

9

NOISE

The Noise chapter of the EIR describes the existing noise environment in the project vicinity, and identifies potential impacts and mitigation measures related to the construction and operation of the proposed Timberline at Auburn project (proposed project). The method by which the potential impacts are analyzed is discussed, followed by the identification of potential impacts and the recommended mitigation measures designed to reduce significant impacts to levels that are less than significant. The Noise chapter is primarily based on the *Timberline at Auburn Environmental Noise Assessment* prepared by j.c. brennan & associates, Inc. (See Appendix V),¹ the *Placer County General Plan (PCGP)*,² the *PCGP Final EIR*,³ the *PCGP Background Report*,⁴ the *Auburn/Bowman Community Plan (ABCP)*,⁵ and the *Placer County Noise Ordinance*.⁶

The impact already identified in the Timberline at Auburn Project Initial Study (See Appendix C) as having *no impact* (expose people residing or working in the project area to excessive noise from private airstrip) is not further addressed within this chapter. The impacts identified as *potentially significant* in the Initial Study are addressed below in this chapter.

9.1 ENVIRONMENTAL SETTING

The Existing Environmental Setting section includes a discussion of acoustical terminology, the effects of noise on people, existing sensitive receptors in the project vicinity, groundborne vibration, and existing ambient and traffic noise levels in the project vicinity.

Acoustical and Vibration Terminology

Acoustics is the term applied to the science of sound. Sound may be thought of as mechanical energy of a vibrating object transmitted by pressure waves by a common medium (e.g. air, water) to the human ear. Sounds are essentially the human ear interpreting pressure variations that occur at least 20 times or more per second. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second or Hertz (Hz).

Noise can be described as a subjective reaction to different types of sounds, which are highly subjective. Sound measurements expressed in terms of pressure would require a very large and awkward range of numbers; therefore, the decibel scale was devised to clearly and concisely represent sound measurements. The decibel scale uses the hearing threshold (20 micropascals), as a point of reference, defined as zero dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers within a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels (dB) correspond closely to human perception of relative loudness.

As mentioned, the perceived loudness of sounds is dependent upon many factors, which may include, but not be limited to the, sound pressure level and frequency content. However, within the

usual range of environmental noise levels, perception of loudness is relatively predictable and can be approximated by A-weighted levels. A strong correlation exists between A-weighted sound levels (expressed as dBA) and the way the human ear perceives sound. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. It is important to note, that all noise levels reported in this section are in terms of A-weighted levels, but are expressed as dB, unless otherwise noted.

The decibel scale is logarithmic, not linear. In other words, two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted, an increase of 10 dB is generally perceived as a doubling in loudness. For example, a 70 dB sound is half as loud as an 80 dB sound, and twice as loud as a 60 dB sound.

Community noise is commonly described in terms of the ambient noise level, which is defined as the “all-encompassing noise level” associated with a given environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level (L_{eq}), which corresponds to a steady-state A-weighted sound level containing the same total energy as a time varying signal over a given time period (usually one hour). The L_{eq} is the foundation of the composite noise descriptor, L_{dn} , and shows very good correlation with community response to noise.

The day/night average level (L_{dn}) is based on the average noise level over a 24-hour day, with a +10 decibel weighting applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based on the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because L_{dn} represents a 24-hour average, the measurement tends to disguise short-term variations in the noise environment. Common indoor and outdoor sources of noise and their associated noise levels are presented in Table 9-1.

Effects of Noise on People

Noise can be generally categorized into one of the following groups: (1) subjective effects of annoyance, nuisance, and dissatisfaction; (2) interference with activities such as speech, sleep, and learning; or (3) physiological effect, including hearing loss or sudden startling. A comparison between the ways a person reacts to a new noise source to the existing ambient background noise helps identify how that person would react. The following relationship occurs, with regards to noise increases in A-weighted noise levels:

- Except in carefully controlled laboratory experiments, a change of one dB cannot be perceived;
- Outside of the laboratory, a three dB change is considered a barely perceivable difference;
- A change in level of at least five dB is required before any noticeable change in human response would be expected; and
- A 10 dB change is subjectively heard as approximately a doubling in loudness, and would typically cause an adverse response.

Table 9-1 Typical Noise Levels		
Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	--110--	Rock Band
Jet Fly-over at 300 m (1,000 ft)	--100--	
Gas Lawn Mower at 1 m (3 ft)	--90--	
Diesel Truck at 15 m (50 ft), at 80 km/hr (50 mph)	--80--	Food Blender at 1 m (3 ft) Garbage Disposal at 1 m (3 ft)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft)	--70--	Vacuum Cleaner at 3 m (10 ft)
Commercial Area Heavy Traffic at 90 m (300 ft)	--60--	Normal Speech at 1 m (3 ft)
Quiet Urban Daytime	--50--	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall (Background)
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing

Source: Caltrans, Technical Noise Supplement, Traffic Noise Analysis Protocol, October 1998.

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

Existing Conditions

Existing Land Uses

The project site is located in unincorporated Placer County. The five parcels comprising the project site are undeveloped and have been previously disturbed from grazing activities and off-road vehicles. The topography of the site is moderately sloping terrain interspersed with grasslands and woodlands.

Approximately one mile west of the Auburn Municipal Airport, the project site is encompassed by existing urban/suburban uses, including subdivisions, single- and multi-family residences, a regional park, schools, hospitals and other medical services, assisted living facilities, and undeveloped lands.

Existing Sensitive Receptors in Project Vicinity

Certain land uses are considered to be more sensitive to changes in the ambient noise than other land uses. Land uses that are considered to be sensitive receptors include residences, schools, libraries, hospitals, and passive recreational areas. Noise-sensitive land uses are typically given special attention in order to achieve protection from excessive noise.

Sensitivity to noise changes is a function of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities involved. Currently, sensitive receptors in the immediate vicinity of the project site include single-family residential uses located adjacently to the north, south, and western site boundaries, with multi-family uses to the east.

Existing Ambient Noise Levels in the Project Vicinity

To quantify existing ambient noise levels in the project vicinity, j.c. brennan & associates, Inc. conducted both short-term and continuous (24-hour) ambient noise measurements on the project site and nearby vicinity. On June 18, 2008, short-term ambient noise level measurements were taken at five different locations (1-5), while long-term ambient noise measurements were gathered over a three-day span (June 20 through 22, 2008) at three separate locations (A-C). The locations of each noise monitoring station are illustrated in Figure 9-1 and the data collected is summarized in Table 9-2. The noise level measurements were conducted for comparison to project-related noise levels and to determine typical background noise levels.

Existing Traffic Noise Levels

Table 9-3 shows the existing traffic noise levels in terms of L_{dn} at a reference distance of 100 feet from the centerlines of the existing project-area roadways identified in the traffic study (existing conditions). The table also includes the distances from the centerline to existing traffic noise contours. The extent to which existing land uses in the project vicinity are affected by existing traffic noise depends on their respective proximity to the roadways and their individual sensitivity to noise.

Existing Aviation Noise Levels

To quantify single-event noise levels from aviation overflights in the project vicinity, j.c. brennan & associates, Inc. conducted both short-term noise level measurements and aircraft observations on June 19, 2008 (Table 9-4). Continuous hourly noise measurements were also gathered over a three-day period by j.c. brennan & associated, Inc. between June 20 through 22, 2008 (Table 9-5). Both the single-event and hourly noise measurements were collected at locations A, B, and C depicted in Figure 9-1. Observations collected at Site 6, also displayed in Figure 9-1, were used to identify aircraft overflights at the continuous noise monitoring sites. Field observations primarily consisted of single-engine aircrafts and helicopters.

**Table 9-2
 Summary of Existing Ambient Noise Monitoring Results of Timberline at Auburn Site**

Site	Location	Date	Average Measured Hourly Noise Levels, dB						
			L _{dn} / CNEL	Daytime (7 a.m.–10 p.m.)			Nighttime (10 p.m.–7 a.m.)		
				L _{eq}	L ₅₀	L _{max}	L _{eq}	L ₅₀	L _{max}
Continuous 24-Hour Noise Measurement Site									
A	Northern Project Boundary	June 20, 2008	54.8	47.6	42.1	65.7	47.9	44.4	56.3
		June 21, 2008	51.6	49.4	42.5	69.6	43.8	43.0	55.6
		June 22, 2009	51.3	50.1	41.6	70.1	42.9	42.4	52.7
B	Southern Project Boundary	June 20, 2008	52.4	46.6	38.1	65.8	45.6	42.1	55.8
		June 21, 2008	49.4	47.4	38.5	67.0	41.5	40.1	54.9
		June 22, 2009	49.5	48.6	37.3	68.9	40.9	39.5	54.5
C	Eastern Project Boundary	June 20, 2008	54.4	48.8	43.9	67.5	47.4	43.8	57.4
		June 21, 2008	52.4	51.0	44.5	69.3	43.6	42.6	55.3
		June 22, 2009	51.6	50.6	43.7	70.2	42.4	41.3	54.2
Short-Term Noise Measurement Sites									
1	285' South of Regional Park	June 18, 2008	--	48.2	38.9	66.1	@ 1:21 p.m.		
2	Eastern Project Boundary near Education Street	Same	--	51.1	47.1	66.2	@ 1:44 p.m.		
3	Southern Project Boundary	Same	--	54.0	50.3	70.4	@ 2:01 p.m.		
4	Western Project Boundary	Same	--	51.4	33.6	67.2	@ 2:22 p.m.		
5	Southern Project Boundary near Bell Street	Same	--	57.4	49.6	75.9	@ 2:38 p.m.		

Source: j.c. brennan & associates, Inc., Timberline at Auburn Environmental Noise Assessment, March 2010.

Roadway	Segment	L _{dn} @ 100 Feet (dB)	Distance to Contours (feet)		
			70 L _{dn}	65 L _{dn}	60 L _{dn}
Quartz Drive	Hwy 49 to Project Site	53.7	8	18	38
Education Street	Hwy 49 to Project Site	55.1	10	22	47
Bell Road	West of Richardson	57.5	15	32	69
Bell Road	Richardson to 1 st Street	59.8	21	45	96
Bell Road	1 st Street to Professional	60.9	25	53	115
Bell Road	Professional to Hwy 49	61.6	28	60	128
Bell Road	Hwy 49 to Quartz Drive	67.1	64	139	298
Bell Road	Quartz Drive to New Airport	66.5	58	126	271
Bell Road	East of New Airport	69.5	93	201	432
Atwood Road	West of Richardson	57.6	15	32	70
Atwood Road	East of Richardson	57.2	14	30	65
Atwood Road	West of Hwy 49	59.8	21	45	98
Richardson Drive	Dry Creek to Park	50.9	5	12	25
Richardson Drive	Bell to Project Site	37.4	1	1	3
Richardson Drive	Bell to Atwood	53.1	7	16	34
Richardson Drive	South of Atwood	46.1	3	6	12
1 st Street	South of Bell	52.4	7	14	31

Note:
Distances to traffic noise contours are measured in feet from the centerlines of the roadways.

Source: Federal Highway Administration, RD-77-108, with inputs from Omni-Means and j.c. brennan & associates, Inc., March 2010.

Aircraft	Number of Events	dB, SEL		
		High	Low	Average
Site A				
Single Engine	5	80.7	68.6	75.1
Helicopter	2	80.1	74.9	77.5
Site B				
Single Engine	4	80.1	63.5	73.3
Helicopter	1	--	--	70.8
Site C				
Single Engine	5	--	61.8	76.2
Helicopter	2	78.0	71.1	74.6
Site 6				
Single Engine	4	82.7	75.3	77.8
Helicopter	1	--	--	76.7

Source: j.c. brennan & associates, Inc., Timberline at Auburn Environmental Noise Assessment, March 2010.

The continuous noise level measurements data shown in Table 9-5 indicate that the 24-hour L_{dn} levels range from 49.4 dB to 54.8 dB $L_{dn}/CNEL$, which are approximately consistent with the existing Auburn Municipal Airport Noise Contours adopted by the City of Auburn in July 2007 (Figure 9-2). Future airport noise contours for the years 2015 and 2025, are displayed in Figures 9-3 and 9-4 respectively. It should be noted that although the City has adopted both of these future airport contours, the County has not yet officially adopted either of them.

**Table 9-5
 Summary of Hourly Noise Monitoring Results on June 20-22, 2008**

Date	$L_{dn}/CNEL$	Daytime (7a.m.-10p.m.)			Nighttime Average (10p.m.-7a.m.)		
		Avg. SEL	Low SEL	High SEL	Avg. SEL	Low SEL	High SEL
Site A							
June 20	54.8	76.4	69.3	82.9	73.8	69.0	79.5
June 21	51.6	76.0	69.1	81.9	77.2	70.9	81.0
June 21	51.3	77.8	69.6	85.2	77.1	--	--
Site B							
June 20	52.4	76.1	69.1	82.0	73.6	69.5	78.9
June 21	49.4	77.4	69.7	81.6	76.4	71.0	78.7
June 22	49.5	77.6	71.0	85.5	75.8	76.4	74.7
Site C							
June 20	54.4	77.7	71.2	83.5	75.7	69.3	81.6
June 21	52.4	79.0	69.1	90.0	71.4	70.3	72.2
June 22	51.6	78.2	69.3	87.4	78.3	72.6	82.0

Source: j.c. brennan & associates, Inc., Timberline at Auburn Environmental Noise Assessment, March 2010.

9.2 REGULATORY SETTING

State Regulations

California Environmental Quality Act

The California Environmental Quality Act (CEQA) Guidelines, Appendix G, indicate that a significant noise impact may occur if a project exposes persons to noise levels in excess of local general plans or noise ordinance standards, or cause a substantial permanent or temporary increase in ambient noise levels.

California State Building Codes

The State Building Code, Title 24, Part 2 of the State of California Code of Regulations establishes uniform minimum noise insulation performance standards to protect persons within new buildings which house people, including hotels, motels, dormitories, apartment houses and dwellings other than single-family dwellings. Title 24 mandates that interior noise levels attributable to exterior sources shall not exceed 45 dB L_{dn} or CNEL in any habitable room.

Figure 9-2
Existing Airport Noise Contours

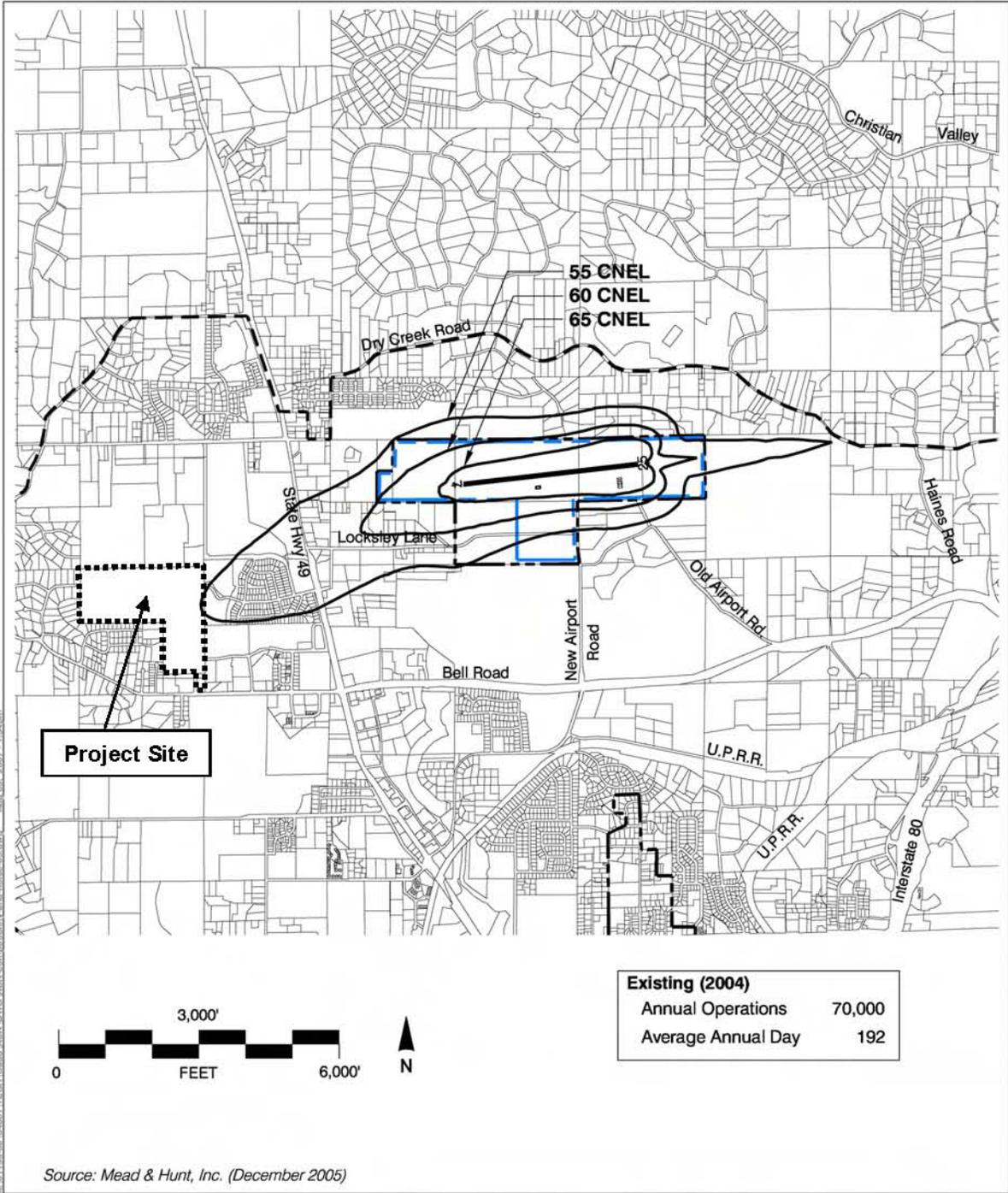


Figure 9-3
2015 Airport Noise Level Contours

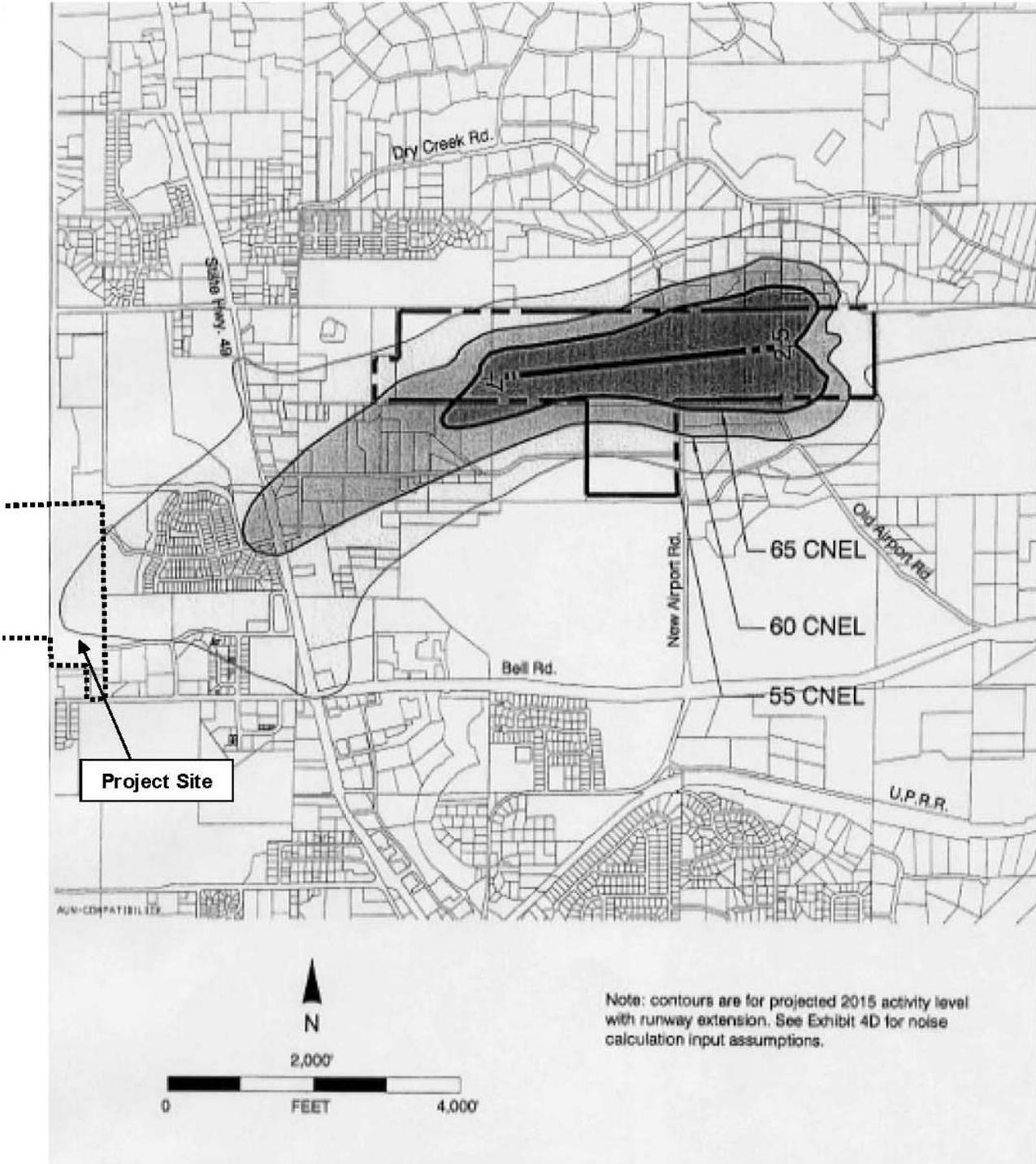
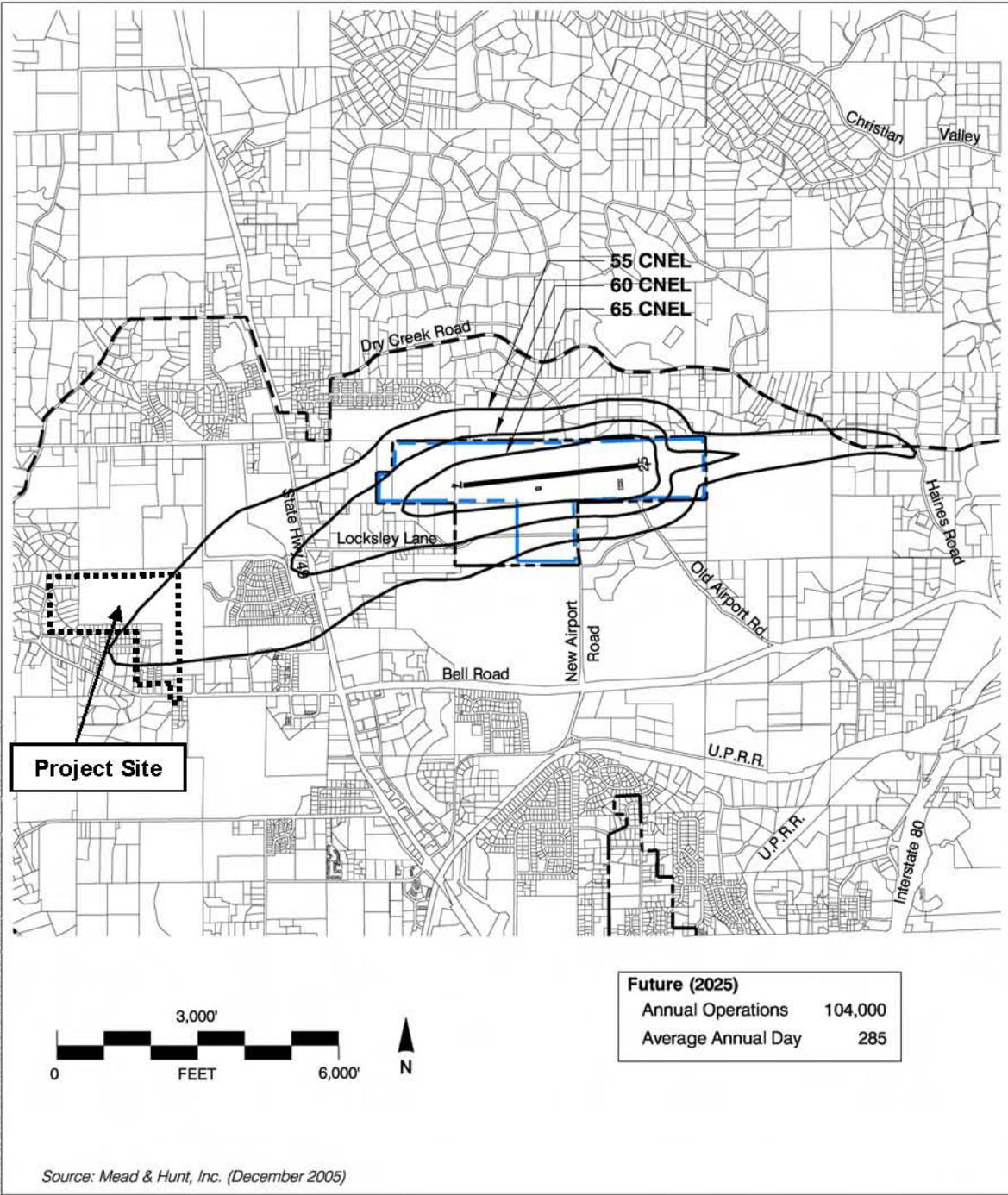


Figure 9-4
2025 Airport Noise Level Contours



Title 24 also mandates that for structures containing noise-sensitive uses to be located where the L_{dn} or CNEL exceeds 60 dB, an acoustical analysis must be prepared to identify mechanisms for limiting exterior noise to the prescribed allowable interior levels (Section 1208A.8.4). If the interior allowable noise levels are met by requiring that windows be kept closed, the design for the structure must also specify a ventilation or air conditioning system to provide a habitable interior environment.

Local Regulations

Auburn/Bowman Community Plan

The project site is located within the Auburn/Bowman Community Plan, which establishes acceptable goals and policies for both transportation and non-transportation noise sources. The following are applicable goals and policies related to the proposed project. Significant noise sources for the Plan area include: traffic on major roadways and highways, railroad operations, airports, and certain industrial activities.

Goal a. To protect community plan area residents from the harmful and annoying effects of exposure to excessive noise.

Goal b. To preserve the rural noise environment of the community plan area and surrounding areas.

Policy a. New development of noise-sensitive uses shall not be allowed where the noise level due to non-transportation noise sources will exceed the noise level standards of Table 14 (Table 9-6 in this document) as measured immediately within the property line of the new development, unless effective noise mitigation measures have been incorporated into the development design to achieve the standards specified in Table 14.

Policy e. New development of noise-sensitive land uses will not be permitted in areas exposed to existing or projected levels of noise from transportation noise sources which exceed the levels specified in Table 16 (Table 9-7 in this document), unless the project design includes effective mitigation measures to reduce noise in outdoor activity areas and interior spaces.

Table 9-6 (Table 14 in Community Plan)		
Noise Level Performance Standards for New Projects Affected by or Including Non-Transportation Sources		
Noise Level Descriptor	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
Hourly Leq, dB	50	45
Maximum level, dB	70	65
<p>Note:</p> <p>Each of the noise levels specified above shall be lowered by five dB for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises. These noise level standards do not apply to residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwellings).</p> <p><i>Source: Placer County, Auburn Bowman Community Plan Noise Element, 1994. p. 100.</i></p>		

Table 9-7 (Table 16 in Community Plan)			
Maximum Allowable Noise Exposure – Transportation Noise Sources			
Land Use	Outdoor Activity Areas¹	Interior Spaces	
	L_{dn}/CNEL, dB	L_{dn}/CNEL, dB	L_{eq}, dB²
Residential	60 ³	45	--
Transient Lodging	60 ³	45	--
Hospitals, Nursing Homes	60 ³	45	--
Theaters, Auditoriums, Music Halls	--	--	35
Churches, Meeting Halls	60 ³	--	40
Office Buildings	60 ³	--	45
Schools, Libraries, Museums	--	--	45
Playgrounds, Neighborhood Parks	70	--	--
<p>Notes:</p> <p>¹ Where the location of outdoor activity areas is unknown, the exterior noise level standard shall be applied to the property line of the receiving land use.</p> <p>² As determined for a typical worst-case hour during periods of use.</p> <p>³ Where it is not possible to reduce noise in outdoor activity areas to 60 dB Ldn/CNEL or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB Ldn/CNEL may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table. For properties affected by transportation noise from I-80 or railroad tracks, this maximum level shall be 70 dB Ldn/CNEL, provided that interior levels are in compliance with this table.</p> <p><i>Source: Auburn Bowman Community Plan, Noise Element, 1994. p. 102.</i></p>			

Placer County Airport Land Use Compatibility Plan

Chapter 2 of the Placer County Airport Land Use Compatibility Plan (ALUCP) contains Countywide policies that pertain to residential dwellings within areas affected by an airport. Below are the ALUCP policies regarding noise impacts and Figure 9-5 illustrates the land use compatibility table taken from the ALUCP.

- Policy 4.1.3 Noise Exposure in Residential Areas – The maximum CNEL considered normally acceptable for residential uses in the vicinity of the airports covered by this Plan is 60 dB.
- Policy 4.1.5 Interior Noise Levels – Land uses for which interior activities may be easily disrupted by noise shall be required to comply with the following interior noise level criteria:
- a. The maximum, aircraft-related, interior noise level which shall be considered acceptable for land uses near airports is 45 dB CNEL in:
 - a) Living and sleeping areas of single- or multi-family residences;
 - b) Hotels and motels;
 - c) Hospitals and nursing homes;
 - d) Churches, meeting halls, office buildings, and mortuaries; and
 - e) Schools, libraries, and museums.
 - b. The noise contours depicted in Chapters 4, 5, and 6 of this Plan shall be used in calculating compliance with these criteria. Also, the calculations should assume that windows are closed. (Note: Noise contours are shown later in this document).
 - c. When reviewed as part of a general plan or zoning ordinance amendment or as a major land use action, evidence that proposed structures will be designed to comply with these criteria shall be submitted to the ALUC under the following circumstances:

**Figure 9-5
 Placer County Airport Noise Compatibility Criteria**

Countywide Policies / Chapter 2

Land Use Category	CNEL (dB)				
	50-55	55-60	60-65	65-70	70-75
<i>Residential</i>					
single-family, nursing homes, mobile homes	++	+	-	--	--
multi-family, apartments, condominiums	++	+	o	--	--
<i>Public</i>					
schools, libraries, hospitals	+	o	-	--	--
churches, auditoriums, concert halls	+	o	o	-	--
transportation, parking, cemeteries	++	++	++	+	o
<i>Commercial and Industrial</i>					
offices, retail trade	++	+	o	o	-
service commercial, wholesale trade, warehousing, light industrial	++	++	+	o	o
general manufacturing, utilities, extractive industry	++	++	++	+	+
<i>Agricultural and Recreational</i>					
cropland	++	++	++	++	+
livestock breeding	++	+	o	o	-
parks, playgrounds, zoos	++	+	+	o	-
golf courses, riding stables, water recreation	++	++	+	o	o
outdoor spectator sports	++	+	+	o	-
amphitheaters	+	o	-	--	--

Land Use Acceptability	Interpretation/Comments
++ <i>Clearly Acceptable</i>	The activities associated with the specified land use can be carried out with essentially no interference from the noise exposure.
+ <i>Normally Acceptable</i>	Noise is a factor to be considered in that slight interference with outdoor activities may occur. Conventional construction methods will eliminate most noise intrusions upon indoor activities.
o <i>Marginally Acceptable</i>	The indicated noise exposure will cause moderate interference with outdoor activities and with indoor activities when windows are open. The land use is acceptable on the conditions that outdoor activities are minimal and construction features which provide sufficient noise attenuation are used (e.g., installation of air conditioning so that windows can be kept closed). Under other circumstances, the land use should be discouraged.
- <i>Normally Unacceptable</i>	Noise will create substantial interference with both outdoor and indoor activities. Noise intrusion upon indoor activities can be mitigated by requiring special noise insulation construction. Land uses which have conventionally constructed structures and/or involve outdoor activities which would be disrupted by noise should generally be avoided.
-- <i>Clearly Unacceptable</i>	Unacceptable noise intrusion upon land use activities will occur. Adequate structural noise insulation is not practical under most circumstances. The indicated land use should be avoided unless strong overriding factors prevail and it should be prohibited if outdoor activities are involved.

Source: Shutt Moen Associates (October 25, 2000)

Table 2B

**Noise Compatibility Criteria
 Placer County Airport Land Use Compatibility Plan**

- a) Any mobile home situated within an airport’s 55 dB CNEL contour. [A typical mobile home has an exterior-to-interior noise level reduction (NLR) of approximately 15 dB with windows closed].
- b) Any single- or multi-family residence situated within an airport’s 60 dB CNEL contour. [wood frame buildings constructed to meet 1990’s standards for energy efficiency typically have an NLR of approximately 20 dB with windows closed].
- c) Any hotel or motel, hospital or nursing home, church, meeting hall, office building, mortuary, school, library, or museum situated within an airport’s 65 dB CNEL contour.

Placer County Noise Ordinance

The Placer County Code, Section 9.36.060 establishes sound limits for sensitive receptors, as shown in Table 9-8. The standards are measures at the property line of the receiving sensitive receptor.

Section 9.36.020 of the code defines a sensitive receptor as “a land use in which there is a reasonable degree of sensitivity to noise. Such uses include single-family and multi-family residential uses, frequently used outbuildings, schools, hospitals, churches, rest homes, cemeteries, public libraries and other sensitive uses as determined by the enforcement officer.” The purpose of the Noise Ordinance is to implement the Noise Standards identified in the *Placer County General Plan* and the *Auburn Bowman Community Plan*. The County Noise Ordinance is enforced with the Penal Code to establish standards for reported nuisance abatement and enforcement within the County.

The Table 9-8 criteria are based upon hourly average (L_{eq}) and maximum (L_{max}) noise level descriptors. These noise level descriptors have been found to provide good correlation to stationary noise sources such as those associated with the proposed project.

Table 9-8		
Hourly Exterior Noise Performance Standards for Stationary (Non-Transportation) Noise Sources		
Noise Metric	Acceptable Noise Level, dBA	
	Daytime (7 a.m. – 10 p.m.)	Nighttime (10 p.m. – 7 a.m.)
Leq	55	45
Lmax	70	65

9.3 IMPACTS AND MITIGATION MEASURES

Standards of Significance

The CEQA Guidelines, along with Placer County, define a significant adverse impact on the environment if the project would result in:

- Exposure of persons to or generation of noise levels in excess of standards established in the Placer County General Plan Noise Element;
- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project, typically defined as 4dB;
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above existing levels without the project, typically defined as 4dB;
- For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, where the project would expose people residing or working in the project area to excessive noise levels; or
- For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels.

It should be noted that the proposed project is not predicted to generate significant amounts of groundborne vibrations or noise; therefore, the second significance criteria is not further evaluated within this chapter.

Method of Analysis

Traffic Noise Impact Assessment Methodology

To assess noise impacts due to project-related traffic increases on the local roadway network, traffic noise levels are predicted at a representative distance for short-term and future project, and no-project conditions for the proposed project. Noise impacts are identified at existing noise-sensitive areas if the noise levels generated by the project create a significant increase in existing noise levels. In addition, impacts to project-related noise-sensitive uses are examined to ensure that local noise standards are not exceeded for new development.

To describe existing and projected future noise levels due to traffic, the Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA RD-77-108) was used. The FHWA model is the analytical method currently favored for highway traffic noise prediction by most state and local agencies, including the California Department of Transportation (Caltrans).

The sound level meters used to measure the existing ambient daytime noise levels were programmed to record the maximum (L_{max}), median (L_{50}), and average (L_{eq}) noise levels at each site during the survey. The Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meters were used for the ambient noise level measurements. The meters were calibrated before and after use

with an LDL Model CAL2000 acoustical calibrator to ensure the accuracy of the measurements. The aforementioned sound meters meet the American National Standards Institute for Type 1 sound level meters.

To determine the existing traffic noise levels at the identified sensitive receivers within the project vicinity, the Federal Highway Administration's Highway Traffic Noise Prediction Model (FHWA-RD-77-108) was used with the California Vehicle Noise Emission Levels. The FHWA model is based upon the Calveno reference noise factors for automobiles, medium and heavy trucks, with consideration given to traffic volume, speed, roadway configuration, distance to receiver, and the acoustical characteristics of the site. Traffic volumes were obtained from 2010 Omni-Means Traffic Study prepared for the proposed project. Field observations were the basis of truck usage and vehicle speeds.

Construction noise was analyzed using data compiled for the various types of construction equipment at a representative distance of 50 feet. Construction activities are discussed relative to the applicable noise policies contained within the Placer County General Plan. Aviation noise is addressed through a combination of short-term and continuous site noise measurements of aircraft operations and a review of the applicable ALUCP policies discussed above.

As stated earlier, those CEQA thresholds identified as *potentially significant* within the IS are addressed below. All other CEQA thresholds listed above have already been addressed and identified as having *no impact*, a *less-than-significant* impact, or include mitigation measure(s) to reduce the proposed project's potential for an adverse impact to a *less-than-significant* level within the Initial Study.

Project-Specific Impacts and Mitigation Measures

9-1 Impacts from construction would temporarily increase noise levels during construction.

Noise from construction activities would add to the existing noise environment of the project site and immediate vicinity. Sensitive receptors would include the adjacent single-family residences located to the north, south, and west, multi-family residential complexes to the east (along Richardson Drive), and healthcare facilities to the south. The nearest sensitive receptor that could be exposed to construction-related noise would be approximately 50 feet away from the project boundaries. According to the FHWA's *Roadway Construction Noise Model User's Guide*, construction activities would generate maximum noise level ranges between 76 dB to 90 dB at a distance of 50 feet (See Table 9-9). Temporary activities on-site include, but are not limited to, lumber milling and rock crushing. It should be noted that the lumber milling and rock crushing would occur in the central area of the project site so as to minimize the amount of short-term construction noise exposure to adjacent residences. However, construction activities would be temporary and are anticipated to occur during normal daytime working hours per the County Noise Ordinance.

Table 9-9 Construction Equipment Noise	
Type of Equipment	(L_{max}) (distance of 50 feet)
Backhoe	78
Compactor	83
Compressor (Air)	78
Concrete Saw	90
Dozer	82
Dump Truck	76
Excavator	81
Generator	81
Jackhammer	89
Pneumatic Tools	85

Source: Roadway Construction Noise Model User's Guide, Federal Highway Administration, FHWA-HEP-05-054.

In addition, noise would be generated by increased truck traffic on area roadways during the construction phase. A significant project-generated noise source would be truck traffic associated with the transport of equipment and materials to and from the project site. Construction activities are conditionally exempt from the Placer County Noise Ordinance during the following operating hours: from 6 a.m. to 8 p.m., Monday through Friday, and from 8 a.m. to 8 p.m. on Saturdays and Sundays.

Despite this exemption, sensitive receptors immediately surrounding the project site could be exposed to high levels of noise during the daytime construction hours. Therefore, short-term construction noise remains a **potentially significant** impact to nearby sensitive receptors located adjacent to the project site.

Mitigation Measure(s)

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

- 9-1(a) *Construction activities shall comply with the Placer County Noise Ordinance.*
- 9-1(b) *Fixed construction equipment, which may include, but not be limited to, compressors and generators, shall be located as far away from sensitive receptors, to the extent feasible. In addition, impact tools shall be shielded or shrouded. Intake and exhaust ports of powered construction equipment shall also be muffled or shielded.*
- 9-1(c) *A disturbance coordinator shall be appointed for the project site who would receive any public noise-related complaints about construction equipment and practices. The disturbance coordinator shall be responsible for determining the cause of the complaint(s) and the implementation of any feasible measures to alleviate the complaint(s). The disturbance*

coordinator's contact information shall be posted throughout the site and adjacent public spaces.

9-2 Traffic-related noise impacts as a result of project implementation.

Omni-Means Transportation Engineers conducted a traffic study for the proposed project. Traffic volumes for p.m. peak hour traffic were compiled into segment volumes and then converted into daily traffic volumes (by using a factor of 10). Estimated truck usage and vehicle speeds were estimated from field observations. Table 9-10 shows the predicted traffic noise level on the local roadway network for existing conditions and existing plus phase 1 and 2 of the project. Predicted short-term and short-term plus phase 1 and 2 traffic noise level increases for the local roadway network is shown in Table 9-11 and the cumulative traffic noise level increases are shown in Table 9-12 (cumulative year 2030).

As shown in Tables 9-10 and 9-12, the project-related traffic noise increases for all roadway segments would be below the 4 dB threshold, with the exception of Richardson Boulevard between Bell Road and the project site. Although the predicted change increase would be approximately 17.7 dB and exceed the 4 dB threshold, the overall existing and short-term noise level with phase 1 and 2 of the project would be at a level of 55.1 dB. The segment of Richardson Drive, between Bell Road and the project site does not include any residential sensitive receptors immediately adjacent to this segment. However, two care centers are located immediately to the west and east of this segment of Richardson Drive. The Foothill Oaks Care Center is located along the west side of the aforementioned roadway segment and would be approximately 460 feet from any operational activities, while the Siena Care Center is approximately 470 feet to the east of the roadway segment.

The predicted noise level change for the segment of Richardson Drive, between Bell Road and the project site is from a distance of 100 feet from the centerline of Richardson Drive. The nearest sensitive receptors would be located well outside of this range. Therefore, this increase in traffic noise levels is considered to be *less-than-significant* and mitigation would not be required.

Mitigation Measure(s)

None required.

**Table 9-10
 Predicted Traffic Noise Levels and Project-Related Noise Increases**

Roadway	Segment	Noise Levels (L_{dn} , dB), 100 Feet from Centerline ¹		
		Existing (dB)	Existing + Phase 1 & 2 (dB)	Change (dB)
Quartz Drive	Hwy 49 to Project Site	53.7	53.7	0.0
Education Street	Hwy 49 to Project Site	55.1	55.6	0.5
Bell Road	West of Richardson	57.5	57.8	0.3
Bell Road	Richardson to 1st	59.8	60.5	0.7
Bell Road	1st to Professional	60.9	61.8	0.9
Bell Road	Professional to Hwy 49	61.6	62.4	0.8
Bell Road	Hwy 49 to Quartz	67.1	67.2	0.1
Bell Road	Quartz to New Airport	66.5	66.6	0.1
Bell Road	East of New Airport	69.5	69.6	0.1
Atwood Road	West of Richardson	57.6	57.8	0.2
Atwood Road	East of Richardson	57.2	57.2	0.0
Atwood Road	West of Hwy 49	59.8	59.8	0.0
Richardson Drive	Dry Creek to Park	50.9	50.9	0.0
Richardson Drive	Bell to Project Site	37.4	55.1	17.7
Richardson Drive	Bell to Atwood	53.1	53.4	0.3
Richardson Drive	South of Atwood	46.1	46.6	0.5
1 st Street	South of Bell	52.4	52.7	0.3

Notes:

¹ Distances to traffic noise contours are measures in feet from the centerlines of the roadways.

² Traffic noise levels do not account for shielding from existing noise barriers or intervening structures. Traffic noise levels may vary depending on actual setback distances and localized shielding.

Bold indicates noise levels exceeding Placer County standards.

Source: j.c. brennan & associates, Inc., Timberline at Auburn Environmental Noise Assessment, March 2010.

**Table 9-11
 Predicted Traffic Noise Levels and Project-Related Noise Increases**

Roadway	Segment	Noise Levels (L_{dn} , dB), 100 Feet from Centerline ¹		
		Short-Term (dB)	Short-Term + Phase 1 & 2 (dB)	Change (dB)
Quartz Drive	Hwy 49 to Project Site	53.8	53.8	0.0
Education Street	Hwy 49 to Project Site	55.0	55.5	0.5
Bell Road	West of Richardson	57.6	57.8	0.2
Bell Road	Richardson to 1st	60.7	61.4	0.7
Bell Road	1st to Professional	61.7	62.5	0.8
Bell Road	Professional to Hwy 49	62.1	62.8	0.7
Bell Road	Hwy 49 to Quartz	68.0	68.1	0.1
Bell Road	Quartz to New Airport	67.3	67.4	0.1
Bell Road	East of New Airport	70.0	70.1	0.1
Atwood Road	West of Richardson	59.1	59.2	0.1
Atwood Road	East of Richardson	58.5	58.5	0.0
Atwood Road	West of Hwy 49	60.6	60.6	0.0
Richardson Drive	Dry Creek to Park	50.9	50.9	0.0
Richardson Drive	Bell to Project Site	37.4	55.1	17.7
Richardson Drive	Bell to Atwood	53.6	53.8	0.2
Richardson Drive	South of Atwood	46.8	47.2	0.4

Notes:

¹ Distances to traffic noise contours are measures in feet from the centerlines of the roadways.

² Traffic noise levels do not account for shielding from existing noise barriers or intervening structures. Traffic noise levels may vary depending on actual setback distances and localized shielding.

Bold indicates noise levels exceeding Placer County standards.

Source: j.c. brennan & associates, Inc., Timberline at Auburn Environmental Noise Assessment, March 2010.

**Table 9-12
 Cumulative (2030) Noise Levels with and without Project**

Roadway	Segment	Noise Levels (L _{dn} , dB), 100 Feet from Centerline			Distance to Traffic Noise Contour (feet) ¹		
		Cumulative (dB)	Cumulative +Project(dB)	Change (dB)	70 dB L _{dn}	65 dB L _{dn}	60 dB L _{dn}
Quartz Drive	Hwy 49 to Project Site	54.3	54.8	0.5	10	21	45
Education Street	Hwy 49 to Project Site	58.0	58.8	0.8	18	38	83
Bell Road	West of Richardson	60.6	60.9	0.3	25	53	115
	Richardson to 1st	61.8	63.5	1.7	37	79	171
	1st to Professional	62.5	63.9	1.4	39	84	181
	Professional to Hwy 49	63.2	64.4	1.2	42	91	196
	Hwy 49 to Quartz	67.3	67.6	0.3	69	149	321
	Quartz to New Airport	68.6	68.7	0.1	82	177	380
Atwood Road	East of New Airport	71.3	71.4	0.1	124	267	576
	West of Richardson	59.3	59.6	0.3	20	44	94
	East of Richardson	59.3	59.3	0.0	19	42	90
Richardson Drive	West of Hwy 49	61.1	61.1	0.0	26	55	119
	Dry Creek to Park	54.2	55.9	1.7	11	25	53
	Bell to Project Site	55.0	60.2	5.2	22	48	103
	Bell to Atwood	54.9	55.4	0.5	11	23	49
1 st Street	South of Atwood	50.7	51.0	0.3	5	12	25
	South of Bell	53.7	54.1	0.4	9	19	40
Richardson Drive	Bell to Education	NA	60.1	NA	22	47	101
	Education to Project Main Entrance	NA	59.2	NA	19	41	89
	Project Main Entrance to Quartz	NA	57.7	NA	15	33	71
	Quartz to Dry Creek	NA	56.6	NA	13	27	59

Notes:

¹Traffic noise levels do not account for shielding from existing noise barriers or intervening structures.

Source: j.c. brennan & associates, Inc., Timberline at Auburn Environmental Noise Assessment, March 2010.

9-3 Potential impacts from on-site noise sources to existing sensitive receptors.

Project operations could expose existing nearby sensitive receptors to on-site noise levels that exceed applicable noise standards. Sensitive receptors include the single-family residences to the north, south, and west; multi-family residences to the east, and healthcare facilities to the south, would be located approximately 50 feet away from the project site. The closest sensitive receptors would be the single-family residences adjacent to the project site. On-site activities/sources that have the potential to exceed Placer County noise standards include: truck circulation, loading dock activities, parking lot activities, heating ventilation and air conditioning (HVAC) mechanical equipment, and recreational activities. Each of these activities is discussed and analyzed below for their potential noise impact(s) to existing sensitive receptors in the project vicinity.

Truck Circulation Noise

To determine noise levels associated with trucks circulating on the project site combined with loading dock activities, j.c. brennan & associates, Inc. collected noise level data associated with the project site and vicinity. The proposed project would include a truck loading bay along the proposed 2-story “Commons Building,” located towards the central area of the site. Truck circulation to and from the loading bay would occur within an approximate distance of 220 feet from existing sensitive receptors (residential properties). The project applicant anticipated approximately two to four semi-trucks and six to eight vendor trucks would access the loading dock on a daily basis.

Although brief, truck pass-bys to and from the loading bay would be expected to generate an average Sound Exposure Level (SEL) of approximately 84 dB, at a distance of 50 feet. The typical L_{max} level of a truck pass-by at 50 feet is 76 dB. The L_{eq} (hourly average) for truck pass-bys was calculated from the following equation, where the number of events is assumed to be one truck arrival and departure per hour and the log of the number of seconds in an hour is 35.6. It should be noted that the distance from the closest sensitive receptor to the proposed loading bay is 120 feet and must be adjusted in order to calculate the noise level for truck pass-bys.

$$L_{eq} = SEL + 10 * \log(\# \text{ of events}) - 35.6$$

Based upon the above equation, peak hour truck circulation would result in an hourly noise level of 57.4 dB L_{eq} at a distance of 50 feet. The calculated noise level must also be adjusted to a distance of 220 feet to account for the distance to the nearest existing residential property line.

The calculated L_{eq} at the nearest residential property line is 48 dB L_{eq} and the maximum level is 64 dB L_{max} . These noise levels do not account for any shielding from intervening buildings. Accounting for shielding from the proposed Building J1, the truck circulation noise levels are predicted to be approximately 3 dB less or 45 dB L_{eq} and 61 dB L_{max} .

Based upon the results of the calculated L_{eq} and L_{max} , the truck circulation noise from the proposed project, 45 dB L_{eq} , would comply with the County's 50 dB L_{eq} daytime exterior noise level standard. The predicted 61 dB L_{max} truck circulation would comply with the County's daytime exterior L_{max} standards of 70 dB L_{max} . Truck circulation noise impacts are considered to be *less-than-significant*. However, the below mitigation measures required for on-site noise sources that would create potentially significant impacts would serve to indirectly further reduce any potential truck circulation noise impacts.

Loading Dock Noise

To determine potential loading dock noise levels associated with the proposed project, the technical noise assessment (See Appendix V) utilized representative noise level measurements for various loading docks in the Sacramento region and applied them to the project site and vicinity. The results of the noise measurement analysis indicated that a maximum level of 82 dB L_{max} would be generated from on-site loading activities during a "busy hour," at a distance of 50 feet. The results also indicated that the average noise level from loading dock activities would be 63 dB L_{eq} , at a distance of 50 feet.

Noise generating activities associated with loading docks typically include engine noise (start up and stopping), air brakes, uploading/offloading activities, and idling engines. As with the aforementioned truck circulation noise, loading dock activities were determined not to qualify for the 5 dB penalty from the County [Appendix C of the noise assessment conducted by j.c. brennan & associates, Inc. (See Appendix V)].

The proposed loading docks would be located approximately 250 feet from the nearest existing sensitive receptors, which are located to the southern border of the project site. At a distance of 250 feet, the predicted loading dock noise exposure, not accounting for any shielding from an intervening building(s), is 49 dB L_{eq} and 68 dB L_{max} . Accounting for the on-site building (Building J1), the predicted loading dock noise exposures to nearby sensitive receptors are 46 dB L_{eq} and 65 dB L_{max} .

The predicted 46 dB L_{eq} loading dock noise exposure would comply with the County's 50 dB L_{eq} daytime exterior noise exposure.

The predicted 65 dB L_{max} noise level would comply with the County's 70 dB L_{max} daytime exterior noise level standards *less-than-significant*. However, the below mitigation measures required for on-site noise sources that would create potentially significant impacts would serve to indirectly further reduce any potential loading dock noise impacts.

Recreational Noise Impacts

The proposed project would include the construction and operation of an on-site tennis court, located north of Buildings C1-C6 in the central recreational area of the site. The nearest sensitive receptors to the tennis courts would be approximately 220 feet, along the northern site boundary. The predominant noise source associated with the tennis

court would be patrons talking and/or shouting, plus the sound of racquets and tennis balls.

Hourly noise levels associated with tennis courts are 58 dB L_{eq} and 75 dB L_{max} at a distance of 50 feet. At a distance of 220 feet, the predicted hourly noise levels for the sensitive receptors from tennis court activity are 45 and 62 dB L_{eq} and L_{max} , respectively. Both the average and maximum noise levels are anticipated to comply with the County's 50 dB L_{eq} and 70 dB L_{max} daytime noise level standards and 45 dB L_{eq} and 65 dB L_{max} nighttime noise level standard, resulting in a *less-than-significant* impact.

Central Plant and HVAC-Related Noise

The proposed project would include a central plant, which would house the HVAC "chillers" for the multi-story Independent Living and Assisted Living residential buildings. The Central Plant would contain multiple "chillers" for redundancy and the possibility of future expansion. Constructed of concrete blocks, the Central Plant would not have roof- or ground-mounted cooling towers, but would include approximately four 50-lb washers and four 75-lb gas dryers. Emergency generators would be located outside of the Central Plant in a separate yard enclosed by a concrete block wall, which would also house a trash compactor. The generators would have an approximate capacity of 600 kW/750 kVA. The mechanical schematics of the Central Plant are not available at this time; however, it is anticipated that the Central Plant would require ventilation openings for air circulation. Therefore, mechanical noise would be emitted from the Central Plant activities and possibly impact nearby sensitive receptors, which is a *potentially significant* impact. Mitigation would be required to reduce the overall noise impact related to the Central Plant operations.

When operated under emergency situations, emergency generators are typically exempt from the County's exterior noise level standards. However, routine maintenance of the generators would not be considered exempt from County standards. Additionally, diesel generators are usually not mitigated by a concrete wall. Therefore, potential operational noise from Central Plant activities could result in *potentially significant* impacts. Mitigation would be required to reduce the potentially significant noise impacts associated to the on-site generators.

Parking Lot Noise

Typical noise in parking lots include conversations, doors closing, engines running and idling, and vehicles braking. File data from j.c. brennan & associates, Inc. was used to model the parking lot noise environment for the proposed project. A representative 71 dB SEL, at a distance of 50 feet, was used to represent parking lot activity noise. The p.m. peak hour project trip volumes for the proposed project were provided by Omni-Means Transportation Engineers. Potential parking lot noise is discussed below in general terms of the location of parking areas on the project site.

Parking Lot Areas H1-H3

The p.m. peak hour trip generation rates for the medical offices H1-H5 are 312 trips. Noise values were predicted by the following calculation, assuming that approximately half of the trips are associated with the parking lots east of the Buildings H1-H3. Note that the mean of the event is represented by SEL, L_{eq} is the sum of the number of hourly events (156 trips), and 35.6 is ten times the log of the number of seconds in an hour.

$$L_{eq} = SEL + 10 \text{ LOG } L_{eq} - 35.6$$

Based upon this calculation, the predicted noise level is 57 dB L_{eq} at a reference distance of 50 feet. The nearest sensitive receptor is located approximately 75 feet east of the center of the parking lot. Adjusting for this distance, the peak hour L_{eq} is approximately 54 dB L_{eq} . This level would exceed the County's 50 dB L_{eq} exterior daytime standard and is considered *potentially significant*. Peak hour parking lot activity is not expected during nighttime hours; therefore, the County's 45 dB L_{eq} exterior noise level standard is not exceeded.

Parking lot activities typically have an L_{max} of 63 dB L_{max} at a distance of 50 feet. The closest parking spaces are approximately 15 feet from the nearest sensitive receptors. At the 15 feet distance, the predicted parking lot noise level is 74 dB L_{max} , which would exceed the County's 70 dB L_{max} daytime and the 65 dB L_{max} nighttime exterior noise level standards. This is a *potentially significant* impact and would require mitigation measures discussed below to reduce the overall impact associated with parking lot areas H1-H3.

Commercial Recreational/Fitness Parking Lot Areas

The peak hour noise level, L_{eq} , was generated by using the same aforementioned formula. For the Commercial Recreational/Fitness Parking lot areas, the traffic study determined a p.m. peak hour generation of 159 trips. The predicted noise level due to parking lot activity is 57 dB L_{eq} at a reference distance of 50 feet. However, the closest sensitive receptor to this area of the project site is approximately 300 feet to the eastern boundary line. The adjusted peak hour L_{eq} for this distance is approximately 42 dB L_{eq} . The predicted 42 dB L_{eq} parking lot noise level would comply with the County's daytime standard of 50 dB L_{eq} and nighttime standard of 45 dB L_{eq} .

The centers of the closest parking spaces are approximately 200 feet from the nearest sensitive receptors and would have a predicted maximum noise level of 51 dB L_{max} . The predicted maximum noise level would comply with both the daytime and nighttime standards of the County; therefore, potential noise impacts from the Commercial Recreational/Fitness Parking lots are considered to be *less-than-significant*.

A summary of the predicted noise levels due to on-site activities is presented in Table 9-13.

<p>Table 9-13 Predicted Project-Related Noise Levels with Varying Noise Barrier Heights</p>
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Noise Source	Direction of Nearest Residential Property Line	Predicted Peak Hour Noise Levels		Placer County Noise Standards	
		Unmitigated Noise Level	Wall Height – Noise Level, (dB L _{eq} / dB L _{max} ¹)	Daytime (7a.m. to 10p.m.)	Nighttime (10p.m. to 7a.m.)
Truck Circulation	West	45 dB L _{eq} 61 dB L _{max}	N/A	50 dB L _{eq} 70 dB L _{max}	45 dB L _{eq} 65 dB L _{max}
Loading Dock	West	46 dB L _{eq} 65 dB L _{max}	N/A	50 dB L _{eq} 70 dB L _{max}	45 dB L _{eq} 65 dB L _{max}
Tennis Court	North	45 dB L _{eq} 62 dB L _{max}	N/A	50 dB L _{eq} 70 dB L _{max}	45 dB L _{eq} 65 dB L _{max}
H1-H3 Parking Lot	East	54 dB L_{eq} 74 dB L_{max}	6' - 44dB L _{eq} / 62 dB L _{max}	50 dB L _{eq} 70 dB L _{max}	45 dB L _{eq} 65 dB L _{max}
Rec/Fitness Parking Lot		42 dB L _{eq} 51 dB L _{max}	N/A	50 dB L _{eq} 70 dB L _{max}	45 dB L _{eq} 65 dB L _{max}

Notes:

¹ Noise reductions apply to first-floor locations only.

Bold indicates noise levels exceeding Placer County standards.

Source: j.c. brennan & associates, Inc., Timberline at Auburn Environmental Noise Assessment, March 2010.

The operation of the on-site features of the proposed project discussed above would result in significant increases in noise levels derived from activities associated with the loading docks, tennis courts, central plant and emergency generators, and parking lots H1-H3. The predicted noise levels related to truck circulation, loading docks, recreational, and commercial recreational/fitness parking lot area noise would comply with County noise standards and a *less-than-significant* impact would result. The predicted increases to the existing noise levels related to Central Plant and HVAC, parking lot, and commercial parking lot noise would exceed County noise standards and are considered *potentially significant* impacts.

Mitigation Measure(s)

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

- 9-3(a) *Loading and delivery activities shall be limited to daytime hours 7:00 AM to 10:00 PM.*

- 9-3(b) *Prior to Improvement Plan approval, a noise barrier shall be shown along the south and east boundaries of the project site to reduce impacts to affected sensitive receptors from increased parking lot noise levels determined in this DEIR (shown conceptually in Figure 9-6), for the review and approval by the Planning Department. A noise barrier six feet in height would be required (minimum) along the south and eastern property boundaries, lots 26, 27, and 28, to reduce future parking lot noise levels below the Placer County Standards. Barriers could take the form of earth berms, solid walls, or a combination of the two. Appropriate materials for noise walls include precast concrete or masonry block. Other materials may be acceptable provided they have a density of approximately four pounds per square foot.*
- 9-3(c) *Prior to Improvement Plan approval, the project applicant shall be responsible for designing the Central Plant to minimize the ventilation openings facing nearby residences along the project site boundaries. Any openings in the building façade shall require treatment with acoustical silencers/louvers. Additionally, any rooftop ventilation openings or stacks shall be shielded from view with building parapets and may also require treatment with acoustical silencers/louvers. The noise emitted from the mechanical equipment within the Central Plant must comply with the Placer County exterior noise standards (45 dB L_{eq} and 65 dB L_{max} respectively) at the nearest sensitive receptors.*
- 9-3(d) *The emergency backup generator(s) shall be installed with an acoustical enclosure and engine muffler which could reduce noise levels to compliance with the Placer County standards (50 dB L_{eq} daytime exterior noise level standard) at the nearest sensitive receptor.*

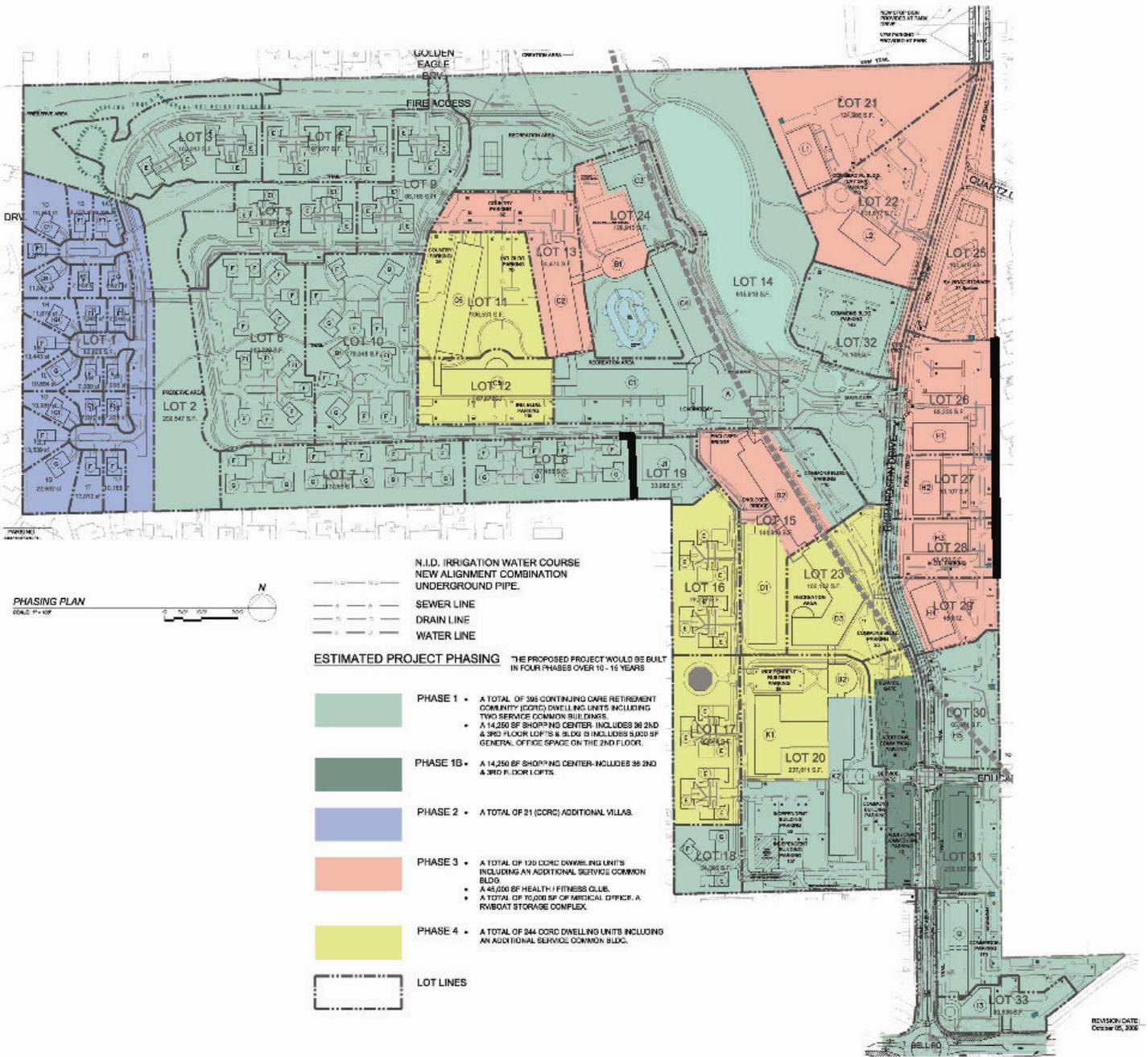
9-4 Potential impacts from project implementation to new on-site sensitive receptors.

Project operations could expose new on-site receptors to on-site noise levels that exceed applicable noise standards. On-site activities/sources that have the potential to exceed Placer County noise standards include: truck circulation, loading dock activities, parking lot activities, heating ventilation and air conditioning (HVAC) mechanical equipment, and recreational activities. Each of these activities is discussed and analyzed below for their potential noise impact(s) to existing sensitive receptors in the project vicinity.

Truck Circulation Noise

The proposed project would include a truck loading bay along the proposed two-story “Commons Building,” located towards the central area of the site. Truck circulation to and from the loading bay would occur within an approximate distance of 200 feet north of the proposed truck circulation route between buildings C1 and C2.

**Figure 9-6
 Potential On-Site Soundwall Locations**



: Potential Sound Wall Locations

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As discussed earlier, the predicted L_{eq} for truck circulation is 57.4 dB at a distance of 50 feet from the truck circulation route. The maximum level is 76 dB L_{max} at 50 feet. At a distance of 200 feet, truck circulation noise levels are predicted to be 48.4 dB L_{eq} and 64.0 dB L_{max} . The predicted 48 dB L_{eq} truck circulation noise level would comply with the Placer County 50 dB L_{eq} daytime exterior noise level standard. The predicted 64 dB L_{max} truck circulation noise level would comply with the Placer County daytime 70 dB L_{max} daytime exterior noise level standard.

Based upon the one-third octave band graph shown in Appendix C of Appendix V of this DEIR, truck circulation noise levels are not believed to consist of “simple tones” nor recurring impulsive noises and the County’s 5 dB penalty would not be applied to truck circulation noise levels. Therefore, the truck and circulation noise impacts to new on-site sensitive receptors would be considered *less-than-significant*.

Loading Dock Noise

The proposed project includes a loading bay on the west side of Building A “2-Story Commons Building.” The loading bay would be located approximately 60 feet from the property line of Lot 15, which includes residential Building D2 “3-story Residential Independent Living.”

As discussed earlier, the predicted L_{eq} for loading docks is 63 dB at a distance of 50 feet from the loading dock. The maximum noise level at 50 feet is 82 dB L_{max} . At 60 feet, exterior noise levels would be 61 dB L_{eq} and 81 dB L_{max} . These noise levels would exceed the exterior noise level limits of the Auburn Bowman Community Plan and Section 9.36.060 of the Placer County Noise Ordinance, which require the noise level standard to be applied to the property line of the receiving land use.

Lot 15 does not have exterior noise sensitive areas at the property line nor outdoor sensitive locations. Sensitive outdoor locations includes an outdoor recreational area, located 100-350 feet north of the loading dock that is shielded from view by intervening buildings. At a distance of 100 feet, accounting for shielding from the intervening buildings, the loading dock noise levels are predicted to be 47 dB L_{eq} and 66 dB L_{max} . Therefore, noise levels would be within acceptable limits. As a result, the proposed project would not result in any physical noise impacts to sensitive receptors at Lot 15; however, the project would conflict with the existing Noise Ordinance policy language.

The project includes an entitlement requiring Placer County approval (See Chapter 3 of the DEIR, Project Description) for an exception to the Placer County property line exterior noise level standard. Upon County approval of the requested exception, an inconsistency would not occur as a result of the proposed project.

Interior residential areas located at Building D2, on Lot 15, could be affected by adjacent loading dock activities. The distance from the loading dock to the D2 building façade is approximately 160 feet. At 160 feet, exterior noise levels are predicted to be approximately 53 dB L_{eq} and 72 dB L_{max} . Based upon a typical exterior-to-interior noise

level reduction for modern construction, interior noise levels are predicted to be 28 dB L_{eq} and 47 dB L_{max} .

Acceptable interior noise levels are generally considered to be in the range of 35-45 dBA L_{50}/L_{eq} . Therefore, the loading dock noise levels are predicted to be within an acceptable range at the adjacent residential uses and a *less-than-significant* impact to on-site residential uses relative to the Placer County Auburn-Bowman Community Plan and Placer County Noise Ordinance exterior noise level standards would occur. However, the recommended mitigation measures discussed below would further reduce any potential loading dock noise impacts.

Lot 8 / Villas F & G

The distance from the proposed loading dock to residential Villas F & G on Lot 8 is approximately 200 feet. At 200 feet, the predicted loading dock noise levels are 51 dB L_{eq} and 70 dB L_{max} . The predicted 51 dB L_{eq} exterior noise level would exceed the Placer County 50 dB L_{eq} exterior noise level standard by 1 dB. Therefore, loading docks noise levels would result in a *potentially significant* impact to residential Villas F & G. Recommended mitigation measures discussed below would further reduce any potential loading dock noise impacts.

Recreational Uses

The project is proposing a tennis court to be located in the central recreation area, north of Buildings C1-C6. The center of the proposed court would be located approximately 220 feet from the nearest existing residential areas to the north. The primary noise source associated with tennis courts are people talking/shouting and the bouncing of balls.

Typical hourly noise levels associated with tennis courts are approximately 58 dB L_{eq} and 75 dB L_{max} , at a distance of 50 feet from the center of the court. On-site noise-sensitive land uses are located approximately 100 feet to the west of the proposed tennis court. At this distance, predicted noise levels at noise-sensitive uses to the north are approximately 52 dB L_{eq} and 69 dB L_{max} .

These levels would exceed the Placer County 50 dB L_{eq} daytime noise level standard and the County's nighttime 45 dB L_{eq} exterior noise level standard. Additionally, the 69 dB L_{max} noise level would exceed the County's 65 dB L_{max} nighttime noise level standard. Therefore, operation of recreational uses would result in a *potentially significant* impact to on-site residences. Recommended mitigation measures discussed below would further reduce any potential loading dock noise impacts.

Mechanical Equipment Noise

Commercial/Retail/Office Use Buildings

The HVAC systems within the office and commercial use buildings would include rooftop mounted mechanical equipment which will be shielded from view by building parapets and/or mechanical wells. Based upon measurements conducted of modern HVAC mechanical installations, noise levels exceeding 45 db L_{eq} are not expected at distance beyond 60 feet from the façade of a typical commercial/office/retail building with rooftop mounted HVAC equipment. The nearest proposed residential areas would be located 100 feet or more from the proposed commercial/office/retail use building façades. Therefore, commercial/office/retail mechanical equipment noise would comply with the county's 45 db L_{eq} exterior noise level standard and a ***less-than-significant*** impact would occur.

Central Plant (Building J1)

As discussed earlier, the mechanical schematics of the Central Plant are not available at this time; however, it is anticipated that the Central Plant would require ventilation openings for air circulation. The noise analysis anticipated that the Central Plant would require ventilation openings for the introduction of fresh air and exhaust of waste heat from the HVAC process. Therefore, mechanical noise from the Central Plant could impact proposed residential areas located approximately 50 feet west of the proposed Central Plant. Therefore, mechanical noise would be emitted from the Central Plant activities and possibly impact nearby sensitive receptors, which is a ***potentially significant*** impact. Mitigation would be required to reduce the overall noise impact related to the Central Plant operations.

Parking Lot Noise

Parking lot noise typically includes periods of conversation, doors slamming, engines starting and stopping and vehicle passage. j.c. brennan & associates, Inc. file data for parking lot activities was used to model the parking lot noise environment for the project site. An average sound exposure level (SEL) of 71 dB at a distance of 50 feet was used to represent parking lot arrivals and departures.

The majority of the commercial/office/retail use parking lots will be located along the east side of Richardson Boulevard, behind the future commercial buildings. Therefore, parking lot noise at the Timberline Campus will be reduced through distance and shielding from the intervening buildings.

H1-H3 Parking Lot Areas

The traffic analysis indicates that the PM peak hour trip generation for the H1-H5 medical offices is 312 trips. Assuming that approximately half of those trips result in

parking lot movements in the parking lot east of Buildings H1-H3, the peak hour L_{eq} value can be calculated as follows:

$$L_{eq} = SEL + 10 \log Neq - 35.6, \text{ dB where:}$$

SEL is the mean SEL of the event, Neq is the sum of the number of hourly events (156), and 35.6 is 10 times the logarithm of the number of seconds in an hour. Based upon the calculation above, the predicted noise level due to parking lot activities is 57 dB L_{eq} at a reference distance of 50 feet.

The nearest on-site residential area is located approximately 200 feet west of the center of the proposed parking lot. Adjusting for distance, the peak hour L_{eq} at the nearest residential property is approximately 45 dB L_{eq} . This level would comply with the Placer County 50 dB L_{eq} daytime exterior noise level standard and a *less-than-significant* impact would occur.

Maximum noise levels from parking lot activities are typically 63 dB L_{max} at a distance of 50 feet. The center of the closest parking spaces are proposed to be located at a distance of approximately 140 feet from the nearest residential area to the west. At this distance maximum noise levels are predicted to be 54 dB L_{max} . The predicted 54 dB L_{max} parking lot noise level complies with the Placer County daytime 70 dB L_{max} and nighttime 65 dB L_{max} exterior noise level standards and a *less-than-significant* impact would occur.

Commercial Recreation/Fitness Parking Lot Area

The traffic analysis indicates that the PM peak hour trip generation for the Commercial Recreation and Fitness uses is 159 trips. The peak hour L_{eq} value can be calculated as follows:

$$L_{eq} = SEL + 10 \log Neq - 35.6, \text{ dB where:}$$

SEL is the mean SEL of the event, Neq is the sum of the number of hourly events (159), and 35.6 is 10 times the logarithm of the number of seconds in an hour. Based upon the calculation above, the predicted noise level due to parking lot activities is 57 dB L_{eq} at a reference distance of 50 feet. The nearest on-site residential area is located approximately 575 feet west of the center of the proposed parking lot. Adjusting for distance, the peak hour L_{eq} at the nearest residential property is approximately 36 dB L_{eq} .

Maximum noise levels from parking lot activities are typically 63 dB L_{max} at a distance of 50 feet. The center of the closest parking spaces are proposed to be located at a distance of approximately 380 feet from the nearest residential area to the west. At this distance maximum noise levels are predicted to be 46 dB L_{max} . The predicted 36 dB L_{eq} parking lot noise level would comply with the Placer County 50 dB L_{eq} daytime and 45 dB L_{eq} nighttime exterior noise level standards and a *less-than-significant* impact would occur.

The predicted 46 dB L_{max} parking lot noise level complies with the Placer County daytime 70 dB L_{max} and nighttime 65 dB L_{max} exterior noise level standards and a ***less-than-significant*** impact would occur

Commercial Parking Lot Area

The traffic analysis indicates that the PM peak hour trip generation for the commercial uses is 113 trips. Assuming that approximately one-third of those trips result in parking lot movements in the “Additional Commercial” parking lot east of the Assisted Living Building “K2”, the peak hour L_{eq} value can be calculated as follows:

$$L_{eq} = SEL + 10 \log Neq - 35.6, \text{ dB where:}$$

SEL is the mean SEL of the event, Neq is the sum of the number of hourly events (35), and 35.6 is 10 times the logarithm of the number of seconds in an hour. Based upon the calculation above, the predicted noise level due to parking lot activities is 51 dB L_{eq} at a reference distance of 50 feet.

The nearest on-site residential area is located approximately 120 feet west of the center of the proposed “Additional Commercial” parking lot area. Adjusting for distance, the peak hour L_{eq} at the nearest residential property line is approximately 43 dB L_{eq} . Maximum noise levels from parking lot activities are typically 63 dB L_{max} at a distance of 50 feet. The center of the closest parking spaces are proposed to be located at a distance of approximately 80 feet from the nearest residential property line to the west. At this distance maximum noise levels are predicted to be 59 dB L_{max} .

The predicted 43 dB L_{eq} parking lot noise level would comply with the Placer County 50 dB L_{eq} daytime noise level standard. Peak hour parking lot activities are not expected during nighttime hours. Therefore, parking activities are not anticipated to exceed the County’s nighttime 45 dB L_{eq} exterior noise level standard and a ***less-than-significant*** impact would occur.

The predicted 59 dB L_{max} parking lot noise level complies with the Placer County daytime 70 dB L_{max} and nighttime 65 dB L_{max} exterior noise level standards and a ***less-than-significant*** impact would occur.

Summary

Table 9-14 provides a summary of predicted noise levels due to on-site activities at proposed sensitive receptors.

Table 9-14 Predicted Project-Related Noise Levels with Varying Noise Barrier Heights					
Noise Source	Direction of Nearest Residential Property Line	Predicted Peak Hour Noise Levels		Placer County Noise Standards	
		Unmitigated Noise Level	Wall Height - Noise Level, L_{eq}/L_{max} ¹	Daytime: 7 a.m. to 10 p.m.	Nighttime: 10 p.m. to 7 a.m.
Truck Circulation	North Common Outdoor Activity Area	48 dB L_{eq} 64 dB L_{max}	NA	50 dB L_{eq} 70 dB L_{max}	45 dB L_{eq} 65 dB L_{max}
Loading Dock	South MF Residential Property Line	61 dB L_{eq} 81 dB L_{max}	NA - No Exterior Noise Receptor (No Impact)	50 dB L_{eq} 70 dB L_{max}	45 dB L_{eq} 65 dB L_{max}
	Southwest SF Villa Residential Property Line	51 dB L_{eq} 70 dB L_{max}	6' - 45 dB L_{eq}	50 dB L_{eq} 70 dB L_{max}	45 dB L_{eq} 65 dB L_{max}
Tennis Court	West MF Villa Residential Property Line	52 dB L_{eq} 69 dB L_{max}	NA	50 dB L_{eq} 70 dB L_{max}	45 dB L_{eq} 65 dB L_{max}
H1-H3 Parking Lot	West MF Residential Property Line West MF Property Line	45 dB L_{eq} 54 dB L_{max}	NA	50 dB L_{eq} 70 dB L_{max}	45 dB L_{eq} 65 dB L_{max}
Rec. & Fitness Parking Lot		36 dB L_{eq} 46 dB L_{max}	NA	50 dB L_{eq} 70 dB L_{max}	45 dB L_{eq} 65 dB L_{max}
Commercial/Retail Parking Lot		43 dB L_{eq} 59 dB L_{max}	NA	50 dB L_{eq} 70 dB L_{max}	45 dB L_{eq} 65 dB L_{max}
Notes: ¹ Noise reductions apply to first-floor locations only Bold indicates noise levels exceeding Placer County standards.					
Source: j.c. brendan & associates, Inc., Timberline at Auburn Environmental Noise Assessment, March 2010.					

The operation of the on-site features of the proposed project discussed above would result in significant increases in noise levels derived from activities associated with the loading docks, tennis courts, central plant and emergency generators, parking lots H1-H3, and the commercial parking lots. The predicted increases to the existing noise levels would exceed County noise standards and are considered **potentially significant** impacts.

Mitigation Measure(s)

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

- 9-4(a) *Prior to Improvement Plan approval, a noise barrier shall be shown along the boundary of Lot 8 and Lot 19 to reduce impacts to affected sensitive*

receptors from loading dock noise levels determined in this DEIR (shown conceptually in Figure 9-6), for the review and approval by the Planning Department. A noise barrier six feet in height would be required (minimum) along the boundaries of Lot 8 and Lot 19 and wrap along the east side and a portion of the north side of Lot 8 to shield the rear yard lots of Villa F. Barriers could take the form of earth berms, solid walls, or a combination of the two. Appropriate materials for noise walls include precast concrete or masonry block. Other materials may be acceptable provided they have a density of approximately four pounds per square foot.

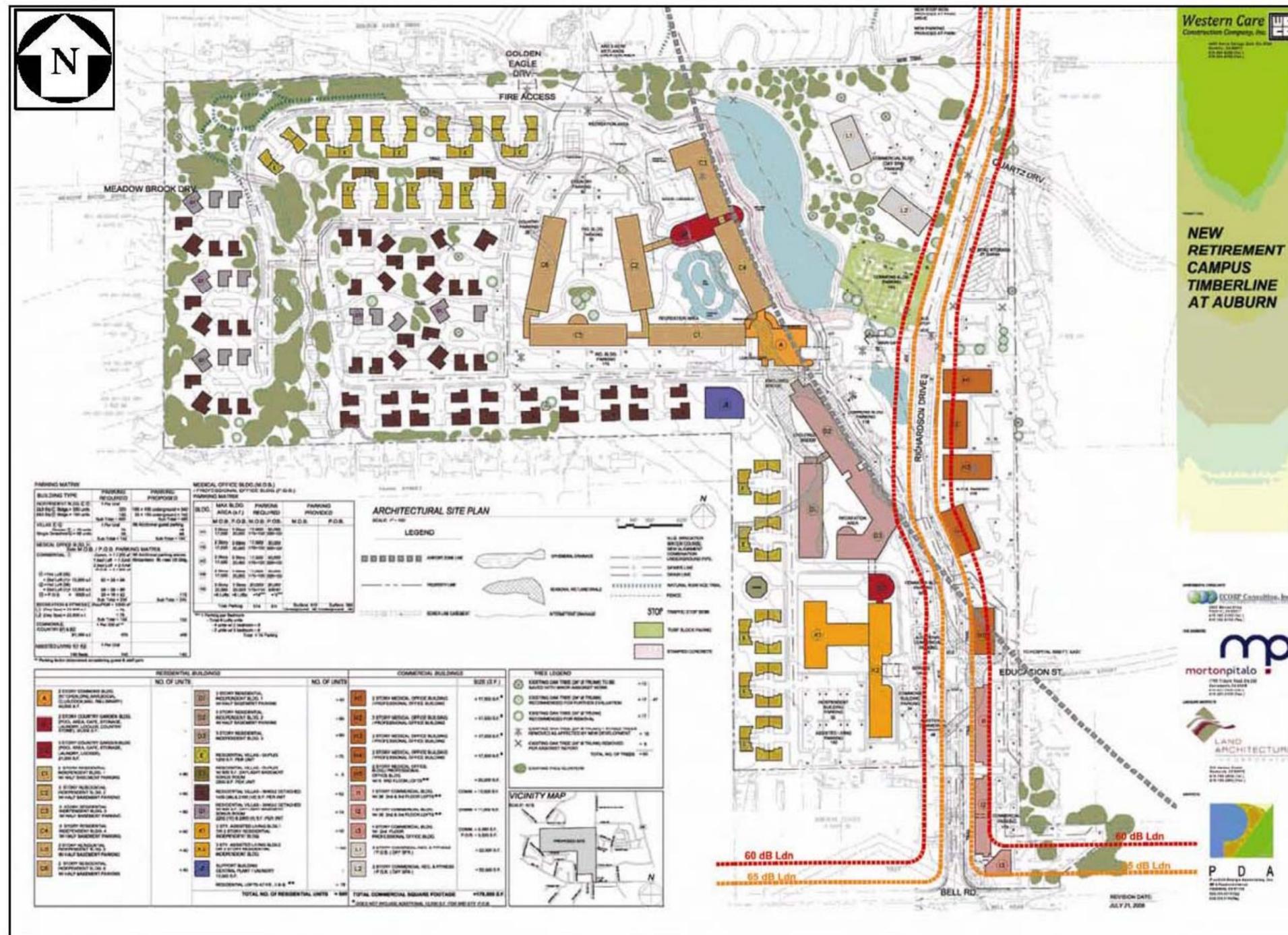
- 9-4(b) *Implement Mitigation Measure 9-3(a).*
- 9-4(c) *Implement Mitigation Measure 9-3(c).*
- 9-4(d) *Prior to Improvement Plan approval, the project improvement plans shall show a setback distance of 130 feet from the tennis court, as measured from the center of the tennis court, to the nearest on-site residence, for review and approval by the Planning Department. In addition, a sign shall be posted on the tennis court, limiting tennis court usage to the hours of 7:00 a.m. to 10:00 p.m. and lighting of the tennis court shall automatically shut off at 10:00 p.m.*

9-5 Potential exposure of new noise-sensitive uses to transportation noise levels.

Future on-site, noise-sensitive uses in the vicinity of Bell Road and Richardson Drive could be negatively impacted from traffic noise levels exceeding the County exterior and interior standards. The interior and exterior noise level standards for the County are 60 dB L_{dn} and a 45 dB L_{dn} , respectively. The FHWA traffic noise prediction model was used to generate the Cumulative plus Project noise levels adjacent to Bell Road and Richardson Drive. The distances between each road segment to the 60, 65, and 70 dB noise contours is shown in Table 9-12. The predicted noise contours are illustrated in Figure 9-7 below.

Based upon a review of predicted noise contours, new outdoor recreation areas would not be exposed to traffic noise levels exceeding the 60 dB L_{dn} noise standards set forth by the County. Typical construction techniques would typically provide a reduction in exterior-to-interior noise levels of approximately 25 dB L_{dn} . In other words, if exterior noise levels are 70 dB L_{dn} , newly constructed structures would experience an interior noise level of approximately, 45 dB L_{dn} (70 minus 25), which would generally be within the range of the County's interior noise level exposure. A review of the predicted noise contour (See Figure 9-7) confirms that no new sensitive receptors would be developed and subjected to noise levels greater than 70 dB L_{dn} .

Figure 9-7
 Predicted Future (2030) Airport and Traffic Noise Contours



j.c. brennan & associ
 consultants in aco

The majority of the project site is located outside of the Auburn Municipal Airport's existing and future 55 dB CNEL airport noise contours. According to the future noise contour lines identified within the Auburn Municipal Airport Master Plan (updated in 2007), approximately half of the project site could be exposed to future exterior noise levels approximately 55 dB CNEL levels, with a maximum exposure up to 60 dB Ldn. Although new sensitive receptors would be potentially exposed to exterior noise levels within this range, the exterior noise levels experienced by new sensitive receptors would not exceed the County exterior noise standard and would therefore result in a *less-than-significant* impact.

Mitigation Measure(s)

None required.

9-6 Potential aviation noise could disturb sleep patterns of new sensitive receptors within the project site.

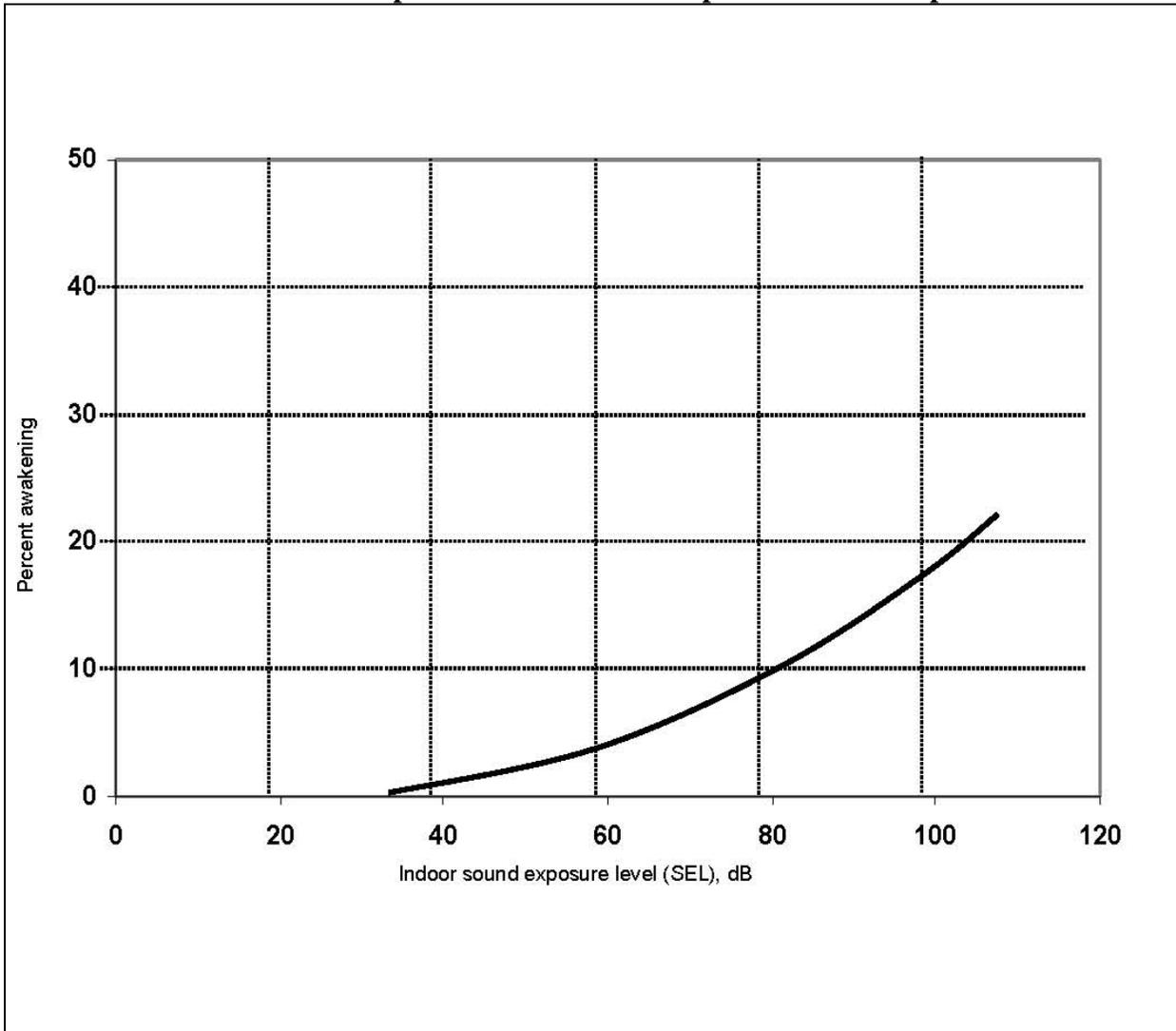
The project site is located within the ALUCP compatibility zones, C1 and C3. The Auburn Municipal Airport is approximately one mile east of the project site. The airport contains a single runway oriented in an east to west direction. The reported daily average for flight operations is 140. The operations of the airport could include temporary levels of increased noise that would impact new sensitive receptors included within the proposed project.

Furthermore, as identified in Impact Statement 9-5, the majority of the project site is located outside of the Auburn Municipal Airport's existing and future 55 dB CNEL airport noise contours (See Figure 9-7). Future on-site sensitive receptors are not anticipated to experience exterior noise levels that exceed the County exterior noise standard of 55 dB CNEL (maximum of 60 dB Ldn).

To properly analyze the potential impacts of aircraft flyovers related to the on-site sensitive receptors, j.c. brennan & associates, Inc. utilized the studies and research conducted by the Federal Interagency Committee on Airport Noise (FICON). As shown in Figure 9-8, the relationship between sleep disturbances and aviation noise levels is represented in the FICON curve graph.

The noise monitoring data was collected at various locations throughout the project site, as illustrated in Figure 9-1 and summarized in Table 9-2. The average noise level during the three days of monitoring was approximately 77 dB SEL with several events up to 85 dB SEL. If typical construction practices are achieved for the proposed project, the average exterior noise level of 77 dB SEL would be reduced by approximately 25 dB SEL if windows are closed, resulting in an average exterior-to-interior noise level of 52 dB SEL.

Figure 9-8
FICON Sleep Disturbance Dose-Response Relationship



Based on the FICON curve, a 52 dB SEL interior noise level would correspond with a 2.2-percent chance of waking a person up during the aviation noise event. If the same methods and assumptions were employed for the high range of collected data (85 dB SEL), a 60 dB SEL (85 minus 25 dB SEL) would correspond to a 3.8-percent chance of waking an individual.

Although there are no set standards sleep disturbance, the conservative approximation of 3.8-percent of new residents of the proposed project being woken up during a high-range aviation event is considered to be a very low chance of occurrence. As illustrated in Figure 9-4, Future 2025 Airport Noise Level Contours, the project site would be located in the outer contour estimated for 55 dB CNEL. Furthermore, standard construction practices would reduce exterior to interior noise levels by approximately 25 dB SEL, which would further reduce the potential of new, on-site sensitive receptors exposed to temporary airport noise sources during periods of sleep. Therefore, the potential for new on-site sensitive receptors being woken up during an aviation event from the nearby Auburn Municipal Airport is considered to be a *less-than-significant* impact.

Mitigation Measure(s)

None required.

Endnotes

¹ j.c. brennan & associates, Inc. *Timberline at Auburn Environmental Noise Assessment*. March 2010.

² Placer County. *Placer County General Plan*. August 1994.

³ Placer County. *Placer County General Plan EIR*. October 1993.

⁴ Placer County. *Placer County General Plan Background Report*. August 1994.

⁵ Placer County. *Auburn/Bowman Community Plan*. June 1994.

⁶ Placer County. *Placer County Noise Ordinance*. 2004.