

4.4 NOISE

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Noise – Environmental Setting

This section gives background information regarding noise sources and noise exposure in Sonoma County. Included is the methodology used for noise exposure analysis. *Appendix 7.7 Noise* further describes how sound is measured, the effects of noise on people, and criteria for acceptable noise exposure. Noise impacts are most closely related to the Noise, Land Use, and Air Transportation Elements of the *Draft GP 2020*.

METHODS USED TO DEVELOP NOISE EXPOSURE INFORMATION

According to the Government Code and General Plan Guidelines, noise exposure contours should be developed in terms of the Day / Night Average Level (L_{dn}) or Community Noise Equivalent Level (CNEL). Both of these descriptors represent the weighted energy noise level for a 24-hour day after the inclusion of a ten dB penalty for noise levels occurring at night between the hours of 10:00 pm and 7:00 am. The CNEL descriptor additionally includes a penalty of about five dB for noise levels occurring during the evening hours of 7:00 pm and 10:00 pm. The CNEL descriptor was developed to quantify aircraft noise. Its use is required when preparing noise exposure maps for airports within the State of California. The CNEL and L_{dn} descriptors are generally considered to be equivalent to each other for most community noise environments within ± 1.0 dB. The L_{dn} descriptor is used to quantify noise from the identified major transportation noise sources in the county.

To supplement the L_{dn} noise descriptor, the hourly L_{eq} and L_{max} descriptors have been used to characterize noise levels from measured stationary noise sources. Because many industrial noise sources operate sporadically, the hourly L_{eq} and L_{max} are more useful for predicting noise conflicts from such sources than is the L_{dn} . The L_{dn} , by definition, is a modified average noise exposure over 24 hours. If a noise source operates only a few hours a day, averaging the noise over 24 hours may underestimate its nuisance potential. To address these concerns, noise exposures from non-transportation noise sources have been described in terms of the observed or predicted average and maximum noise levels.

Analytical noise modeling techniques were used to develop generalized noise contours for existing and future conditions. Analytical noise modeling techniques generally use source-specific data, including descriptions of noise-generating equipment or activities, hours of operation, seasonal fluctuations, and average levels of noise from source operations. Analytical methods have been developed for many environmental noise sources, including roadways, railroad line operations, railroad yard operations, industrial plants, and aircraft / airport operations. Such methods will produce reliable results as long as data inputs and assumptions are valid for the sources being studied.

The noise exposure information developed does not include all conceivable sources of industrial or commercial noise within Sonoma County. Rather, it focuses on the existing sources of noise which have been identified by the County as being potentially significant.

Definitions of common noise and planning terms follow.

Community Noise Equivalent Level (CNEL): The average equivalent sound level during a 24-hour day, obtained after addition of approximately five decibels to sound levels in the evening from 7:00 pm to 10:00 pm and ten decibels to sound levels in the night before 7:00 am and after 10:00 pm. As a practical matter, there is usually little difference between the CNEL and the Day / Night Average sound level (see below). For most purposes, they can be used interchangeably.

Day / Night Average Sound Level L_{dn} : The average equivalent sound level during a 24-hour day, obtained after addition of ten decibels to sound levels in the night after 10:00 pm and before 7:00 am (See discussion of CNEL and L_{dn} above).

Equivalent Sound Level L_{eq} : The sound level containing the same total energy as a time varying signal over a given sample period. L_{eq} is typically computed over a 1-hour sample period.

Maximum Sound level L_{max} : The maximum sound level recorded during a noise event.

L_{50} : Sound level that is equaled or exceeded 50 percent of the time during the measurement period.

New Development: Projects requiring land use approval or building permits, but excluding remodeling or additions to existing structures.

Noise-Sensitive Land Use: Residential land uses, transient lodging, schools, libraries, museums, day-care centers, churches, hospitals, and nursing homes.

Outdoor Activity Areas: Patios, decks, balconies, outdoor eating areas, swimming pool areas, yards of dwellings and other areas which have been designated for outdoor activities and recreation.

Sound Level: Except as otherwise specified, all sound levels referred to in this policy document are A-weighted sound pressure levels, in decibels (dB), re: 10^{-6} micropascals. A-weighting de-emphasizes the very low and very high frequencies of sound in a manner similar to the human ear. Most community noise standards utilized A-weighting, as it provides a high degree of correlation with human annoyance and health effects.

Non-Transportation Noise Source: Any fixed or mobile noise source not preempted from local control by existing federal or state regulations. Examples of such sources include industrial and commercial facilities, and vehicle movements on private property.

Transportation Noise Source: Traffic on public roadways, railroad line operations, and aircraft in flight. Control of noise emitted by these individual sources is preempted by existing federal or state regulations. However, the effects of noise from transportation sources may be controlled by regulating the location and design of adjacent land uses, or, in the case of roadways, by providing noise barriers.

Appendix 7.7 Noise further describes how sound is measured, the effects of noise on people, and criteria for acceptable noise exposure. It further provides a reference for use by Sonoma County during the review of documents or proposals that refer to the measurement and effects of noise.

ROADWAYS

The Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA-RD-77-108) was used to develop L_{dn} contours for roadways in Sonoma County. The FHWA model is the analytical method currently favored by most state and local agencies, including Caltrans, for highway traffic noise prediction. The model is based upon reference energy emission levels for automobiles, medium trucks (i.e., two axles) and heavy trucks (i.e., three or more axles), with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. The FHWA model was developed to predict hourly L_{eq} values for free-flowing traffic conditions, and is generally considered to be accurate within ± 1.5 dB. The model assumes a clear view of traffic with no shielding at the receiver location. To predict L_{dn} values, it is necessary to determine the hourly distribution of traffic for a typical day and adjust the traffic volume input data to yield an equivalent hourly traffic volume. The Calveno¹ traffic noise emission curves were used as recommended by Caltrans because they more accurately calculate noise levels generated by California traffic.

Existing traffic volume data were obtained from Caltrans and the Sonoma County Department of Transportation and Public Works. Truck volume estimates were based on the data provided by Caltrans, and on consultant observations of relative truck mix on county roads. The day / night distribution of traffic was based on statewide trends and files from the office of Brown-Buntin Associates (EIR noise consultant). Vehicle speeds assumed for traffic noise modeling were the posted vehicle speeds.

Exhibit 7.7-5 and **Exhibit 7.7-6** in *Appendix 7.7 Noise* show the projected distances from roadway center lines to the existing 60 and 65 dB L_{dn} contours for Sonoma County state highways and for county roads. The FHWA model input assumptions are available on file at the Sonoma County PRMD.² Noise-sensitive land uses located within these contours are potentially affected by traffic noise in accordance with the land use compatibility criteria of the *Draft GP 2020 Noise Element*. In the impact section below, traffic noise projections associated with the *Draft GP 2020* are compared to the existing traffic noise projection.

MAJOR INDUSTRIAL NOISE SOURCES

The production of noise is an inherent part of many industrial, commercial, and agricultural processes, even when the best available noise control technology applied. Noise production within industrial or commercial facilities is controlled indirectly by federal and State employee health and safety

¹ The Calveno (California Vehicle Noise Emission Level) noise emission factors were published by Caltrans in 1984, based upon more than 3,000 noise measurements. The Calveno curves replace the federally-recommended noise emission curves in the FHWA model. Caltrans required use of the Calveno noise emission factors for its studies by memorandum dated February 28, 1985.

² Sonoma County Permit and Resource Management Department, 2550 Ventura Avenue, Santa Rosa, CA 95403-2829

regulations (i.e., OSHA and Cal-OSHA), but exterior noise emissions from such operations have the potential to exceed locally acceptable standards at nearby noise-sensitive land uses.

To describe typical noise levels associated with industrial noise sources in Sonoma County, several major industrial sources were identified by the County staff for study. Noise exposure information for those sources was developed from operational data obtained from source operators (when available), noise level measurements conducted at reference locations around the noise source, and file information collected by Brown-Buntin Associates, Inc. (EIR noise consultant) for similar sources. Only existing noise levels are described since there are too many variables in permitted activities and unknown future economic conditions to predict future noise exposure with reliability.

The following discussions provide generalized information concerning the relative noise impacts of the identified sources, and they identify specific noise sources which should be considered in the review of development proposals where potential noise conflicts could result. Not all industrial noise sources in Sonoma County are discussed. Unidentified industries or other major noise sources may exist, which could generate significant noise levels and result in noise-related land use conflicts.

Predicted distances to the 45 dBA and 50 dBA hourly L_{eq} noise contours were prepared for major stationary noise sources where it was determined that such contours would be located off the property occupied by the source. The generalized contours should be used as a screening device to determine when potential noise-related land use conflicts may occur, and when site-specific studies may be required to properly evaluate noise at a given noise-sensitive receiver location.

Mineral Resource Extraction and Processing

The development of mineral resources, which involves the use of noise-producing machinery, is subject to the policies of the *Aggregate Resources Management Plan (ARM Plan)*.³ The ARM Plan indicates where mineral resources may be mined. Those areas should be considered as potential noise sources during review of proposed nearby noise sensitive uses. Noise sources associated with mineral resource extraction may include the use of heavy equipment, shakers, screens, and asphalt burners. In addition, blasting may occur at hillside quarries.

Chapter 26c of the Sonoma County Code regulates surface mining and reclamation, and includes noise standards for mining operations. The noise standards may be made more stringent when warranted by local circumstances.

There are over 20 different mining operators in Sonoma County, and a greater number of mining and processing sites. The sizes of the operations vary; some may produce less than 5,000 tons per year while others may produce up to 2,000,000 tons per year.

The noise landscape at mining sites may include stationary plant noise, earthmoving equipment noise, truck noise, back-up beepers, and blasting as well as other ancillary activities, such as recycling, asphalt, and cement batch plants. Noise-producing activity from mining and aggregate processing is greatest in the late summer and early fall when construction activity is at its highest level.

³ *Sonoma County Aggregate Resources Management Plan and Environmental Impact Report*, EIP & Associates, November 1994.

Mineral extraction and aggregate processing operations are frequently sources of noise complaints, and may have a greater potential than other land uses to disturb neighbors for the following reasons:

- They are located outdoors rather than in a building;
- They are often located in rural areas with low background noise levels;
- They often start in the early morning when residents are more sensitive to noise disturbances. For example, facility gates may open at 6:00 am, but some activities and trucking may begin earlier;
- Night time operations are becoming more frequent and necessary to supply night time construction projects on highways;
- Heavy equipment and truck noise, e.g., noise from engines, back-up beepers, and “Jake” brakes can be heard over long distances;
- Blasting may be used to quarry materials;
- Noise from mining is not always constant and broadband, but is often punctuated and irregular with occasional noise “spikes”, making it conspicuous even when the average sound level is within acceptable limits;
- Some operations are vested, and do not have to meet Noise Element standards. Noise from these operations may already exceed the Noise Element standards, and increased production levels allowed by vested rights could result in greater noise generation; and
- Truck haul routes often pass by residences and through communities.

Blue Rock Quarry

This facility is located at 7888 Highway 116 in Forestville. The facility operates Monday through Friday from 7:00 am to 4:30 pm. Activities include the processing and loading of gravel, serving anywhere between one and 100 semi-trucks per day. Noise producing equipment operated at the facility includes conveyors, shakers, rock crushers, and loaders.

Noise measurements were taken from a location approximately 30 feet across the roadway from the facility’s main entry gate. The largest contributor to the noise environment was the roadway automobile noise. Measured noise levels at the site were a L_{50} of 63.1 dB and an L_{max} of 67.9 dB (auto traffic). The approximate distances to the 45 and 50 dB hourly L_{50} contours are 241 and 135 feet, respectively, measured from the entry gate.

Canyon Rock

This facility is located at 7525 Highway 116 in Forestville, approximately one-half mile east of Blue Rock Quarry. The facility operates Monday through Friday from 7:00 am to 5:00 pm and Saturdays from 7:00 am to 12:00 noon (sometimes later). Activities include the processing and loading of sand, concrete, rocks, and gravel. Crushing and blasting operations also occur. Noise producing equipment operated at the site includes crushers, screeners, loaders, dozers, and heavy semi-trucks. This facility is a larger scale operation than the Blue Rock Quarry facility.

Extensive noise measurements were performed in 2003 for an EIR for the expansion of the Canyon Rock Quarry. Five sites in the range of 1,000 feet to 2,500 feet from the quarry operations were monitored continuously for several days. The average measured L_{50} noise levels when the quarry was in operation ranged from 39 dB at 2,500 feet to 59 dB at 1,000 feet. Based upon those data, the distance to the 45 dB L_{50} contour would be about 1,250 feet from the center of operations, and the 50 dB L_{50} contour would lie about 700 feet from the center of operations.

Shamrock Materials

This facility is located at 30022 Levee Road in Cloverdale, and it operates Monday through Friday from 6:00 am to 4:30 pm, and Saturdays from 7:00 am to 12:00 pm. Activities include truck loading, gravel screening, and ready-mix concrete operations. Noise producing equipment includes screeners, loaders, and heavy semi-trucks.

Noise measurements were taken July 17, 2002, approximately 100 feet from the southwest corner of the facility property line along the river. Measured noise levels were 67.0 dB L_{50} and 93.8 dB L_{max} . The approximate distances to the 45 and 50 dB L_{50} contours are 1,250 and 700 feet, respectively, measured from the property line.

Other Industrial Operations

Redwood Empire Remanufacturing

This facility is located at 26800 Asti Road in Cloverdale. The facility operates Monday through Friday (and some Saturdays) from 6:00 am to 5:00 pm. Activities include lumber remanufacturing, sizing, and sawing. Heavy truck loading and unloading also occurs. Noise producing equipment operated at the site includes saws, planers, standard lumber working equipment, and heavy semi-trucks.

Noise measurements were taken from approximately 70 feet across the roadway from the facility's main entry gate. The facility was in operation at the time of the measurements on July 17, 2002. However, the main contributor to the noise environment was the freeway traffic on US 101. Measured noise levels at the site were a L_{50} of 59.3 dB and an L_{max} of 62.6 dB. The approximate distances to the 45 and 50 dB hourly L_{50} contours are 363 and 205 feet, respectively, measured from the main entry gate.

Reuser Inc

This facility is located at 370 Santana Drive in Cloverdale. This facility operates Monday through Friday from 7:30 am to 5:00 pm. Reuser is a bulk landscape supply company. Typical operations include loading and unloading heavy trucks, movement of large amounts of landscape materials, and grinding of materials. Noise producing equipment at the location includes dump trucks, portable hogs, grinders, and heavy semi-trucks loading and offloading.

Noise measurements were taken approximately 60 feet from the southeast corner of the facility property line across the roadway (Santana Drive), on July 17, 2002. Measured noise levels at the site were an L_{50} of 47.0 dB and an L_{max} of 93.8 dB. A neighboring wine tank manufacturing business to the north of the Reuser facility, Modern Stainless Steel, generates an equal amount of noise. Banging from the wine tank manufacturer generated the L_{max} reading during monitoring. The approximate distances to the 45 and 50 dB L_{50} contours are 375 and 210 feet, respectively, measured from about 250 feet inside the entry gate.

Exhibit 4.4-1 summarizes the sound levels measured at the above Sonoma County industrial sites, and the distances to the 45 and 50 dB L₅₀ hourly noise level contours.

**Exhibit 4.4-1
Noise Levels From Sonoma County Industrial Sites**

Location	Date	Distance to Noise Source (feet)	Measured Sound Level (dB)		Distance to L ₅₀ Contours (feet)	
			L ₅₀ / L _{eq}	L _{max}	50 dB	45 dB
Blue Rock Quarry	7/18/2002	30	63.1	67.9	135	241
Canyon Rock	2003	1,900	47.0	58.0	700	1,250
Shamrock Materials	7/17/2002	100	67.0	93.8	700	1,250
Redwood Empire Remanufacturing	7/17/2002	70	59.3	62.2	205	363
Reuser Inc.	7/17/2002	300	47.0	93.8	210	375

Source: Brown-Buntin Associates, Inc

Wineries

Noise produced at wineries can be of concern during the “crush” season, when trucks deliver grapes to the wineries and when fork lifts transfer grapes into the wineries. Bird control propane ignition guns and electronic alarms are also used during this time. In addition it is becoming more common to conduct harvest activities at night. During the winter noise results from the use of frost protection wind turbines at night, and sometimes during the day. Irrigation pump sounds during dry weather cause noise. The occasional use of gopher control compression guns is strongly discouraged by the Commissioner due to the significant vibrations and noise produced.⁴

These and other related activities may create noise levels above and different from the ambient noise environment. File data indicate that average hourly noise levels from properly muffled vehicles and equipment operating at wineries will be less than 60 dB at a distance of 300 feet from the source. Nearby residents may complain about the noise from these activities. The Commissioner’s office has no official jurisdiction, but it attempts to informally mediate noise complaints through education of all parties to the dispute. Noise impacts from normal winery operations are not usually considered to be significant because there are often solutions available to reduce noise, or the activity causing the noise is short in duration.

However, wineries may also host occasional festivals and concerts, which may include the use of amplified sound systems. These activities can produce unacceptable noise levels, and the associated traffic problems may heighten public concern about the noise-producing activity. Therefore, when proposals are submitted to PRMD to allow wineries to conduct special events unrelated to the production of wine, noise is an important factor in the environmental review.

⁴ Nichols • Berman communication with Lisa Correia, Chief Deputy Agricultural Commissioner, Office of the Agricultural Commissioner, January, 2003.

Geothermal Development

Geothermal power plants are located in the Geysers area. The normal operation of geothermal power plants produces relatively constant noise levels from cooling towers, with occasional steam releases. The greatest potential for noise impacts occurs during site development, when drilling may result in an uncontrolled steam release, or when it is necessary to “blow out” steam lines during construction or maintenance. Temporary mufflers may be used to reduce steam release noise during construction, and permanent rock mufflers are frequently employed for routine steam releases during site operation. The remote location of the Geysers area, and the absence of nearby residential areas, limits the potential for noise-related land use conflicts in Sonoma County. In addition, the County has set a noise limit of 65 dB at the boundaries of leaseholds.

RAILROADS

The longest railroad route in Sonoma County is the NWP which roughly parallels US 101. The tracks from Novato to Healdsburg are owned by the SMART District; the tracks north of Healdsburg are owned by NCRA. Neither SMART nor NCRA is operating rail service at this time. Therefore, noise from railroad operations is not currently a factor in land use compatibility in Sonoma County.

However, it may be anticipated that the railroad lines in Sonoma County will be returned to service at some time in the future. The SMART District has proposed a passenger rail project on the NWP and intends to put a sales tax measure on the ballot in November 2006 to help fund the project. The project is currently undergoing environmental review. NCRA also has plans to resume freight service on the line. Development proposals adjacent to the railroad tracks should consider the potential impacts of noise due to passing locomotives and rail cars, as well as the use of warning horns within about 1,000 feet of crossings. Noise levels associated with rail operations will vary depending on the type of vehicle used and whether noise alternative measures are incorporated.

AIRPORTS

Noise exposure contours for the public use airports in the county have been prepared by the Sonoma County Airport Land Use Commission (ALUC).⁵

Noise exposure contours for airports use the Community Noise Equivalent Level (CNEL) metric to be consistent with the requirements of the State of California Airport Noise Regulations (CCR Title 21), and to be consistent with the land use compatibility planning guidelines adopted by the ALUC. The 55, 60, and 65 dB CNEL contours have been shown in the Comprehensive Airport Land Use Plan (CALUP).

The CALUP includes a noise compatibility criterion of 60 dB CNEL. This criterion is consistent with the transportation noise standards recommended for the Noise Element. Although the California Airport Noise Regulations require only that an airport ensure compatible land use within the 65 dB CNEL contour, the ALUC recommendations recognize the rural nature of Sonoma County, and the fact that ambient noise levels are lower in the county than in urbanized jurisdictions.

⁵ Sonoma County Comprehensive Airport Land Use Plan (CALUP), January, 2001.

INFINEON RACEWAY

The Infineon Raceway (formerly the Sears Point Raceway) is located on Highway 121, north of the intersection of Highways 37 and 121. The race track has been in use for many years, and has been the subject of noise concerns for the nearest neighboring residences, which are few and relatively distant.⁶

Typical racing activities include routine daily and weekend use by the Russell Racing School, testing by NASCAR and individual race teams, and weekend events for NASCAR, the American Le Mans Series (ALMS), Sports Car Club of America (SCCA), the American Motorcyclists Association (AMA), the National Hot Rod Association (NHRA), and other auto and motorcycle race sanctioning bodies.

Noise related activities at the race track are closely regulated by the conditions of approval for the current land use permit. One condition required continuous monitoring of noise at three locations for a period of 18 months. One of these monitoring locations was near Turn 7 on the race track property. The other noise monitoring sites were located at the Donnell/Faggiolli ranch and at the Lilly residence, northeast and northwest of the race track respectively.

The noise monitoring results were summarized on a quarterly basis in a report to Sonoma County Permit and Resource Management Department. The report includes the measured noise levels, the raceway schedule, and an analysis of whether the race track activity appeared to cause the measured noise levels to exceed the standards of the current Sonoma County Noise Element.

As a result of this noise monitoring study, the raceway installed a permanent noise monitor near the finish line, and various noise limitation standards have been developed for racing vehicles in order to better control raceway noise at the source. Permanent and continuous recording of noise levels at the finish-line sensor will allow raceway noise levels to be monitored over time, and will be used to prevent raceway noise levels from increasing in the future.

Many apparent exceedances of the noise standards at the residential receiver locations were difficult to reliably ascribe to race track activity. Furthermore, it appears that atmospheric effects were associated with exceedances during afternoon hours when the noise levels at the race track would not ordinarily be expected to exceed the standard.

The noise level data do indicate, however, that noise-sensitive land uses would not be compatible in close proximity to the race track. As a result, future development proposals within the general area should be carefully evaluated for noise compatibility.

SOLID WASTE DISPOSAL

Noise associated with solid waste disposal and transfer stations is produced by the use of engine-powered equipment and by heavy truck movements. During operating hours, landfill operations involve the use of bulldozers, scrapers, compactors, loaders, and watering trucks. At transfer sites, noise is produced by the use of loaders and transient heavy trucks. The access roads for landfills and

⁶ The recent upgrading of the race track was the subject of an extensive County land use approval process, including an EIR.

transfer stations usually experience a greater proportion of heavy truck traffic than otherwise similar roads. As a result, areas containing roads accessing solid waste facilities may experience higher traffic noise levels than other areas of the county.

Solid waste operations are typically in use only during daytime hours, so the noise effects are usually limited to that time period. Landfill cover and maintenance activities may also occur during early morning and evening hours, when public use is not allowed.

Sonoma County Central Landfill

The Sonoma County Central Landfill is located in an agricultural area southwest of Cotati. The landfill is open from 7:00 am to 4:00 pm. Engine-powered equipment used at landfills includes bulldozers, compactors, loaders, scrapers, and water trucks. This equipment moves among different areas of the landfill as new working faces are placed into operation. Back-up beepers and engines are the major noise sources. As in the past, noise from this landfill is barely audible at the nearest homes, though noise from truck traffic on the access roads is pronounced. There is also a generator building housing eight generators, which do not appear to produce audible noise at the nearest homes. Two new gas-cycle engine-powered generators are being placed into service outside the north side of the existing generator building. These units are subject to noise standards intended to ensure that the noise level of generators at the nearest home does not exceed 45 dB. At this time, the median noise level produced by landfill equipment operation is in the range of 50-55 dB at the nearest residential property line.

Healdsburg Transfer Station

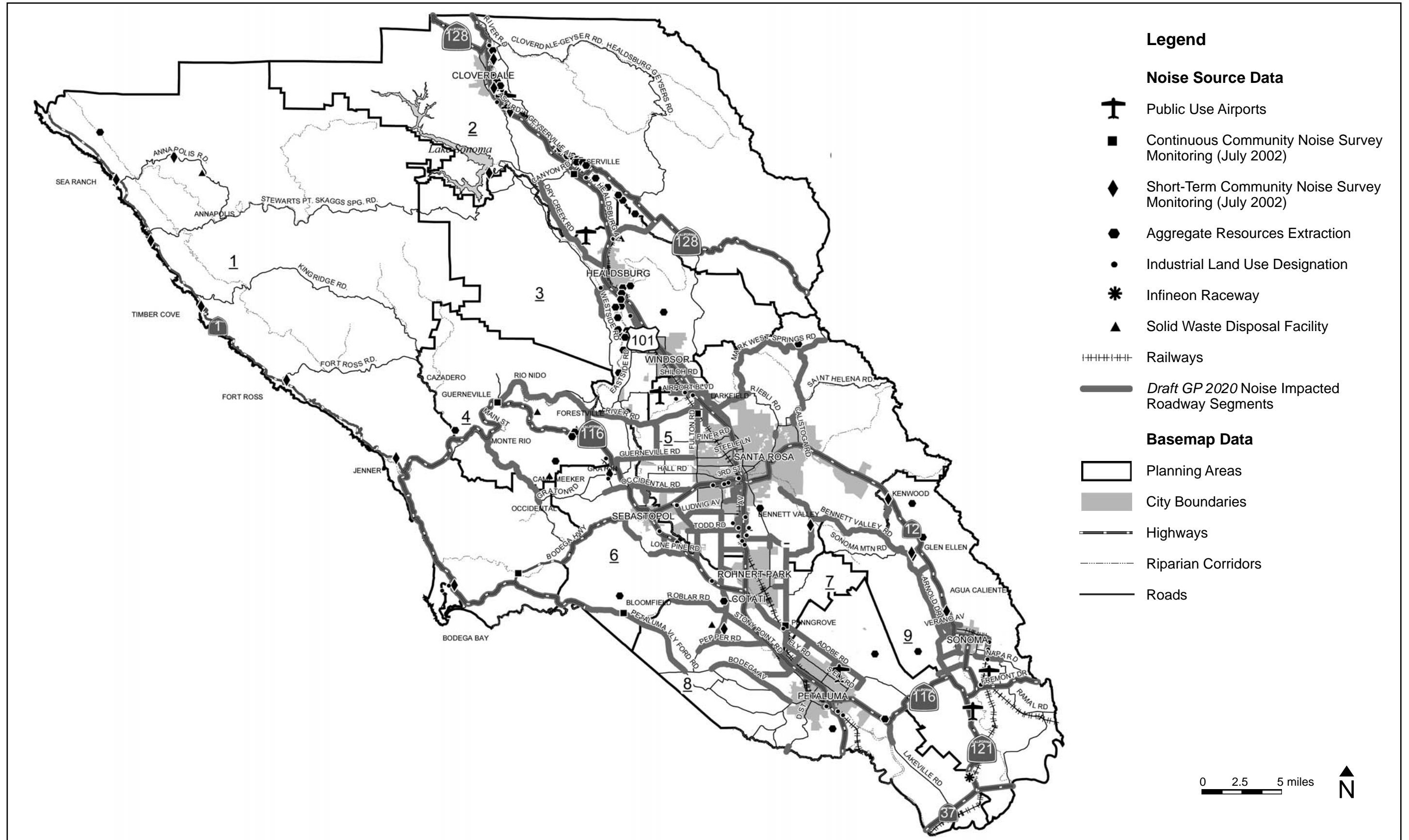
The Healdsburg Transfer Station replaced the landfill at the same site, near the intersection of Alexander Valley Road and Healdsburg Avenue. The transfer station is open daily from 8:00 am to 4:00 pm. Noise-producing activity at the transfer station includes truck traffic, use of a loader and bulldozer at the tipping floor, and movement of transfer trucks. The refuse is moved into piles by a rubber-tired loader, and compacted by the bulldozer. Back-up beepers and engines are the major noise sources. At this time, it does not appear that noise from this facility exceeds the noise standards at the nearest residences.

EXISTING NOISE LEVELS

A community noise survey was conducted to document noise exposure in representative areas of the county containing noise-sensitive land uses. The following noise-sensitive land uses have been identified for the purpose of this survey:

- All residential uses,
- Schools,
- Long-term care medical facilities, such as hospitals, nursing homes, etc.,
- Churches, and
- Libraries.

Noise monitoring sites were selected to be representative of typical conditions where such uses are located. A total of 22 monitoring sites were selected to document existing noise levels at these locations during July 2002. Continuous noise monitoring was employed at eight of the sites. The noise measurement sites are shown by **Exhibit 4.4-2** and the data are shown in **Exhibit 4.4-3**.



Source: Brown-Buntin Associates, Inc. and Sonoma County PRMD, 2005

**Figure 4.4-3
Summary of Measured Noise Levels And Estimated Day-Night Average Levels (L_{dn}) In
Areas Containing Noise Sensitive Land Uses**

Site No.	Description	Sound Levels, dB				
		Day		Night		L_{dn}
		L_{eq}	L_{max}	L_{eq}	L_{max}	
1 ^a	8210 Jaybird Way, Windsor	49.4	68.3	43.0	57.4	51.1
2 ^a	91 Geysers Ridge, Geyserville	58.5	73.3	53.5	73.3	61.1
3	Lake Sonoma Picnic Area	42.8	55.4	38.2	50.7	45-50
4	Annapolis post office	46.9	64.8	31.0	46.6	45-50
5	Black Point Beach parking area	45.9	61.3	52.0	69.5	50-55
6	Stewart's Point near store	58.8	78.5	45.4	64.1	50-55
7	Salt Point State Park	42.8	53.5	35.6	52.9	45-50
8	Fort Ross State Park	51.5	58.0	48.8	54.1	50-55
9	Graton Post Office	41.7	56.8	58.8	77.2	45-50
10 ^a	Johnson's Beach, Guerneville	52.2	69.7	46.8	66.8	54.5
11	Jenner Fire Station	43.1	55.8	30.8	45.0	40-45
12	Bodega Bay School	36.5	44.5	29.9	46.2	40-45
13 ^a	St. Theresa Church, Bodega Bay	51.9	74.2	43.0	57.9	52.3
14 ^a	Emma Herbert Mem. Park, Bloomfield	47.2	61.1	39.0	54.3	48.0
15	Bennett Valley Grange Hall	45.0	51.1	39.9	56.2	45-50
16	Kenwood Youth Park	44.1	53.3	33.8	44.4	40-45
17	Gibson & Hill, Glen Ellen	45.0	65.3	37.5	45.0	45-50
18 ^a	Glen Ellen	44.1	66.3	38.2	66.1	46.1
19	Boyes Hot Springs	49.2	67.8	43.2	65.0	50-55
20 ^a	Penngrove School	52.2	73.6	46.1	62.6	54.1
21 ^a	3276 Fulton Road, Mark West Springs	52.6	73.5	45.6	60.5	54.0
22	Meacham Road	44.1	53.3	33.8	44.4	40-45

^a 24 Hour Monitoring Site

Source: Brown-Buntin Associates, Inc

Noise level data collected during continuous monitoring included the average (L_{eq}), maximum (L_{max}) and minimum (L_{min}) noise levels. Noise level data collected during the community noise survey are summarized in **Exhibits 4.4-4** through **4.4-11**. Hourly L_{eq} values shown in these exhibits are representative of energy average sound levels, and are very sensitive to single events such as vehicle passages. L_{max} and L_{min} values represent the maximum and minimum values measured each hour.

The community noise survey results indicate that typical noise levels in noise-sensitive areas range from 45 to 55 dB L_{dn} . These are relatively low noise levels, and are typical of small communities and rural areas. In more developed areas, increased local traffic will result in higher noise levels, in the range of 55 to 65 dB L_{dn} .

Exhibit 4.4-4
 Measured Hourly Noise Levels, Windsor Area, July 30-31, 2002

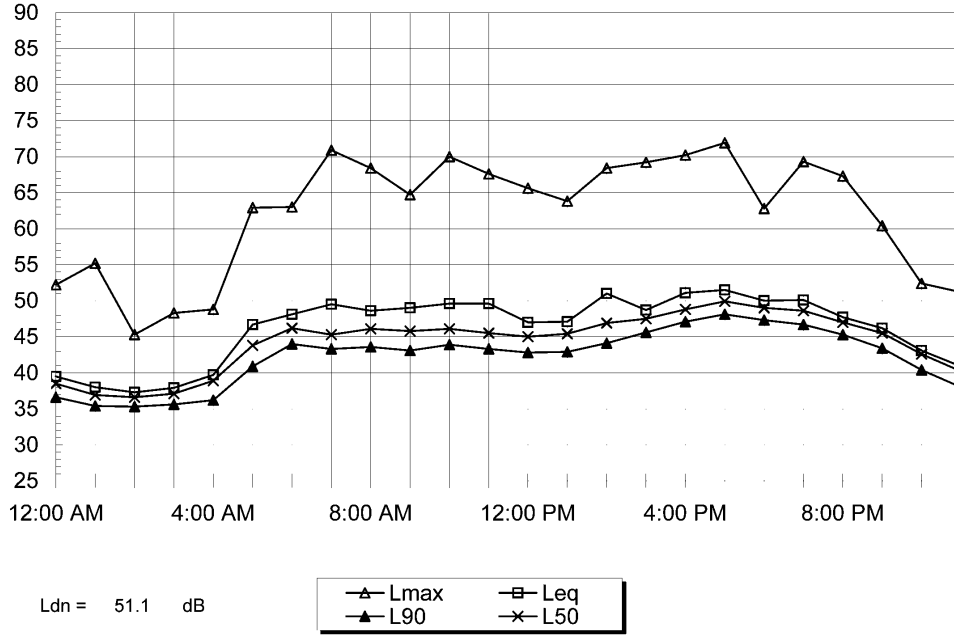


Exhibit 4.4-5
 Measured Hourly Noise Levels, Geyserville Area, August 2-3, 2002

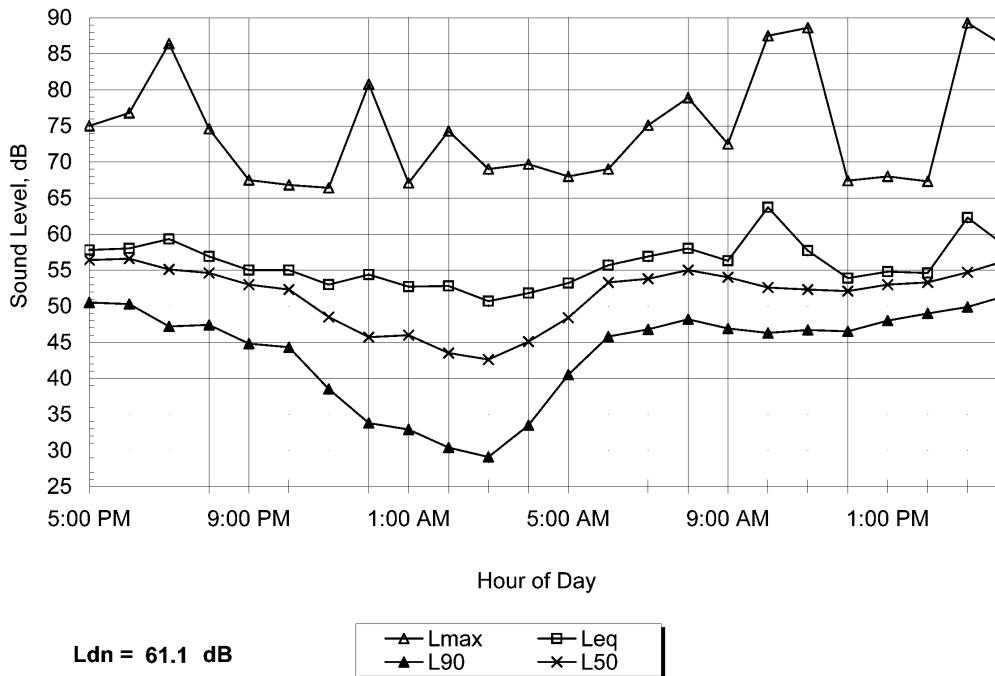


Exhibit 4.4-6
Measured Hourly Noise Levels, Guerneville Area, August 1, 2002

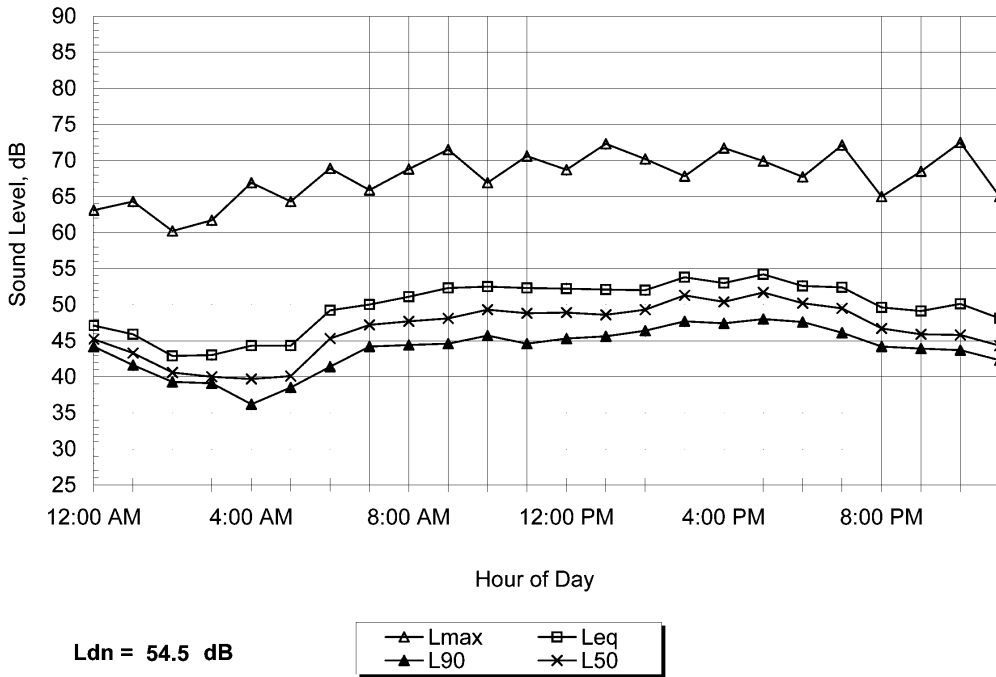


Exhibit 4.4-7
Measured Hourly Noise Levels, Bodega Bay Area, July 31-August 1, 2002

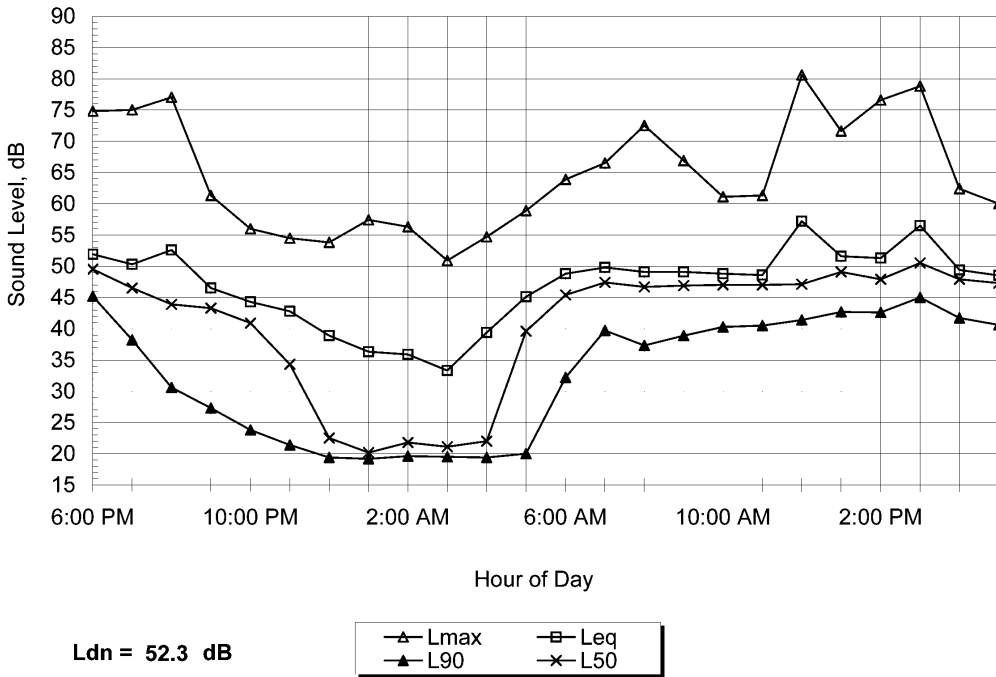


Exhibit 4.4-8
Measured Hourly Noise Levels, Bloomfield Area, July 31-August 1, 2002

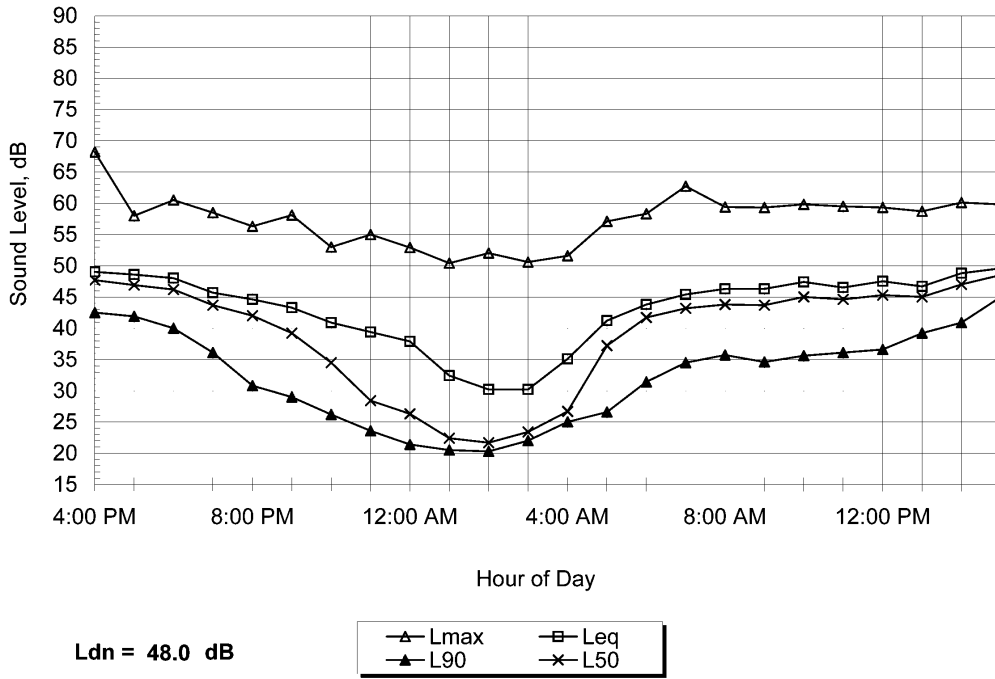


Exhibit 4.4-9
Measured Hourly Noise Levels, Glen Ellen Area, July 30, 2002

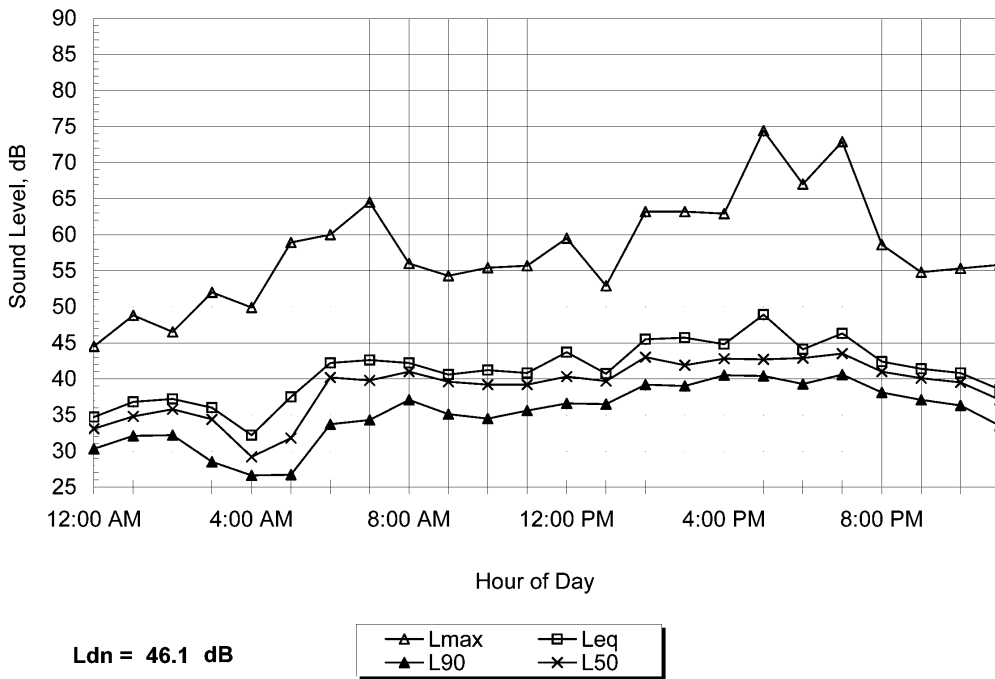


Exhibit 4.4-10
Measured Hourly Noise Levels, Penngrove Area, July 30, 2002

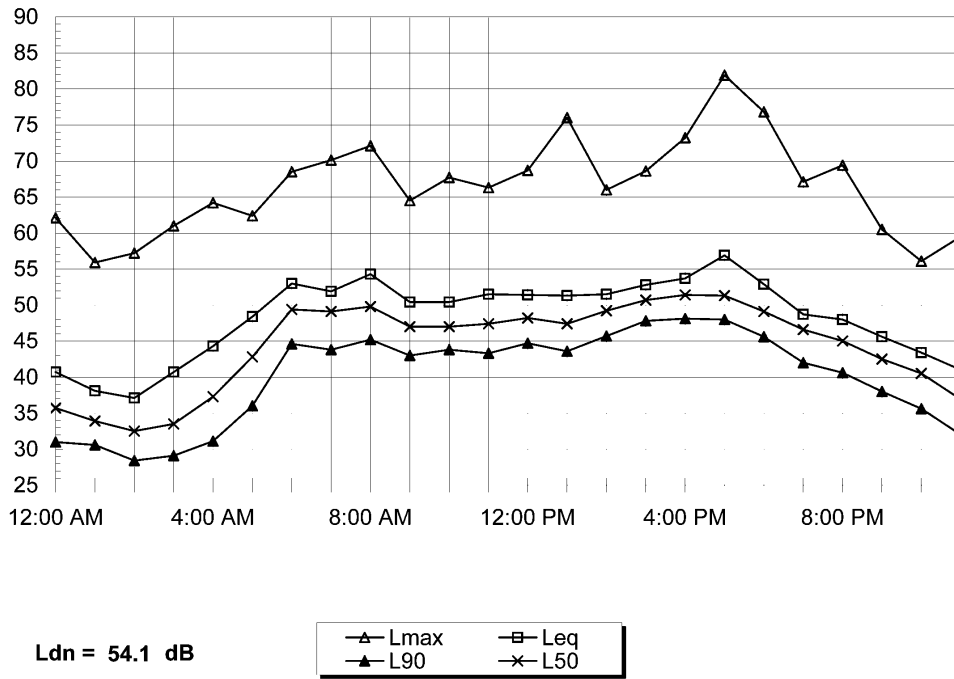
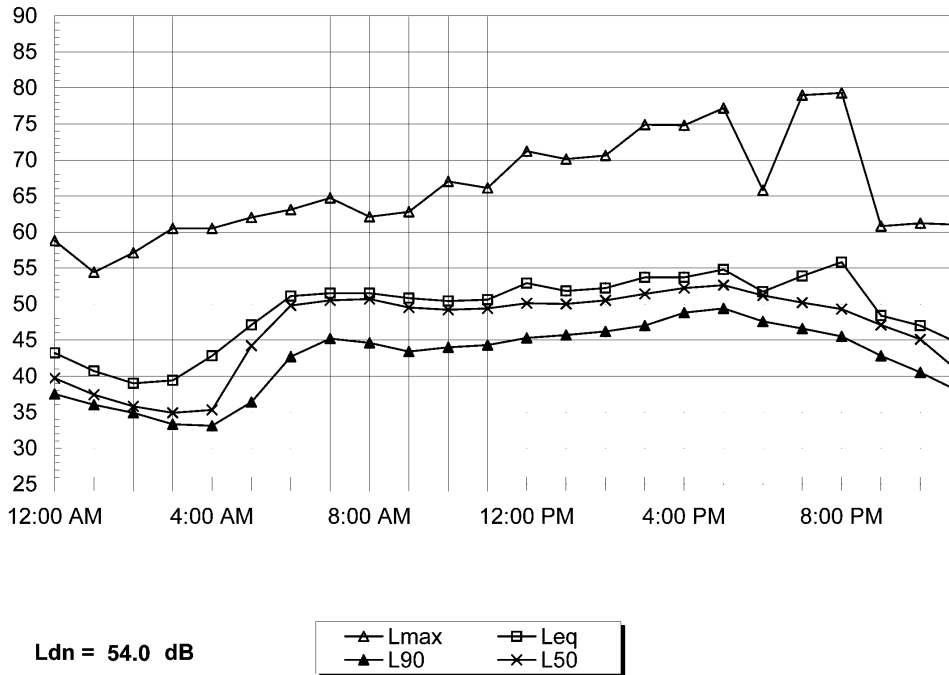


Exhibit 4.4-11
Measured Hourly Noise Levels, Mark West Springs Area, July 30, 2002



Noise – Regulatory Setting

COUNTY REGULATIONS

The County's *Aggregate Resources Management Plan* (ARM Plan) designates locations where mineral resources may be mined; these areas are potential noise sources and should be considered during permit review for new development. Noise from surface mining and reclamation is regulated by Chapter 26c of the Sonoma County Code.

The County's *Comprehensive Airport Land Use Plan* (CALUP) contains noise exposure contours for the public use airports in the county. These contours use the Community Noise Equivalent Level (CNEL) metric to be consistent with the both the requirements of the State of California Airport Noise Regulation (CCR Title 21) and the land use compatibility planning guidelines adopted by the County's Airport Land Use Commission (ALUC). The ALUC includes a lower noise compatibility criterion of 60 dB CNEL, recognizing that county ambient noise levels are lower in the county than urbanized jurisdictions.

STATE REGULATIONS

State employee health and safety regulations developed and enforced by the California Occupational Safety & Health Administration (CAL-OSHA) regulate the noise production within but not outside industrial or commercial facilities.

FEDERAL REGULATIONS

Under the Occupational Safety and Health Act of 1970 (29 U.S.C. § 651 et seq.), the Department of Labor, Occupational Safety and Health Administration has adopted regulations (29 C.F.R. § 1910.95) designed to protect workers against the effects of occupational noise exposure. These regulations list permissible noise exposure levels as a function of the amount of time during which the worker is exposed. The regulations further specify a hearing conservation program that involves monitoring the noise to which workers are exposed, assuring that workers are made aware of overexposure to noise, and periodically testing the workers' hearing to detect any degradation.

There are no federal laws governing off-site (i.e., community) noise.

Noise – Significance Criteria

The noise analysis uses criteria from the *State CEQA Guidelines*. According to these criteria, the project would have a significant noise impact if it would:

- Result in the 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;
- Result in the exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;

- Result in a substantial permanent increase in ambient noise levels in the project vicinity above existing levels without the project;
- Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above existing levels without the project;
- Expose people residing or working in the project area to excessive noise levels for a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport; or
- Expose people residing or working in the project area to excessive noise levels for a project within the vicinity of a private airstrip.

SIGNIFICANT CHANGES IN AMBIENT NOISE LEVELS

Some guidance as to the definition of a substantial permanent increase in ambient noise levels in the project vicinity above existing levels throughout the project is provided by the 1992 findings of the Federal Interagency Committee on Noise (FICON), which assessed the annoyance effects of changes in ambient noise levels resulting from aircraft operations. The FICON recommendations are based upon studies that relate aircraft and traffic noise levels to the percentage of persons highly annoyed by the noise. Annoyance is a summary measure of the general adverse reaction of people to noise that generates speech interference, sleep disturbance, or interference with the desire for a tranquil environment.

The rationale for the FICON recommendations is that it is possible to consistently describe the annoyance of people exposed to transportation noise in terms of L_{dn} . The changes in noise exposure that are shown in **Exhibit 4.4-12** are expected to result in equal changes in annoyance at sensitive land uses. Although the FICON recommendations were specifically developed to address aircraft noise impacts, they are used in this analysis to define a substantial increase in traffic noise.

Exhibit 4.4-12
Measures of Substantial Increase for Transportation Noise Exposure

Ambient Noise Level Without Project (L_{dn})	Significant Impact Assumed to Occur if the Project Increases Ambient Noise Levels by:
<60 dB	+ 5 dB or more
60-65 dB	+3 dB or more
>65 dB	+2 dB or more

Source: FICON as applied by Brown-Buntin Associates, Inc

The significance criteria listed in **Exhibit 4.4-12** are applied in the analysis of increased traffic noise (see *Impact 4.4-1 Increased Traffic Noise*).

Noise – Impacts and Mitigation Measures

As discussed in the setting section above, the Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA-RD-77-108) was used to predict existing and future traffic noise levels for roadways in Sonoma County. Data regarding existing and future traffic volumes were entered into the FHWA model, which then predicted an L_{dn} value at a distance of 50 feet from the roadway centerline. This distance was selected to represent the typical setback of homes from roadways.

Impact 4.4-1 Increased Traffic Noise

Land uses and development consistent with the Draft GP 2020 would result in increased traffic which in turn would result in a substantial increase in noise along certain roadway segments. This would be a significant impact. (S)

Vehicular traffic is the largest contributor to noise levels in unincorporated Sonoma County. With land uses and development consistent with the *Draft GP 2020*, traffic noise would increase in many areas. **Exhibit 7.7-7** in **Appendix 7.7 Noise** lists the predicted traffic noise levels at a distance of 50 feet from the centerlines of the state highways and major county roads in Sonoma County, for both existing and future (i.e., *Draft GP 2020*) conditions. This exhibit also lists the predicted distance from the roadway centerline to the 60 dB L_{dn} contour for *Draft GP 2020* conditions.

Based on **Exhibit 7.7-7** in **Appendix 7.7 Noise**, **Exhibit 4.4-13** lists the roadway segments that would experience increases in traffic noise that would exceed the noise significance criteria listed in **Exhibit 4.4-12**. This determination was made by calculating the difference between the predicted traffic noise levels along each roadway for the existing and the *Draft GP 2020* conditions, comparing the difference to the existing noise level, and determining whether the increase would be significant based on the criteria described by **Exhibit 4.4-12**.

Exhibit 4.4-13
Roadways with Predicted Significant Increases in Traffic Noise

Roadway	Segments
Highway 37	Junction Highway 121 North
US 101	Windsor River Rd to Central Cloverdale / Citrus Fair Dr
Highway 116	Adobe Rd to Arnold Dr
Airport Blvd	E/ Skylane to W/ Faught Rd
Bennet Valley Rd	W/ Grange Rd to W/ Warm Springs Rd
Crane Canyon Rd	E/ Petaluma Hill Rd to E/ Inverness Ave
Dry Creek Rd	N/ Lytton Springs Rd
Fulton Rd	S/ River Rd to N/ River Rd
Grange Rd	S/ Bennet Valley Rd
Leveroni Rd	E/ Arnold Dr to E/ Harrington
Mark West Springs Rd	E/ US 101 to E/ Michele Way
Mountain View Ave	E/ Santa Rosa Ave
Old Redwood Hwy	N/ Mendocino to N/ East Railroad Ave
Petaluma Blvd South	N/ US 101 S/B Off Ramp
Petaluma Hill Rd	N/ Adobe Rd to N/ Snyder Ln
Rohnert Park Expwy	E/ Stony Point Rd to W/ Petaluma Hill Rd
Santa Rosa Ave	S/ Horn Ave to N/ East Robles Ave
Skylane Blvd	N/ Airport Blvd
Stony Point Rd	N/ Highway 116 to N/ Millbrae Ave
Todd Rd	E/ Standish Ave
Warm Springs Rd	N/ Henno Rd

Source: Brown-Buntin Associates, Inc

The Draft GP 2020 includes policies which, if adopted and implemented, would reduce the impact of the increase of traffic noise on new development. Policy **NE-1b** would require the avoidance of noise sensitive land uses in areas where the existing or projected exterior noise levels exceed 60 dB L_{dn} , 60 dB CNEL or the standards in Table NE-2 unless effective measures are included to reduce noise levels. Furthermore, this policy would require that the noise level due to transportation noise sources be reduced to 60 dB L_{dn} in outdoor activity areas (with some exceptions), and that the interior noise levels shall not exceed 45 dB L_{dn} or 45 dB L_{eq} , depending on the affected land use. Policy **NE-1d** would require that noise analyses for new developments consider future traffic or transit conditions in arriving at the predicted future noise levels affecting the project.

Goal **NE-2** of the *Draft GP 2020* would be to confine the noise impacts from transportation facilities (e.g., roads, rail operations, and aircraft overflights) to the smallest feasible land area and to assure that development would be compatible with the level of noise exposure. Policy **NE-2b** would encourage

the installation of noise barriers along roadways in non-industrial urban areas where an exterior noise level of 65 dB L_{dn} or more occurs and residence or other noise sensitive uses exist.

The Noise Element of the *Draft GP 2020*, however, contains no other specific provisions to mitigate noise impacts on existing noise sensitive uses that would be the result of future changes in traffic volumes or of roadway improvement projects. Noise impacts on existing sensitive uses due to traffic caused by future development could be minimized by requiring appropriate mitigation for new land development projects that significantly affect traffic volumes. Similarly, mitigation could be provided for noise impacts caused by new roadways or roadway improvement projects as part of the environmental review process. However, there is currently no mechanism available to mitigate growth-induced increases in traffic noise on a county-wide basis. This would be a significant impact.

In most cases, the only available and appropriate means to mitigate potential impacts that may result from traffic noise increases would be the construction of noise barriers between the road and the impacted land use. Where feasible, the construction of noise barriers is an effective measure to reduce the impact from traffic noise. A noise barrier may be a masonry wall, an earthen berm, or a combination of the two. The height of the barrier would depend on the noise level it is required to mitigate, which in turn is a function of the distance between the road and the impacted land use. The feasibility of implementing this measure would depend on:

- Funding to construct the barrier;
- Physical constraints that may not allow a barrier to be built; and
- The County's ability to impose mitigation requirements on road projects or land uses in other jurisdictions. For example, several of the impacted roads are State Highways under Caltrans' jurisdiction. Sonoma County has no authority to require construction of noise barriers along these State highways.

Policy **NE-2b** would encourage the installation of sound barriers in specified circumstances. However, it would apply only to non-industrial urban areas and would not address other significant noise sensitive land uses that may exist in other areas, such as hospitals and schools.

Mitigation Measure 4.4-1 Revise Policy **NE-2b** to encourage sound barriers along roadways in areas where significant noise sensitive land uses, such as hospitals and schools, exist. Revise **Policy NE-2b** as follows:

Policy NE-2b: Encourage installation of sound barriers along roadways in non-industrial urban areas where an exterior noise level of 65 dB L_{dn} or more is attained and residences or other noise sensitive uses exist. Encourage installation of sound barriers adjacent to roadways in other areas where significant noise sensitive land uses exist.

Significance After Mitigation Adoption of the relevant policies, including the revised Policy **NE-2b**, would reduce the adverse impacts of increased traffic noise on land uses along noise impacted roadway segments. However, due to funding constraints and limited feasibility of sound barriers in some areas, these impacts would not be reduced to a less-than-significant level. Therefore, this would remain a significant impact. (SU)

Responsibility and Monitoring The Board of Supervisors would be responsible for adopting the above policy as part of the *GP 2020*. The PRMD would be responsible for monitoring implementation.

Impact 4.4-2 Impact to Noise Sensitive Development from Roadway Noise

Future noise sensitive development could expose new sensitive receptors to roadway noise levels greater than those considered normally acceptable. This would be a less-than-significant impact. (LTS)

The Noise Element of the *Draft GP 2020* states that noise sensitive land uses include the following:

- Residences
- Schools
- Hospitals and nursing homes
- Churches and libraries
- Long-term medical or mental care facilities
- Other uses deemed noise sensitive by the local jurisdiction

Projected noise levels on several of the roadway segments would extend into areas where noise sensitive land uses might be located in the future and could result in new land uses being exposed to road noise levels in excess of 60 dB L_{dn} . Policy **NE-1a** would direct the designation of areas within Sonoma County as noise impacted if they are exposed to existing or projected exterior noise levels exceeding 60 dB L_{dn} , 60 dB CNEL or the performance standards in Table N-2. Therefore, development that would occur within the 60dB CNEL or L_{dn} traffic noise contours would result in the exposure of persons to noise levels in excess of standards established in the Noise Element. **Exhibit 7.7-7** in **Appendix 7.7 Noise** shows the distance from the center of the road segments studied to the 60 dB L_{dn} contour line. Based on **Exhibit 7.7-7** in **Appendix 7.7 Noise** those areas between the edge of the roadway and the 60 dB contour line would be considered noise impacted.

The *Draft GP 2020* includes policies which, if adopted and implemented, would reduce the traffic noise exposure of this new development. Policy **NE-1b** would require the avoidance of noise sensitive land uses in areas where the existing or projected exterior noise levels exceed 60 dB L_{dn} , 60 dB CNEL or the standards in Table NE-2 unless effective measures are included to reduce noise levels. Furthermore, this policy would require that the noise level be reduced to 60 dB L_{dn} in outdoor activity areas (with some exceptions), and that the interior noise levels not exceed 45 dB L_{dn} or 45 dB L_{eq} , depending on the land use. Policy **NE-1d** would require that noise analyses for new developments consider future traffic or transit conditions in arriving at the predicted future noise levels affecting the project.

Specific mitigation measures appropriate for each new noise sensitive development project would be determined during the environmental review process prior to project approval. However, the combination of Noise Element policies and standards described above would apply to these projects and would ensure that these impacts would be reduced to a less-than-significant level. Noise sensitive projects that do not require environmental review that may occur in close proximity to noise impacted roadways are not expected to be substantial in numbers.

Mitigation Measure 4.4-2 None Required.

Impact 4.4-3 Increased Rail Noise

Existing noise sensitive land uses could be exposed to substantially increased noise levels from rail activity. This would be a significant impact. (S)

Goal **CT-4** of the *Draft GP 2020* would be to reduce future congestion along the US 101 corridor by developing the Sonoma Marin Area Rail Transit (SMART) project. The goal of the SMART project is

to provide passenger train service to Sonoma and Marin County residents along the Northwestern Pacific (NWP) rail corridor that lies next to US 101. Rail service would be provided along a 70-mile corridor extending from Cloverdale through Marin County to a San Francisco bound ferry terminal. Up to 14 station sites are currently assumed along the corridor, nine in Sonoma County and five in Marin County.

An environmental analysis of the SMART project has not yet been completed. It is possible that noise levels from passenger rail operations would exceed the County's noise criteria.

The SMART project could increase noise levels along the existing (but unused) NWP rail corridor within the unincorporated area of Sonoma County as well as the cities of Cloverdale, Healdsburg, Windsor, San Rosa, Rohnert Park, Cotati, and Petaluma. Noise sources associated with the SMART project would include the train engines, wheel squeals, train whistles, and stationary crossing bells.

The SMART environmental document will assess potential noise and vibration impacts. Because of the uncertainties associated with operational details, no comprehensive noise predictions can be included in this EIR and further discussion of potential impacts of increased rail noise would be speculative. It should be noted, however, that although SMART is not subject to noise standards contained in the Sonoma County General Plan, compliance with Policy **NE-1b** would mean that the noise level due to transportation noise sources would have to be reduced to 60 dB L_{dn} in outdoor activity areas (with some exceptions), and that the interior noise levels could not exceed 45 dB L_{dn} or 45 dB L_{eq} , depending on the affected land use. Application of this policy to the SMART project would help ensure that appropriate mitigation measures would be incorporated into the project to reduce potential noise impacts to an acceptable level.

Mitigation Measure 4.4-3 No mitigation would be available to the County beyond the *Draft GP 2020* policies discussed in the impact analysis above. Mitigation of noise impacts resulting from the implementation of the SMART rail project would be the responsibility of the SMART District.

Significance After Mitigation This would be a significant unavoidable impact. (SU)

Impact 4.4-4 Impact to Noise Sensitive Development from Stationary Noise Sources

Existing and future noise sensitive development could be exposed to increased noise levels from new noise generating development greater than those considered normally acceptable. This would be a less-than-significant impact. (LTS)

Potential stationary noise sources include activities associated with existing and new commercial / industrial land uses. These include the existing stationary noise sources described in the setting section and include major industrial facilities such as mineral resource extraction and processing, facilities such as Redwood Empire Remanufacturing and Reuser Inc, wineries, and geothermal development. The location of new development could place new noise sources such as industrial or commercial land uses in close proximity to noise sensitive land uses, such as residential. In addition, development of new noise sensitive land uses (e.g., residential land uses) could place them in close proximity to existing or proposed commercial and industrial land uses. Noise conflicts could arise due to these juxtapositions of potentially incompatible land uses.

The *Draft GP 2020* Industrial Use Policy (i.e., Section 2.4 of the Land Use Element) would provide that some lands designated in industrial land use categories would also be available for development of affordable housing projects.

As a part of the actions necessary to implement the *Draft GP 2020*, it is proposed to amend the *Sonoma County Zoning Code* to include an Affordable Housing (AH) Combining District. The purpose of the AH Combining District would be to implement Policy **HE-3o** of the Housing Element of the *Draft GP 2020*, by identifying under-utilized commercial, industrial, or residential lands, within the county's Urban Service Areas. Such lands could be developed for housing affordable to Low and Very-Low income households to increase the supply of affordable housing to county residents.

Furthermore, both General Industrial and Limited Industrial land use categories would permit one caretaker unit per lot or residential use which is part of an integrated, live-work or mixed residential/industrial project.

For most of the land uses permitted by the Land Use Element, mitigation of potential noise impacts would be assured by implementation of the Noise Element's goals, objectives, and policies. Policy **NE-1b** would require the avoidance of noise sensitive land uses in areas where the existing or projected exterior noise levels exceed 60 dB L_{dn} , 60 dB CNEL or the standards in Table NE-2 unless effective measures are included to reduce noise levels. Furthermore, this policy would require that the noise level due to transportation noise sources be reduced to 60 dB L_{dn} in outdoor activity areas (with some exceptions), and that the interior noise levels shall not exceed 45 dB L_{dn} or 45 dB L_{eq} , depending on the affected land use.

Policy **NE-1c** would control non-transportation related noise from new projects. This policy would require that new projects with non-transportation noise sources comply with the noise standards of Table NE-2, as measured at the exterior boundary of any affected existing or reasonably foreseeable noise-sensitive land use. The noise standards of Table NE-2 are tiered, to allow longer exposure to lower noise levels than at higher noise levels. The noise standards are intended to be consistent with the ambient noise levels measured in typical noise sensitive areas, as documented in the setting section above and in the Noise Element Technical Reference Document.⁷ Compliance with the Table NE-2 noise standards would ensure that the resulting noise levels would be within acceptable limits for Sonoma County residents, and would not allow a significant increase in ambient noise levels.

Policy **NE-1c** would allow the standards of Table NE-2 to be adjusted based on ambient noise levels, and to account for annoying characteristics of noise, such as pure tones and impacts. In addition, the policy would allow a conditional exception for noise-producing events that would occur a limited number of times per year (e.g., special events held at a winery or visitor service facility), recognizing that noise from such events is likely to be less annoying than noise from continuously-occurring activities.

Section 2.4 Industrial Use Policy of the *Draft GP 2020* Land Use Element includes both General Industrial (GI) and Limited Industrial (LI) land uses. This policy includes a requirement that, with exception of caretakers' residences, residential uses in industrial areas would be permitted subject to the approval of a master site plan where noise has been adequately addressed. This process would allow imposition of noise standards consistent with the Noise Element of the *Draft GP 2020*.

The development of housing as permitted by the AH Combining District could introduce noise sensitive land uses to a noise environment more typical of urban areas, where ambient noise levels are typically higher than in rural or undeveloped areas.

⁷ The *Technical Reference Document Noise Element of the General Plan* is available for review at the PRMD office.

In order to meet the exterior and interior noise levels specified in the Noise Element, including Policy **NE-1b**, it would be necessary in most cases to incorporate specific noise mitigation measures into certain projects. Such measures could include noise barriers to meet the exterior noise limits and / or mechanical ventilation of buildings so that windows could be closed to achieve interior noise levels. Such measures would be determined upon review of the project. Implementation of Policy **NE-1b** and other policies noted above would reduce this impact to a less-than-significant level.

Mitigation Measure 4.4-4 None Required.

Impact 4.4-5 Airport Noise

Air operations at Sonoma County Airports consistent with levels projected by the Draft GP 2020 Air Transportation Element could result in increased noise levels to surrounding areas including residential land uses. However, policies and programs contained in the Draft GP 2020 Noise and Air Transportation Elements would reduce this to a less-than-significant impact. (LTS)

The Air Transportation Element (ATE) establishes the projected growth of air traffic in Sonoma County and shows the predicted locations of the CNEL contours for each airport. The *Draft GP 2020 ATE* primarily uses 2010 projections of air operations and corresponding noise contour maps taken from the 2001 Sonoma County Comprehensive Airport Land Use Plan (CALUP).⁸ Projected levels of air operations for the six Sonoma County Airports are described in Table AT-3 of the *Draft GP 2020 ATE*.

The *Draft GP 2020 ATE* projects the same level of the air operations as the CALUP for the Cloverdale, Healdsburg, Petaluma, Sonoma Skypark, and Sonoma Valley airports. Therefore, the use of the CALUP noise contour maps for conditions in 2010 would be appropriate for modeling noise levels at these airports through 2020.⁹

In addition to projecting levels of air operations, the *Draft GP 2020 ATE* and CALUP would apply noise standards to new residential developments that have a more restrictive impact threshold than those of the Noise Element. Specifically, the ATE provides in Objective **AT-1.3**, that, for new residential uses near airports, an aircraft noise exposure of 55 dB CNEL or less is acceptable, and that an aircraft noise exposure between 55 and 65 dB CNEL is conditionally acceptable. An aircraft noise exposure exceeding 65 dB CNEL would be unacceptable. Since the ATE and Noise Element contain policies (discussed later in this section) that would ensure mitigation for residential development outside the 65 dB CNEL contour, the threshold of noise impacts for airports in Sonoma County is 65 dB CNEL.

⁸ *Sonoma County Comprehensive Airport Land Use Plan (CALUP)*, January, 2001.

⁹ According to the Caltrans California Airport Land Use Planning Handbook, “because of the many variables and assumptions associated with their computation, cumulative noise contours representing *existing* airport activity are often considered to have a precision of approximately ± 3 dB. Greater precision (within ± 1 dB) can be obtained at airports where flight track data is available from radar and / or a permanent noise monitoring system is installed. In any case, precision is greatest close to the runway and decreases beyond where flight tracks diverge. As imprecise as this modeling of current noise contours can sometimes be, contours representing projections of *future* noise impacts are inherently even less precise.” The Air Transportation Element is expected to be updated in 2007 at which time new noise contour maps for county airports would presumably be generated.

With respect to commercial passenger airline operations at Sonoma County Airport, the projected level of commercial passenger air operations would reach 5,000 annual commuter operations and 10,200 scheduled airline operations by 2020. Currently, there are no commercial air carriers operating at the airport. Commuter aircraft are typically turboprop aircraft, producing relatively low noise levels. Scheduled airlines typically use jet aircraft. The current trend in California is that scheduled airlines introduce air carrier service to small airports using regional jets, such as the Canadair 200/700 and the Embraer 135 / 145. These aircraft are relatively small (up to 70 passengers), and produce relatively low noise levels as compared to other jets. However, they do produce higher noise levels than turboprop aircraft.

Without knowing the fleet mix assumptions for the 2010 and 2020 forecasts, one cannot reasonably predict whether the projected differences in operations in 2020 would significantly change the size of the CNEL contours as compared to those prepared for the 2010 forecast. However, since ATE noise contours and policies limit the noise generated by commercial operations and since these operations are the primary factor in establishing the projected noise contours, the maximum level of operations allowed at the airport would not likely exceed the CNEL contour.

With respect to general aviation operations, noise levels at the Sonoma County Airport would be expected to increase as the *Draft GP 2020* ATE predicts 30,000 more General Aviation operations than does the CALUP (240,000 vs. 210,000). Unlike commercial jet aircraft, the noise levels produced by average, propeller-driven, airplanes used in general aviation operations have not changed appreciably over the years. The potential for future technological improvements is limited. Moreover, small, private airplanes tend not to be replaced with newer models at anywhere near the rate common to airline aircraft. Thus, for many years to come, the noise impacts of typical propeller airplanes are likely to remain little different from what they are now. ¹⁰

However, if the overall fleet mix at the airport were to remain consistent with those of the CALUP, but the number of general aviation operations were to increase by 30,000 operations, or by about 13 percent, the predicted change in the CNEL values would increase by less than one decibel. As a point of reference, a doubling of operations would be required to create an increase of three dB CNEL.

The *Draft GP 2020* contains policies that would reduce the noise impact of airport operations consistent with levels described in the ATE on noise sensitive development. Noise Element Policy **NE-1b** would apply a noise impact threshold of 60 dB CNEL, and would allow development of noise sensitive uses in aircraft noise environments up to 65 dB CNEL if it were not possible to meet the 60 dB CNEL standard. Both the ATE and the Noise Element would allow noise sensitive development up to 65 dB CNEL, provided an interior noise standard of 45 dB CNEL is satisfied. Both the ATE and Noise Element policies would prohibit residential development in areas exposed to more than 65 dB CNEL.

ATE Policies **AT-3b**, **AT-3c** and **AT-3d** would regulate the single event noise levels produced by aircraft operating at Sonoma County Airport. Policy **AT-3e** would encourage the use of Stage 3 aircraft by new scheduled air carriers. ¹¹ These measures would minimize the contributions of new scheduled air carrier operations to the CNEL exposures in the airport environs. In addition, the

¹⁰ *California Airport Land Use Planning Handbook*, Caltrans, 2002.

¹¹ In practice, this policy would have little effect, since Stage 2 aircraft are no longer in the national air carrier fleet.

nighttime single event noise standard in Policy **AT-3c** would limit annoyance and sleep disturbance in residential areas where aircraft over flights occur.

Policies **AT-5a** through **AT-5e** would regulate scheduled air carrier operations at Sonoma County Airport. At such a time as the average annual traffic volume exceeds 650 enplaned passengers per day, Policy **AT-5f** would require Board of Supervisors review of noise impacts.

In addition, implementation of Air Transportation Program 5 contained in the *Draft GP 2020 ATE* would require PRMD to prepare an Approach Protection Zone that would implement the Sonoma County Comprehensive Airport Land Use Plan (CALUP) by identifying lands that are subject to its policies and regulations. County staff would provide notification to property owners and developers of possible land use restrictions on applicable lands associated with the CALUP.

The ATE does not include any policies that would directly mitigate the environmental impact of aircraft noise exceeding 65 dB CNEL at an incompatible (i.e., noise sensitive) land use. However, the California Airport Noise Regulation (CCR Title 21, Subchapter 6) would require that the airport operator ensure that all land uses would be compatible within the 65 dB CNEL contour. This regulation would be enforced by Sonoma County.

Implementation of the ATE standards for residences between the 55 dB and 65 dB CNEL contours would require that an acoustical analysis be prepared to demonstrate that the building facades would provide an aircraft noise level reduction (NLR) adequate to satisfy the interior noise standard of 45 dB CNEL. Standard energy-conserving residential building practices may be expected to provide an aircraft NLR of 20 to 25 dB, assuming that windows and doors are closed. Therefore, satisfaction of the 45 dB CNEL interior noise standard would be practical for most residences in the ATE noise impact area, assuming modern County-approved construction practices. For residences with extraordinarily large window surface areas, acoustical glazing could be required to meet the interior noise standard, but it is expected that the standard could be readily achieved. The ATE standards provide no other restrictions on residential development where the exterior noise level is below 65 dB CNEL. Therefore, satisfaction of the interior noise standard would mitigate the noise impact upon residential developments with a noise exposure less than 65 dB CNEL.

LAND USE IMPLICATIONS

The 55 dB and 60 dB CNEL contours for the Sonoma County Airport contained in the ATE include existing residential land uses in Sonoma County and the Town of Windsor. Implementation of the more restrictive noise standard proposed in the *Draft GP 2020 ATE* would result in an additional 7.71 square miles (the amount of land within the 55 and 60 dB contours) being placed within the “conditionally acceptable” category.¹² The 65 dB CNEL contour includes lands designated for commercial, industrial, transportation and utilities uses as well as for agricultural and resource development. No lands within the 65 dB CNEL contour are designated for residential development, so no noise impacts would be expected to occur.

Land use changes and environmental review would be required prior to residential development of the unincorporated lands within the expanded “conditionally acceptable” designated area (within the 55 dB and 60 dB CNEL contours) adjacent to the Sonoma County Airport, though individual residences

¹² *Sonoma County Comprehensive Airport Land Use Plan (CALUP)*, January, 2001.

could be built on existing parcels with suitable zoning. Noise effects on these residences would be mitigated by the policies of the ATE and the Noise Element.

Using the ATE CNEL contours, one may evaluate the effects on land use compatibility in the airport environs by considering the land uses contained in the projected 65 dB CNEL contour. If the airport were to realize the growth anticipated by the 2020 forecast, these areas would experience an increase in noise levels, but the noise levels would not be likely to exceed the criterion value of 65 dB CNEL, or extend this noise contour outward.

According to the base maps provided in the ATE, (see Figures AT-4 through AT-9 of the ATE of the *Draft GP 2020*) there would be no significant noise impacts due to projected future aircraft noise contours for the Cloverdale, Healdsburg, Sonoma Skypark, and Sonoma Valley airports. For the Petaluma Airport however, the future 55 dB and 60 dB CNEL contours would include existing residential land uses in the city of Petaluma. The 65 dB CNEL contour would be immediately adjacent to existing residences in the city of Petaluma. Land use changes and environmental review would be required prior to residential development of the unincorporated lands within the 65 dB CNEL contour. Noise effects on these residences would be mitigated by the policies of the ATE and the Noise Element. Therefore no additional noise impacts are expected within the unincorporated portion of Sonoma County.

Airport noise impacts would be adequately reduced by the implementation of policies contained in the both Air Transportation and Noise Elements of the *Draft GP 2020*, as well as by the California Airport Noise Regulation. Therefore, this would be a less-than-significant impact and no mitigation would be required.

Mitigation Measure 4.4-5 None Required.