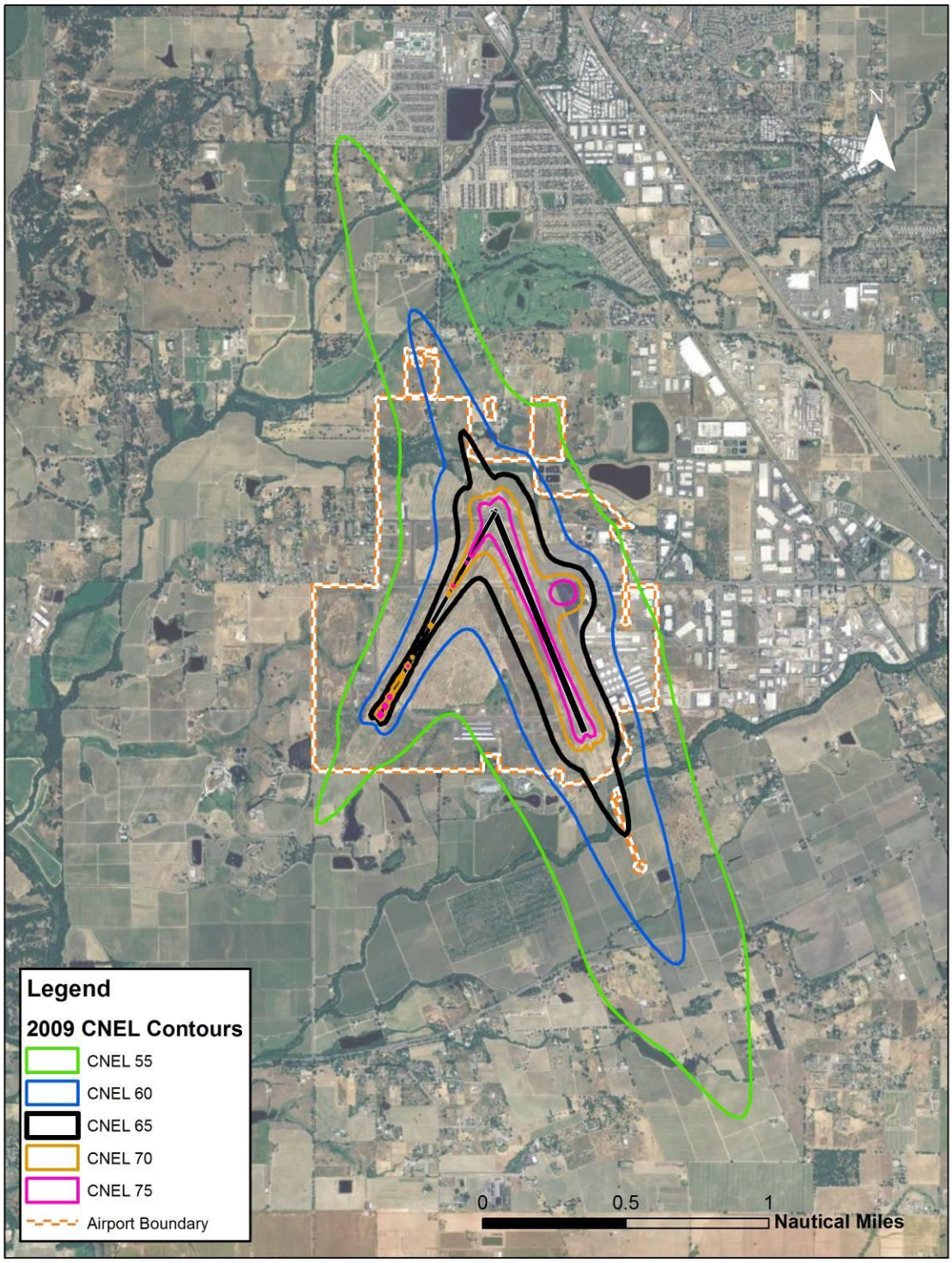
Figure 4-3
BASELINE 2009 CNEL CONTOURS



SOURCE: MGA/L&B (2011)

4.7 NOISE RECEPTOR SITES

Noise modeling results can be expressed in tabular format in terms of CNEL at specific representative locations. INM Version 7.0b was used to determine the noise levels at receptor sites in the environs of the Airport. A list of these locations is presented in Table 4-9 and graphically depicted in Figure 4-4. These noise receptor sites represent noise sensitive areas at the residential areas closest to the Airport and underneath flight paths. . A noise sensitive area includes residential, educational, health, and religious structures and sites, and parks, recreational areas (including areas with wilderness characteristics), wildlife refuges, and cultural and historical sites. Although Sites 1, 2, and 4 are not located in areas classified as noise sensitive land use, they are adjacent to the closest residential areas to the Airport. The modeled noise levels at the noise receptor sites for Baseline 2009 are shown in Table 4-10.

Table 4-9
NOISE RECEPTOR SITES

Receptor Sites	Name	Land Use	Latitude	Longitude
1	Airport Property East	Airport	38.523521	-122.818619
2	Airport Property West	Airport	38.521286	-122.808591
3	Triple Oak Way	Residential	38.483326	122.787684
4	Cutrer Winery	Commercial	38.498762	-122.832633
5	Rio Ruso Dr	Residential	38.556559	-122.821350
6	Windsor High School	School	38.541974	-122.820859
7	Mitchell Ln	Residential	38.532424	-122.803425
8	Trione Cir	Residential	38.534734	-122.815327
9	Olivet Rd	Residential	38.478978	-122.819909
10	Piner High School	School	38.462467	-122.767275

SOURCE: MGA/L&B (2011)

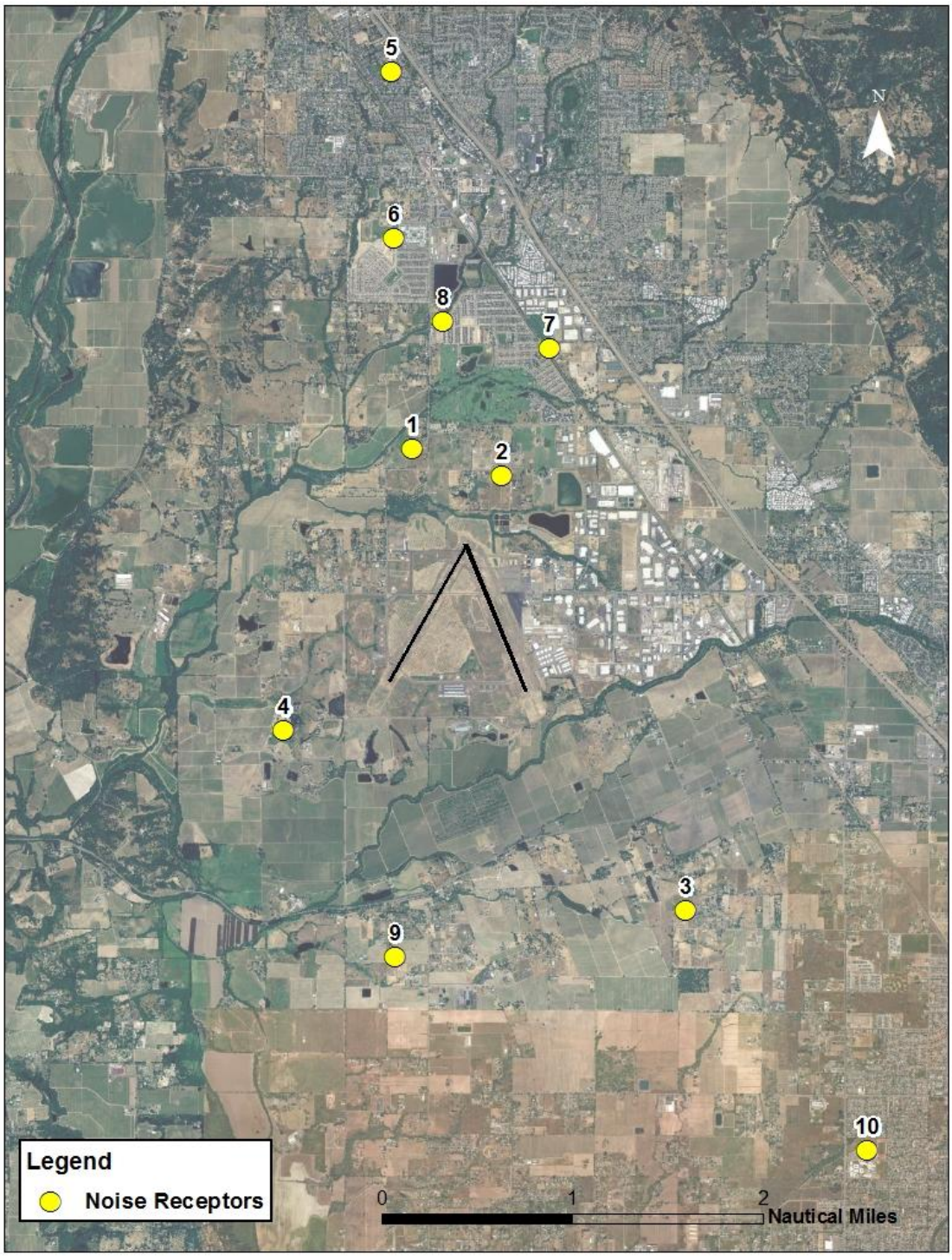
Table 4-10

NOISE RECEPTOR MODELED CNEL NOISE LEVELS – BASELINE 2009

Receptor Sites	Name	Land Use	2009 CNEL (dB)
1	Airport Property East	Airport	59.4
2	Airport Property West	Airport	55.2
3	Triple Oak Way	Residential	50.9
4	Cutrer Winery	Commercial	47.3
5	Rio Ruso Dr	Residential	44.6
6	Windsor High School	School	49.9
7	Mitchell Ln	Residential	47.8
8	Trione Cir	Residential	50.1
9	Olivet Rd	Residential	47.8
10	Piner High School	School	43.2

SOURCE: MGA/L&B (2011)

Figure 4-4
NOISE RECEPTOR SITE MAP



SOURCE: MGA/L&B (2011)

4.7.1 Noise Measurements at Noise Receptor Sites

Onsite noise measurements were performed at each noise receptor site during August 2009. The measurements lasted approximately 3 days at receptor sites 1-4 and lasted a few hours at receptor sites 5-10. (Due to limited resources, the common practice during temporary noise measurements is to select some sites for 24-hour CNEL measurement and some sites for measurements that last a few hours for single event and background measurements). Sites 1-4 were selected for CNEL measurement because they were the closest to the airport and at secured, fenced-in locations. The sound level meters used to determine the noise levels were Brüel & Kjær meters, which comply with specific International Standards (IEC) and measurement standards established by the American National Standards Institute (ANSI) for Type I instrumentation (Type I refers to the definition of a Precision Sound Level Meter, the most accurate classification of a sound level meter). Noise events that exceeded the sound level threshold of 65 dB for duration longer than 3 seconds were classified as aircraft noise events and used to calculate aircraft CNEL at noise receptor sites 1-4. Noise events at sites 5-10 were classified as aircraft noise events by matching them with actual aircraft operations observed by a technician at each noise receptor site.

4.7.2 Ambient Noise at Noise Receptor Sites

The data collected during the measurements can be summarized as a noise environment in terms of the noise level exceeded 10%, 50%, and 90% of the time and designated as ($L_{percentage}$) L_{10}, L_{50}, L_{90}, respectively. The L_{10} is the noise level exceeded 10% of the time and represents the typical peak noise level. The L_{50} is the median noise level. L_{90} is the noise level exceeded 90% of the time. The L_{90} is a good approximation of the background noise level, i.e., the noise level that would occur in the absence of identifiable noise events. Table 4-11 lists the L_{10}, L_{50}, and L_{90} levels at each noise receptor location.

Table 4-11
AMBIENT NOISE LEVELS BY NOISE RECEPTOR SITE

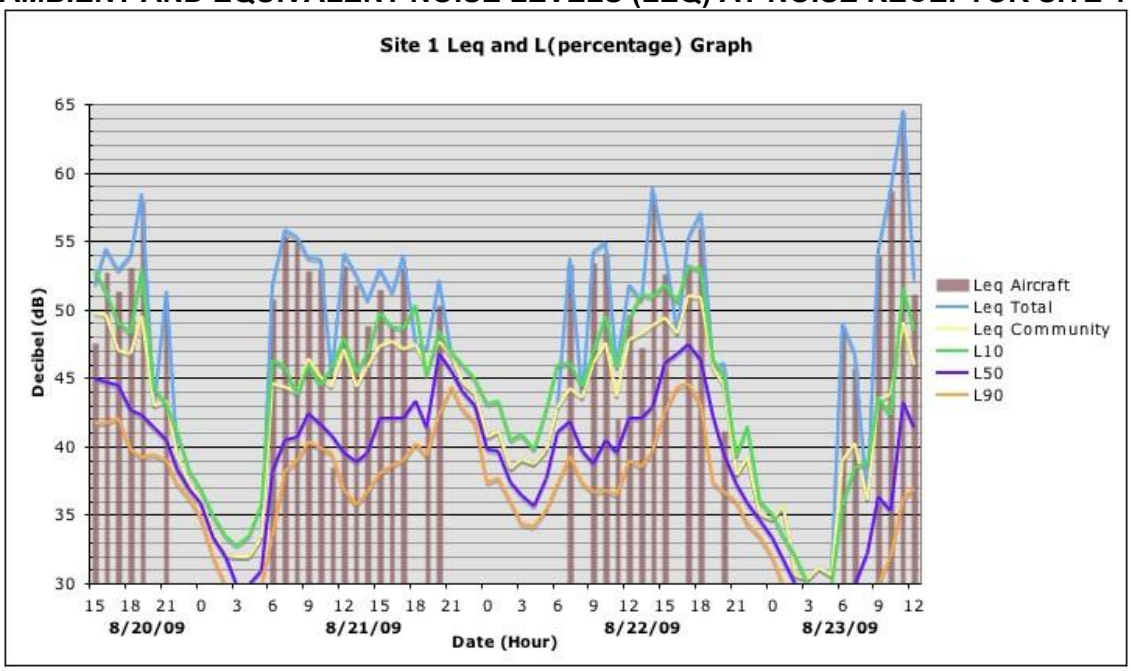
Receptor Sites	Name	Land Use	L_{10} (dB)	L_{50} (dB)	L_{90} (dB)
1	Airport Property East	Airport	47.5	40.8	34.7
2	Airport Property West	Airport	47.7	40.8	34.4
3	Triple Oak Way	Residential	48.1	39.3	34.2
4	Cutrer Winery	Commercial	50.4	47.9	45.9
5	Rio Ruso Dr	Residential	56.2	49.0	44.4
6	Windsor High School	School	51.8	45.7	43.1
7	Mitchell Ln	Residential	50.1	46.5	44.2
8	Trione Cir	Residential	52.2	44.8	39.7
9	Olivet Rd	Residential	45.5	37.9	35.3
10	Piner High School	School	50.5	45.3	41.7

SOURCE: MGA/L&B (2011)

Figures 4-5a through 4-5j illustrate the Aircraft Leq, Community Leq, Total Leq, and the $L_{percentage}$ levels per hour during the measurement periods at each noise receptor site.

Figure 4-5a

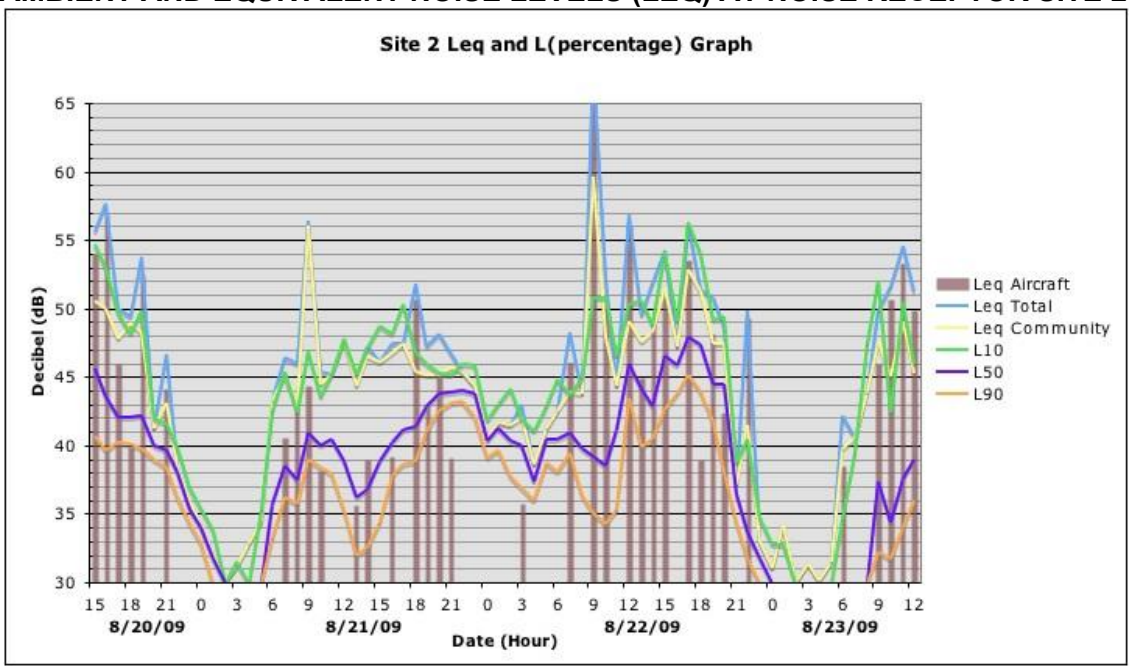
AMBIENT AND EQUIVALENT NOISE LEVELS (LEQ) AT NOISE RECEPTOR SITE 1



SOURCE: MGA/L&B (2011)

Figure 4-5b

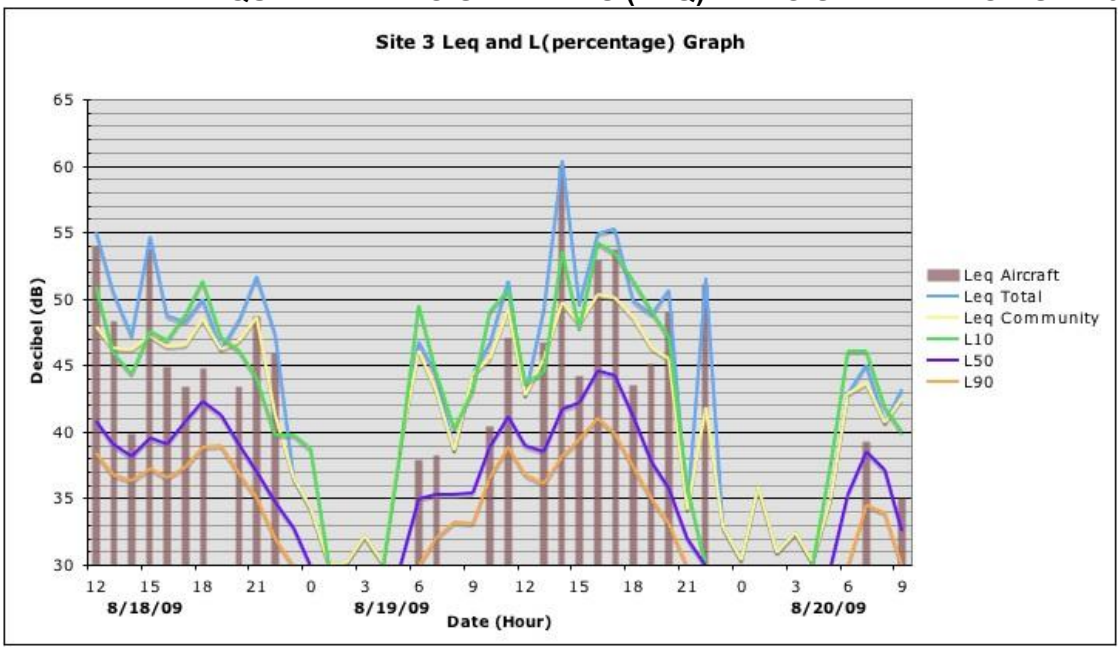
AMBIENT AND EQUIVALENT NOISE LEVELS (LEQ) AT NOISE RECEPTOR SITE 2



SOURCE: MGA/L&B (2011)

Figure 4-5c

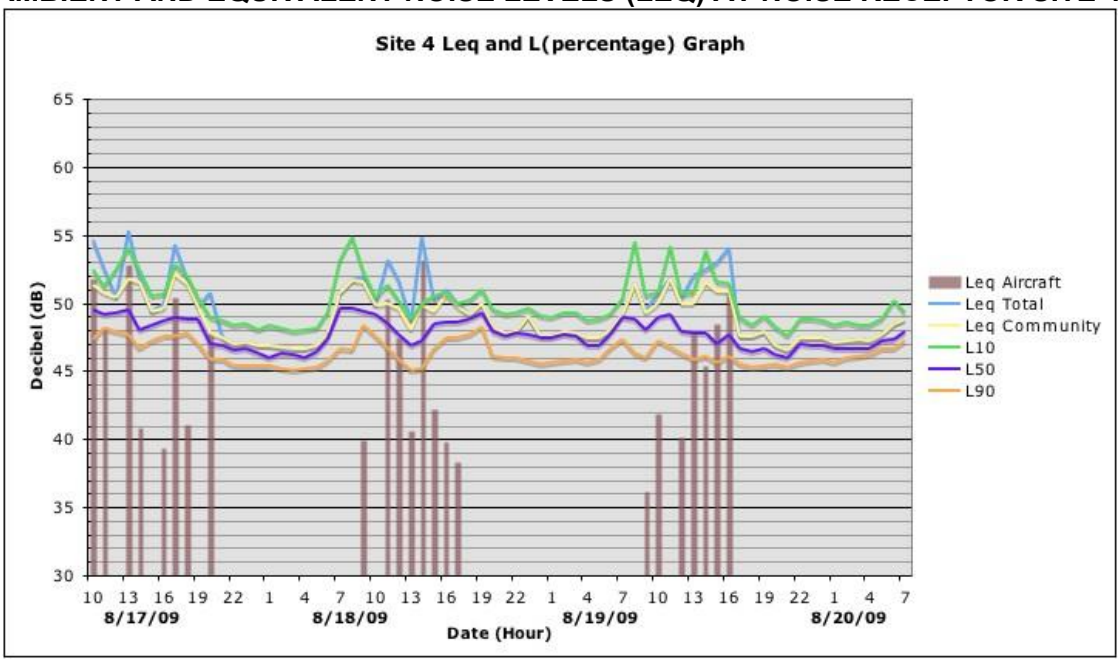
AMBIENT AND EQUIVALENT NOISE LEVELS (LEQ) AT NOISE RECEPTOR SITE 3



SOURCE: MGA/L&B (2011)

Figure 4-5d

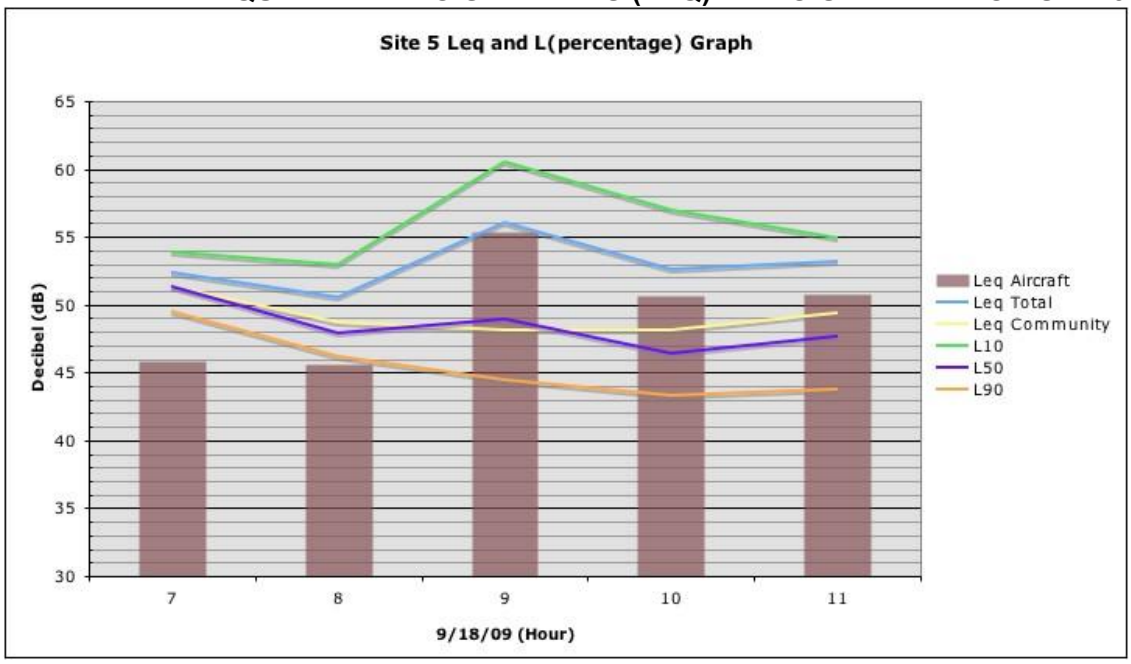
AMBIENT AND EQUIVALENT NOISE LEVELS (LEQ) AT NOISE RECEPTOR SITE 4



SOURCE: MGA/L&B (2011)

Figure 4-5e

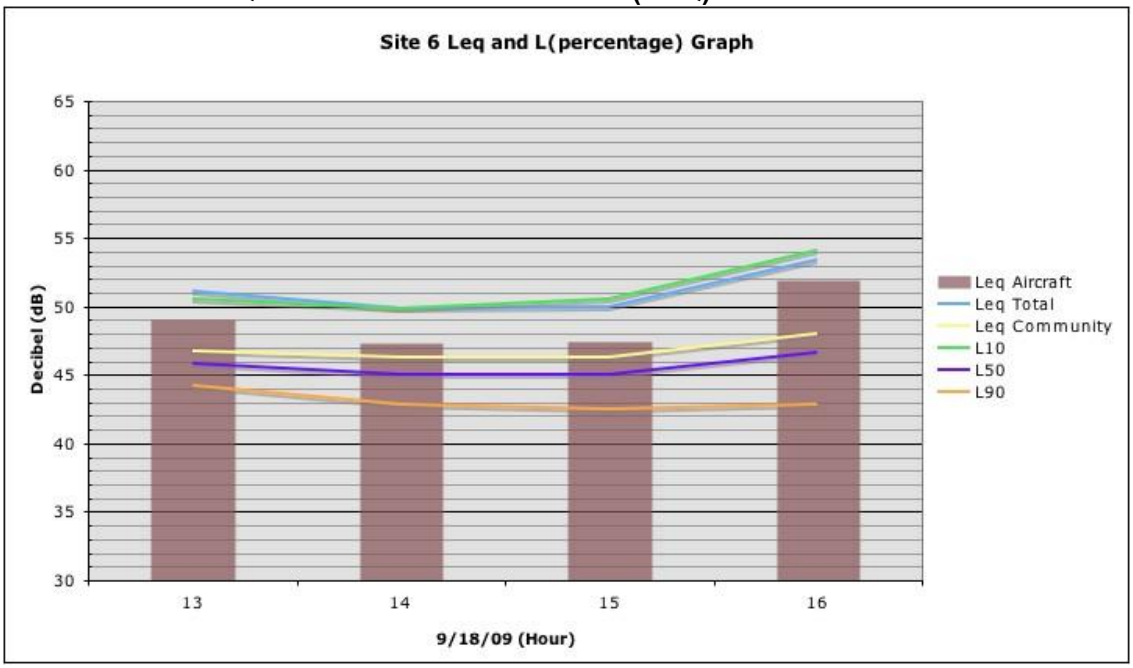
AMBIENT AND EQUIVALENT NOISE LEVELS (LEQ) AT NOISE RECEPTOR SITE 5



SOURCE: MGA/L&B (2011)

Figure 4-5f

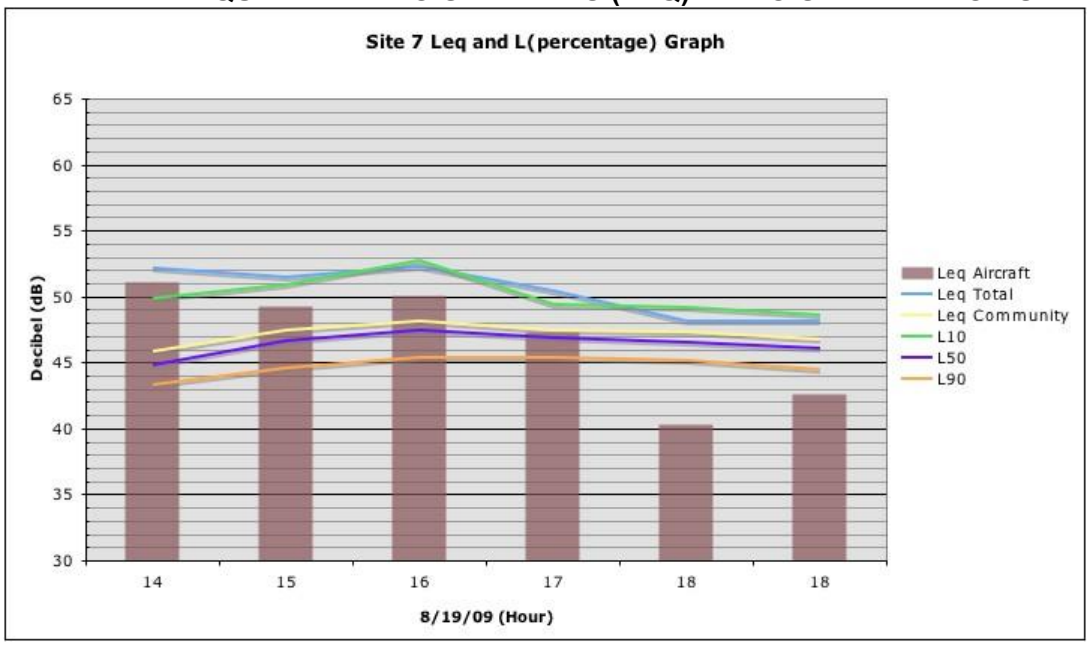
AMBIENT AND EQUIVALENT NOISE LEVELS (LEQ) AT NOISE RECEPTOR SITE 6



SOURCE: MGA/L&B (2011)

Figure 4-5g

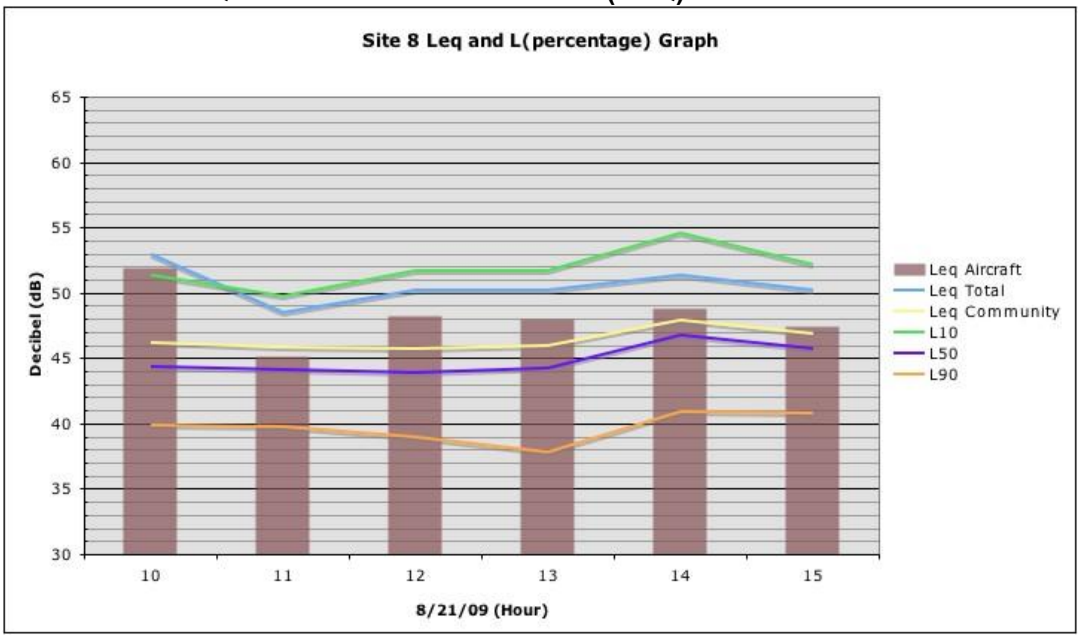
AMBIENT AND EQUIVALENT NOISE LEVELS (LEQ) AT NOISE RECEPTOR SITE 7



SOURCE: MGA/L&B (2011)

Figure 4-5h

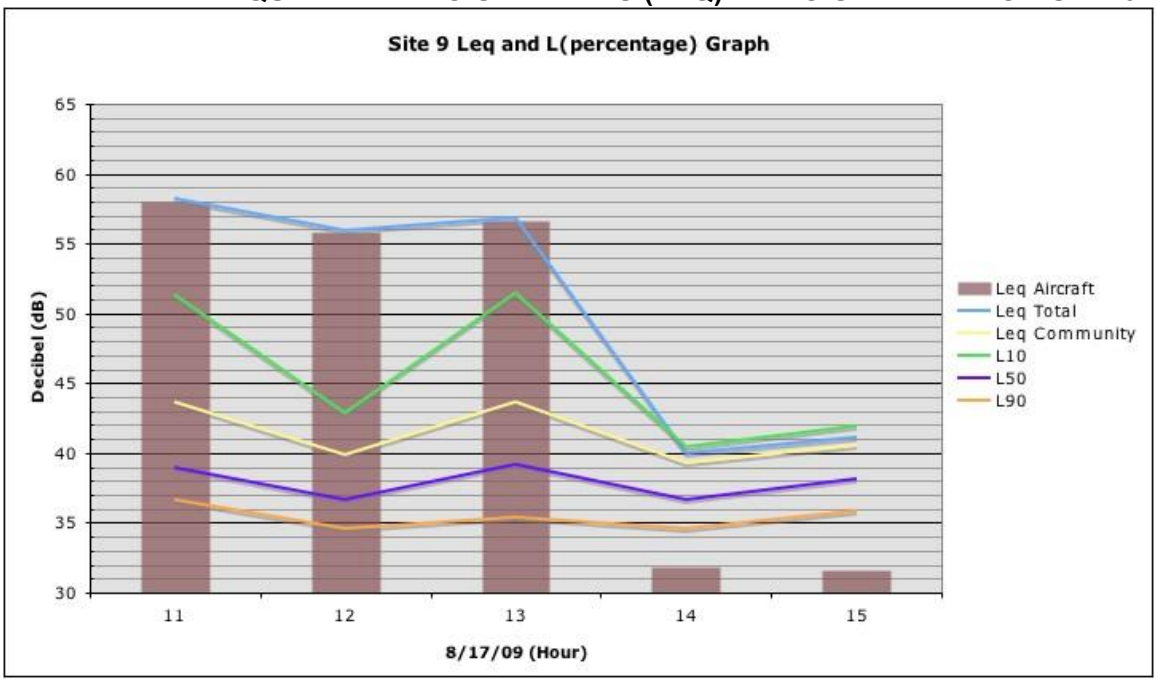
AMBIENT AND EQUIVALENT NOISE LEVELS (LEQ) AT NOISE RECEPTOR SITE 8



SOURCE: MGA/L&B (2011)

Figure 4-5i

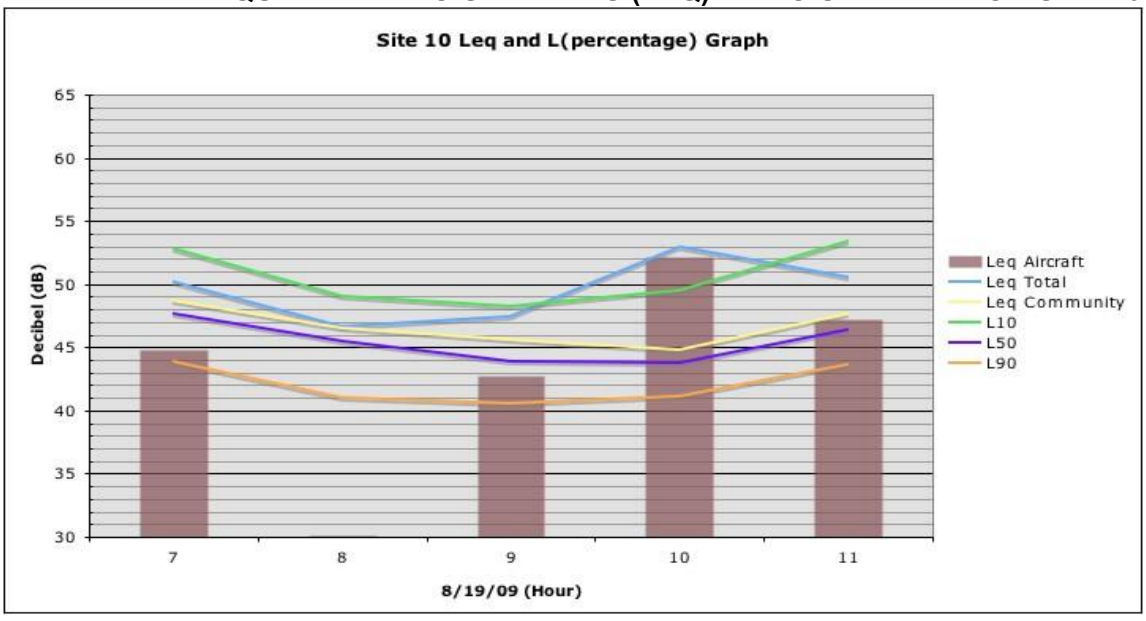
AMBIENT AND EQUIVALENT NOISE LEVELS (LEQ) AT NOISE RECEPTOR SITE 9



SOURCE: MGA/L&B (2011)

Figure 4-5j

AMBIENT AND EQUIVALENT NOISE LEVELS (LEQ) AT NOISE RECEPTOR SITE 10



SOURCE: MGA/L&B (2011)

4.7.3 CNEL at Noise Receptor Sites

The noise measurement data were used to compute CNEL at noise receptor sites 1-4. The measurement periods at noise receptor sites 5-10 lasted a few hours and not the necessary 24-hour duration necessary to calculate CNEL. An aircraft only, a community (non-aircraft), and a total CNEL were calculated for each site. The aircraft CNEL was calculated from all one-second data that was recorded at each site during an aircraft noise event. The community CNEL was computed from all one-second data that were recorded at each site when there were no aircraft noise events. These CNEL values of a few days of measurements should not be compared to an annual average CNEL value because, during the measurements, the aircraft types, runway utilization, and wind conditions may not have been the same as those used to calculate the annual average CNEL. The results are shown below in Table 4-12.

Table 4-12
CNEL AT NOISE RECEPTOR SITES 1 THRU 4

Receptor Sites	Name	Land Use	Aircraft CNEL (dB)	Community CNEL (dB)	Total CNEL (dB)
1	Airport Property East	Airport	54.6	50.4	56.0
2	Airport Property West	Airport	53.1	51.3	55.4
3	Triple Oak Way	Residential	49.9	48.2	52.2
4	Cutrer Winery	Commercial	51.6	56.5	57.7

SOURCE: MGA/L&B (2011)

5.1 FUTURE CONDITIONS

This section documents the analysis of aviation related noise exposure for the No Project Alternative and the Proposed Project at the Airport.

The Proposed Project extends Runway 14 by 885 feet to the northwest and extends Runway 19 by 200 feet to the north. The runway ends to Runways 32 and 1 do not change. These runway extensions change the location of the aircraft arrival touch-down point and the location of the beginning of take-off roll on Runways 14 and 19 relative to the existing runway conditions.

Years 2015 and 2030 were selected as the forecast years to analyze future impact at the Airport. Noise contours for each alternative were calculated for the forecast years.

5.2 FUTURE OPERATIONS

The number of future operations and aircraft types required to meet future aviation demand at the Airport were determined by analysis of historical aviation demand, projected future demand, and existing national trends, such as airline purchases and options on future aircraft and the planned retirement of existing aircraft. The forecast, prepared by Mead & Hunt, includes generalized Operator Category operations and does not include details such as the number of operations by specific aircraft types. Factors such as the existing fleet mix and aircraft load

factors specific to the Airport were used to tailor the generalized forecast data into detailed operations data for input into the Integrated Noise Model.

Based on the forecast, Air Carrier, Air Taxi, and General Aviation operations at the Airport will increase in 2015 and 2030 relative to 2009. Future operations and fleet mix data for 2015 and 2030 are presented in Table 5-1.