines, the proposed Specific Plan would be considered in this EIR to have a significant impact on the noise environment if it would result in:¹

- (a) exposure of persons to or generation of noise levels in excess of standards established in the local General Plan or Noise Ordinance, or applicable standards of other agencies;
- (b) exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;
- (c) a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project; or
- (d) a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

A significant impact would be identified if proposed land uses would be exposed to noise levels exceeding the County's established guidelines for noise and land use compatibility. A significant noise impact would also result if noise levels increase substantially at existing noise-sensitive land uses (e.g., residences). Following common noise impact assessment practice, a Specific Plan-related increase in noise level (e.g., traffic noise) of 5 dBA or more above an existing acceptable ambient noise level at a sensitive receptor (e.g., at the property line of a residential, school, hospital, or other noise-sensitive use) would constitute a significant impact.

Construction noise levels would be treated differently because they are temporary and intermittent. Significant noise impacts would result from construction if noise levels are sufficiently high to interfere with speech, sleep, or normal residential activities. Construction-related hourly average noise levels received at noise-sensitive land uses above 60 dBA during the daytime and 55 dBA at night and at least 5 dBA higher than ambient noise levels would be considered significant. To cause a significant impact, construction activities affecting a receptor must persist for more than one construction season.

13.3.2 Relevant Project Characteristics

As described in chapter 2, Project Description, of this EIR, the Specific Plan proposes development of housing, community/public services uses, "agricultural tourism" uses, and neighborhood commercial uses clustered in four neighborhoods. The remaining approximately 78 percent of land in the plan area would be preserved as open land.

Some rural residential development allowed by the Specific Plan would be located along Green Valley Road, which extends generally in a northwest-southeast direction through the Specific Plan area.

Under the proposed Specific Plan, future community/public services uses in the plan area may include a fire station and/or a wastewater treatment plant. If developed, these land uses would

¹CEQA Guidelines, Appendix G, Items XI(a) through XI(d).

likely be located on sites adjoining future housing enabled by the Specific Plan. (See further discussion in chapter 16, Public Services and Utilities, of this EIR.)

In addition, the Draft Specific Plan includes a designated 10-acre site in the northwestern corner of the proposed Nightingale Neighborhood for future accommodation of an elementary school. (See further discussion in chapter 16, Public Services and Utilities, of this EIR.)

13.3.3 Impacts and Mitigation Measures

Impact 13-1: Impact of Green Valley Road Traffic Noise on Specific Plan-Facilitated Residential Development. The Draft Specific Plan (DSP) designated neighborhood framework (DSP section 3.2.1) has been formulated with the intent to separate noise sensitive land uses from Green Valley Road. Nevertheless, DSP-designated residential development in the Three Creeks Neighborhood along Green Valley Road may be exposed to traffic noise that exceeds “normally acceptable” levels established by the Solano County General Plan (i.e., noise greater than 60 dBA L_{dn}), representing a ***potentially significant impact*** (see criteria [a] and [b] in subsection 13.3.1, “Significance Criteria,” above).

The Specific Plan would facilitate development in the plan area as described in chapter 2 of this EIR. Residents and other occupants of the plan area would be exposed to various existing and projected noise sources, including traffic noise from Green Valley Road.

The compatibility of the proposed Specific Plan land uses with the existing and projected noise environment has been evaluated based on the guidelines identified in Table 13.3 (General Plan Table HS-2). Residential development is considered normally acceptable in noise environments of 60 dBA L_{dn} or less.

Future traffic noise along Green Valley Road has been estimated using year 2030 traffic data prepared for the EIR by Abrams Associates, the EIR traffic engineers.¹ Based on the traffic data, the future 60 L_{dn} noise contour would be located about 100 feet from the near-lane center line of Green Valley Road, and the 65 L_{dn} noise contour would be located about 50 feet from the near-lane center line of the road.

The Specific Plan would allow residential development in the *Rural Farm* and *Agricultural-Residential* designations along portions of Green Valley Road, as shown on Figure 2.3 in chapter 2, Project Description, of this EIR. This residential development may be exposed to traffic noise that exceeds “normally acceptable” levels defined by the Solano County General Plan.

¹Abrams Associates, Traffic Impact Study for the Middle Green Valley Specific Plan in Solano County, October 2009.

Mitigation 13-1. For project-specific residential development proposals on sites adjoining Green Valley Road, the County shall require applicants to conduct site-specific noise studies that identify, to County satisfaction, noise reduction measures that would be included in final design to meet State and County noise standards. These measures may include the following:

- Minimizing noise in residential outdoor activity areas (i.e., ensuring that noise levels would be below 65 dBA L_{dn}) by locating the areas at least 50 feet from the center line of Green Valley Road and/or behind proposed buildings.
- Providing air conditioning in all houses located within 100 feet of Green Valley Road so that windows can remain closed to maintain interior noise levels below 45 dBA L_{dn} .

Implementation of these measures would reduce the impact to a ***less-than-significant level***.

Impact 13-2: Effect of Proposed Noise-Generating Land Uses on Noise-Sensitive Land Uses. Noise-generating land uses facilitated by the Draft Specific Plan, such as agricultural activities, commercial uses, and the possible fire station and wastewater treatment plant, may expose noise-sensitive uses such as housing, recreational areas, and the possible future onsite school to noise and/or vibration. Possible noise exposure exceeding State and Solano County standards represents a ***potentially significant impact*** (see criteria [a] through [c] in subsection 13.3.1, "Significance Criteria," above).

Proposed onsite agricultural and commercial activities and the possible future onsite fire station and/or wastewater treatment plant may expose noise-sensitive residential, recreational, and school uses in or adjoining the Specific Plan area to noise levels exceeding "normally acceptable" levels. See chapter 12, Land Use and Open Space, of this EIR for further discussion of the relationships among these land uses and the potential for conflicts and incompatibilities.

As described in more detail in chapters 2 and 16 of this EIR, a fire station and/or wastewater treatment plant may be developed in the Specific Plan area. Major sources of noise from a fire station may include (1) use of external stationary alarms used to alert personnel and surrounding residents of an emergency response in progress, (2) use of alarms mounted on trucks leaving the station when responding to an emergency, and (3) engine noise from trucks traveling on local roads. These emergency services-related noise sources are exempt from local noise policies such as those included in the Public Health and Safety Element of the Solano County General Plan. In a wastewater treatment plant, noise sources may include operation of mechanical equipment such as electric pump motors and lift motors.

Mitigation 13-2. New noise-generating uses facilitated by the Specific Plan shall be subject to the noise compatibility guidelines, standards, policies, and implementation programs established by the Solano County General Plan. In accordance with General Plan Implementation Program HS.I-67, noise analysis and acoustical studies shall be conducted for proposed noise-generating uses, as determined necessary by the County, and noise abatement measures shall be included to County satisfaction to ensure compliance with applicable guidelines and standards.

In addition, new noise-sensitive uses developed adjacent to noise-generating uses shall be designed to control noise to meet the noise compatibility guidelines, standards, policies, and implementation programs established by the Solano County General Plan. In accordance with General Plan Implementation Program HS.I-67, noise analysis and acoustical studies shall be conducted for proposed noise-sensitive uses, as determined necessary by the County, and noise attenuation features shall be included to ensure compliance with applicable guidelines and standards.

Implementation of these measures would reduce this impact to a ***less-than-significant level***.

Impact 13-3: Specific Plan-Facilitated Construction Noise. Existing and future rural residential and other potential noise-sensitive land uses throughout the Specific Plan area could be intermittently exposed to noise from Specific Plan-facilitated future, project-specific construction activity, representing a ***potentially significant impact*** (see criterion [d] in subsection 13.3.1, "Significance Criteria," above).

Construction activities facilitated by the Specific Plan could include site grading and preparation, building demolition, building modification and rehabilitation, construction of new buildings, and installation of utilities. Construction activities generate noise, especially during the demolition phase and the construction of project infrastructure when heavy equipment is used. The effects of noise resulting from construction depend on the noise generated by various pieces of construction equipment, the timing and duration of noise-generating activities, and the distance between construction noise sources and noise-sensitive receptors. Although construction noise would be localized to the individual site location, rural residences and other land uses throughout the plan area would be intermittently exposed to high levels of noise throughout construction.

Mitigation 13-3. To reduce noise impacts from Specific Plan-related construction activities, the County shall require future project-specific discretionary developments to implement the following measures, as appropriate:

- *Construction Scheduling.* Ensure that noise-generating construction activity is limited to between the hours of 7:00 AM to 8:00 PM, Monday through Friday, and that construction noise is prohibited on Saturdays, Sundays, and holidays.
- *Construction Equipment Mufflers and Maintenance.* Equip all internal combustion engine-driven equipment with intake and exhaust mufflers that are in good condition and appropriate for the equipment.
- *Equipment Locations.* Locate stationary noise-generating equipment as far as possible from sensitive receptors when sensitive receptors adjoin or are near a construction project site.
- *Construction Traffic.* Route all construction traffic to and from the construction sites via designated truck routes where possible. Prohibit construction-related heavy truck traffic in residential areas where feasible.
- *Quiet Equipment Selection.* Use quiet construction equipment, particularly air compressors, wherever possible.
- *Noise Disturbance Coordinator.* For larger construction projects, designate a "Noise Disturbance Coordinator" who would be responsible for responding to any local complaints about construction noise. The Disturbance Coordinator would determine the cause of the noise complaint (e.g., starting too early, bad muffler, etc.) and institute reasonable measures to correct the problem. Conspicuously post a telephone number for the Disturbance Coordinator at the construction site and include it in the notice sent to neighbors regarding the construction schedule. (The County should be responsible for designating a Noise Disturbance Coordinator and the individual project sponsor should be responsible for posting the phone number and providing construction schedule notices.)

Implementation of these measures would reduce this impact to a ***less-than-significant level***.

Impact 13-4: Specific Plan-Facilitated and Cumulative Traffic Noise Impacts on Green Valley Road. Traffic from Specific Plan-facilitated development would increase traffic noise levels on Green Valley Road by 3 to 4 dB above existing levels. While the Specific Plan-related traffic noise increase alone would not represent a significant impact, its contribution to the cumulative traffic noise increase on Green Valley Road south of Eastridge Drive would represent a **significant cumulative impact** (see criteria [a] and [c] in subsection 13.3.1, "Significance Criteria," above).

The proposed Specific Plan would change noise levels by facilitating new development in the Specific Plan area and increasing traffic on local roads.

The significance of vehicular traffic noise increases resulting from implementation of the Specific Plan was evaluated by comparing existing noise levels to noise levels from increased traffic that would result from Specific Plan buildout. The anticipated traffic volume increase could result in increased traffic-generated noise at some residences along Green Valley Road. Total noise level increases of 5 dBA or more would be considered significant in this environment (see subsection 13.3.1, "Significance Criteria," above). Traffic noise level increases were calculated based on the change between existing traffic volumes and the future condition traffic volumes provided by Abrams Associates. In addition to local traffic noise, distant traffic noise sources contribute to existing noise levels in the plan area. Calculated traffic noise levels do not take into account shielding by terrain or structures.

Specific Plan-related traffic is predicted to result in a traffic noise increase of 3 to 4 dB above existing levels along Green Valley Road north of Mangels Boulevard in the vicinity of the plan area. The total cumulative traffic noise increase along Green Valley Road would range from 4 dBA L_{dn} to less than 5 dBA L_{dn} , except along the northbound segment south of Eastridge Drive where the increase would 5 to 6 dBA L_{dn} . This increase would be a significant impact, since total noise level increases of 5 dBA or more would be considered significant in this environment.

While the Specific Plan-related traffic noise increase would be less than 5 dBA, the Specific Plan's contribution would represent a considerable proportion of the cumulative traffic noise increase along Green Valley Road, including the northbound segment south of Eastridge Drive where a significant increase (5 to 6 dBA) is anticipated. The Specific Plan would therefore make a considerable contribution to the cumulative traffic noise increase.

Mitigation 13-4. To reduce the traffic noise increase along Green Valley Road, the County should consider the use of noise-reducing pavement, along with traffic calming measures (which could achieve noise reductions of approximately 1 dBA for each 5 mile-per-hour reduction in traffic speed). These measures may not be feasible, however, and may not be directly applicable to the Specific Plan, particularly since the segment of Green Valley Road where the highest traffic noise increase is expected (the northbound segment south of Eastridge Drive) is not within the Specific Plan area. The Specific Plan's contribution to the cumulative traffic noise increase along Green Valley Road is therefore considered a **significant unavoidable impact**.