Noise Assessment

For The

MORONGO OUTDOOR ENTERTAINMENT FACILITY

MORONGO INDIAN RESERVATION

Prepared For:

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1.0 EXISTING SETTING

1.1 Project Description

The proposed Morongo Outdoor Entertainment (MOE) facility is a music and events venue on 310+/- overall acres consisting of a variety of different venues including a main, open air amphitheater seating 15,000 to 18,000 persons, a sprung structure (tent) of 80,000 square feet with a capacity of 10,000 persons, a Beach Club with a capacity of 2,500 persons, and an "Electric Forest" venue featuring a heavily landscaped area interspersed with small performance areas for approximately 500 patrons (Exhibit 1). All of these venues could be operating simultaneously for festivals but many of the events anticipated would only use the main amphitheater, the Beach Club or the tent venue.

The Beach Club could be used as an adjunct to either venue and can also operate as a stand-alone facility and could be open daily. An event concourse area of approximately 8.5 acres will interconnect all of the musical venues and offer retail sales, food, activity areas and related offerings. In addition, there are open, grassed festival/flex areas of approximately 21 acres that could be used to support festivals, exhibits and other event activities. The core area housing the music/events venues and related activity areas comprises the 68 acres of the 310 acre site being leased for the project. The remaining 242 acres is being made available by the Tribe for parking and camping as well as access and infrastructure development.

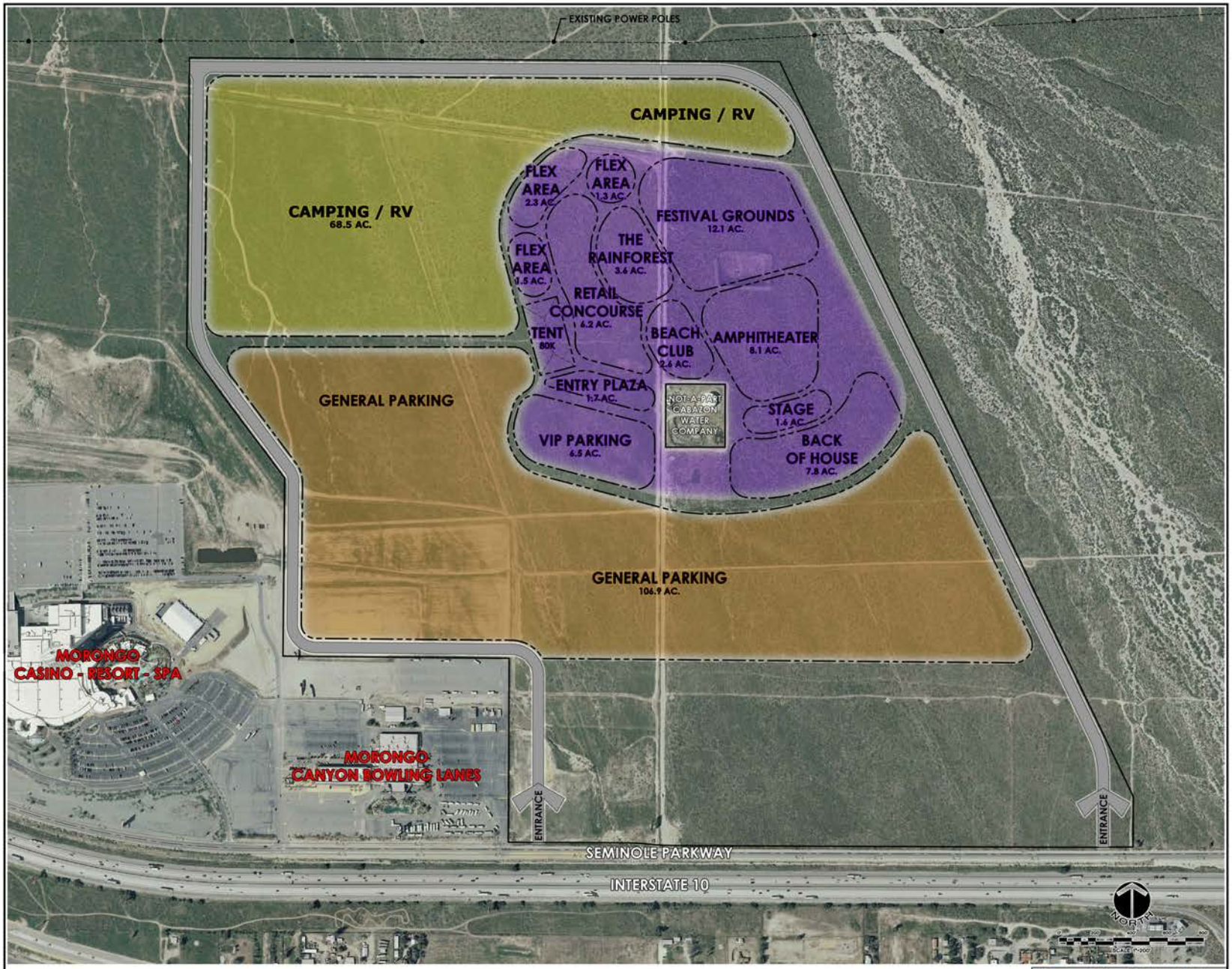
In addition to the music/events venues, the site would propose approximately 11,000 spaces for car parking plus parking for 200 buses. Camping and RV parking areas are also provided for approximately 3,200 spaces including that much additional parking. The camping is only available during events and is not open for public use otherwise. For events without camping, those areas can be used to supply approximately 6,000 additional parking spaces.

This report assesses the potential noise impacts of the project on the surrounding land uses. construction noise, parking lot/camping noise, increases in traffic noise, and band/crowd noise are considered.

1.2 Background Information on Noise

1.2.1 Noise Criteria Background

Sound is technically described in terms of the loudness (amplitude) of the sound and frequency (pitch) of the sound. The standard unit of measurement of the loudness of sound is the decibel (dB). Decibels are based on the logarithmic scale. The logarithmic scale compresses the wide range in sound pressure levels to a more usable range of numbers in a manner similar to the Richter scale used to measure earthquakes. In terms of human response to noise, a sound 10 dB higher than another is judged to be twice as loud; and 20 dB higher four times as loud; and so forth. Everyday sounds normally range from 30 dB (very quiet) to 100 dB (very loud).



MORONGO ENTERTAINMENT

CONCEPTUAL SITE PLAN ALT. 4
EXHIBIT DATE: OCTOBER 16, 2012

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Exhibit 1
Site Plan

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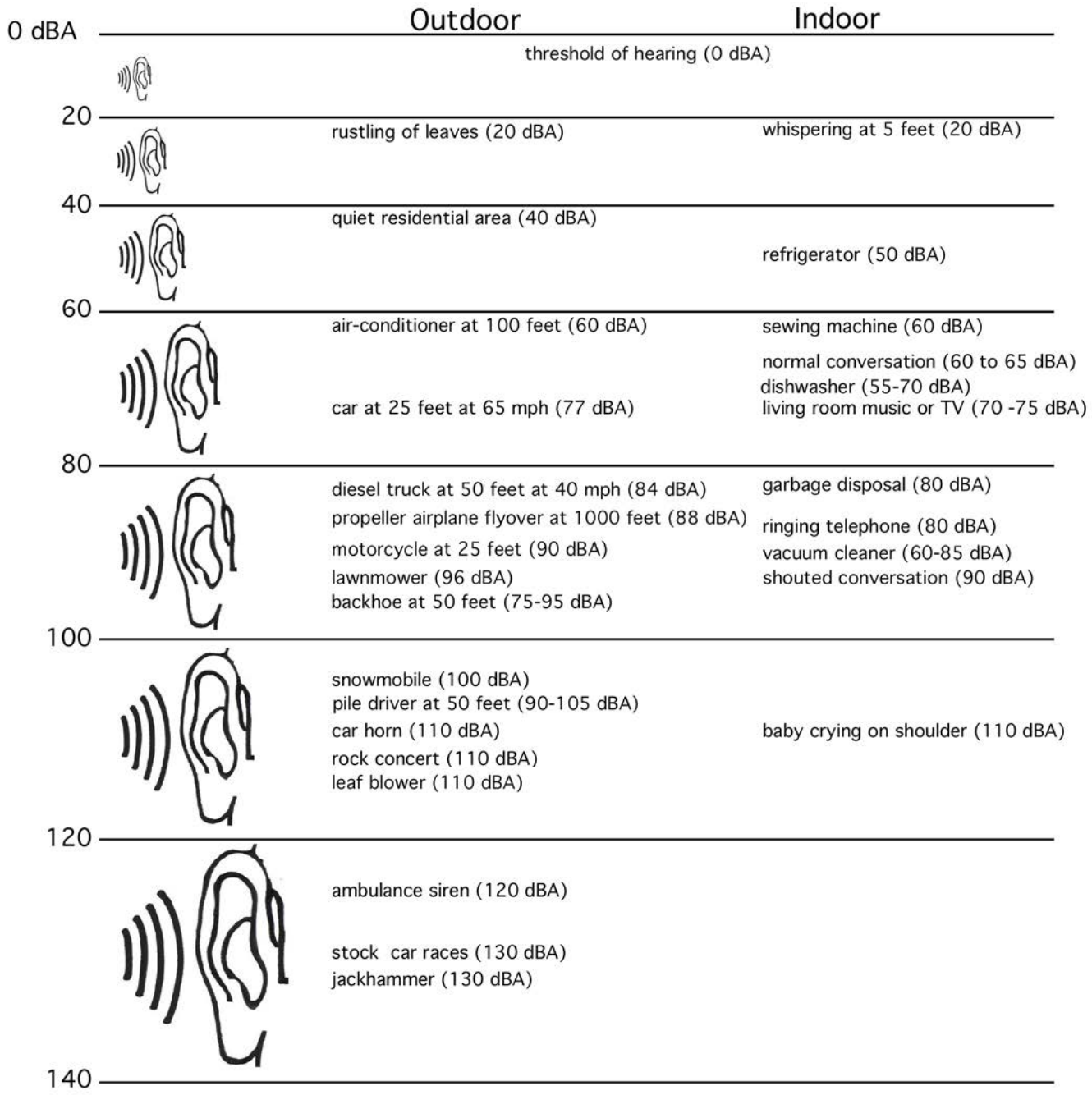
Since the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale (dBA) performs this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear. Community noise levels are measured in terms of the "A-weighted decibel," abbreviated dBA. Exhibit 2 provides examples of various noises and their typical A-weighted noise level.

Sound levels decrease as a function of distance from the source as a result of wave divergence, atmospheric absorption and ground attenuation. As the sound wave form travels away from the source, the sound energy is dispersed over a greater area, thereby dispersing the sound power of the wave. Atmospheric absorption also influences the levels that are received by the observer. The greater the distance traveled, the greater the influence and the resultant fluctuations. The degree of absorption is a function of the frequency of the sound as well as the humidity and temperature of the air. Turbulence and gradients of wind, temperature and humidity also play a significant role in determining the degree of attenuation. Intervening topography can also have a substantial effect on the effective perceived noise levels.

Noise has been defined as unwanted sound and it is known to have several adverse effects on people. From these known effects of noise, criteria have been established to help protect the public health and safety and prevent disruption of certain human activities. This criteria is based on such known impacts of noise on people as hearing loss, speech interference, sleep interference, physiological responses and annoyance. Each of these potential noise impacts on people are briefly discussed in the following narratives:

> **HEARING LOSS** is not a concern in community noise situations of this type. The potential for noise induced hearing loss is more commonly associated with occupational noise exposures in heavy industry or very noisy work environments. Noise levels in neighborhoods, even in very noisy airport environs, are not sufficiently loud to cause hearing loss.
>
> **SPEECH INTERFERENCE** is one of the primary concerns in environmental noise problems. Normal conversational speech is in the range of 60 to 65 dBA and any noise in this range or louder may interfere with speech. There are specific methods of describing speech interference as a function of distance between speaker and listener and voice level.
>
> **SLEEP INTERFERENCE** is a major noise concern for traffic noise. Sleep disturbance studies have identified interior noise levels that have the potential to cause sleep disturbance. Note that sleep disturbance does not necessarily mean awakening from sleep, but can refer to altering the pattern and stages of sleep.



Sources: League For The Hard Of Hearing, www.lhh.org
Handbook of Noise Control, McGraw Hill, Edited byCyril Harris, 1979
Measurements by Mestre Greve Associates

Exhibit 2

Typical Noise Levels

PHYSIOLOGICAL RESPONSES are those measurable effects of noise on people that are realized as changes in pulse rate, blood pressure, etc. While such effects can be induced and observed, the extent is not known to which these physiological responses cause harm or are sign of harm.

ANNOYANCE is the most difficult of all noise responses to describe. Annoyance is a very individual characteristic and can vary widely from person to person. What one person considers tolerable can be quite unbearable to another of equal hearing capability.

1.2.2 Noise Assessment Metrics

The description, analysis and reporting of community noise levels around communities is made difficult by the complexity of human response to noise and the myriad of noise metrics that have been developed for describing noise impacts. Each of these metrics attempts to quantify noise levels with respect to community response. Most of the metrics use the A-Weighted noise level to quantify noise impacts on humans. A-Weighting is a frequency weighting that accounts for human sensitivity to different frequencies.

Noise metrics can be divided into two categories: single event and cumulative. Single-event metrics describe the noise levels from an individual event such as an aircraft fly over or perhaps a heavy equipment pass-by. Cumulative metrics average the total noise over a specific time period, which is typically 1 or 24-hours for community noise problems. For this type of analysis, cumulative noise metrics will be used.

Several rating scales have been developed for measurement of community noise. These account for: (1) the parameters of noise that have been shown to contribute to the effects of noise on man, (2) the variety of noises found in the environment, (3) the variations in noise levels that occur as a person moves through the environment, and (4) the variations associated with the time of day. They are designed to account for the known health effects of noise on people described previously. Based on these effects, the observation has been made that the potential for a noise to impact people is dependent on the total acoustical energy content of the noise. A number of noise scales have been developed to account for this observation. Two of the predominate noise scales are the: Equivalent Noise Level (LEQ) and the Community Noise Equivalent Level (CNEL). These scales are described in the following paragraphs.

LEQ is the sound level corresponding to a steady-state sound level containing the same total energy as a time-varying signal over a given sample period. LEQ is the "energy" average noise level during the time period of the sample. LEQ can be measured for any time period, but is typically measured for 1 hour. This 1-hour noise level can also be referred to as the Hourly Noise Level (HNL). It is the energy sum of all the events and background noise levels that occur during that time period.

CNEL, Community Noise Equivalent Level, is the predominant rating scale now in use in California for land use compatibility assessment. The CNEL scale represents a time weighted 24-hour average noise level based on the A-weighted decibel. Time weighted refers to the fact that noise that occurs during certain sensitive time periods is penalized

for occurring at these times. The evening time period (7 p.m. to 10 p.m.) penalizes noises by 5 dBA, while nighttime (10 p.m. to 7 a.m.) noises are penalized by 10 dBA. These time periods and penalties were selected to reflect people's increased sensitivity to noise during these time periods. A CNEL noise level may be reported as a "CNEL of 60 dBA," "60 dBA CNEL," or simply "60 CNEL." Typical noise levels in terms of the CNEL scale for different types of communities are presented in Exhibit 3.

Ldn, the day-night scale is similar to the CNEL scale except that evening noises are not penalized. It is a measure of the overall noise experienced during an entire day. The time-weighted refers to the fact that noise that occurs during certain sensitive time periods is penalized for occurring at these times. In the Ldn scale, those noise levels that occur during the night (10 pm to 7 am) are penalized by 10 dB. This penalty was selected to attempt to account for increased human sensitivity to noise during the quieter period of a day, where home and sleep is the most probable activity.

L(%) is a statistical method of describing noise which accounts for variance in noise levels throughout a given measurement period. L (%) is a way of expressing the noise level exceeded for a percentage of time in a given measurement period. For example since 5 minutes is 25% of 20 minutes, L(25) is the noise level that is equal to or exceeded for five minutes in a twenty-minute measurement period. It is L(%) that is used for most Noise Ordinance standards. For example most daytime county, state and city noise ordinances use an ordinance standard of 55 dBA for 30 minutes per hour or an L(50) level of 55 dBA. In other words, the Noise Ordinance states that no noise level should exceed 55 dBA for more that fifty percent of a given period.

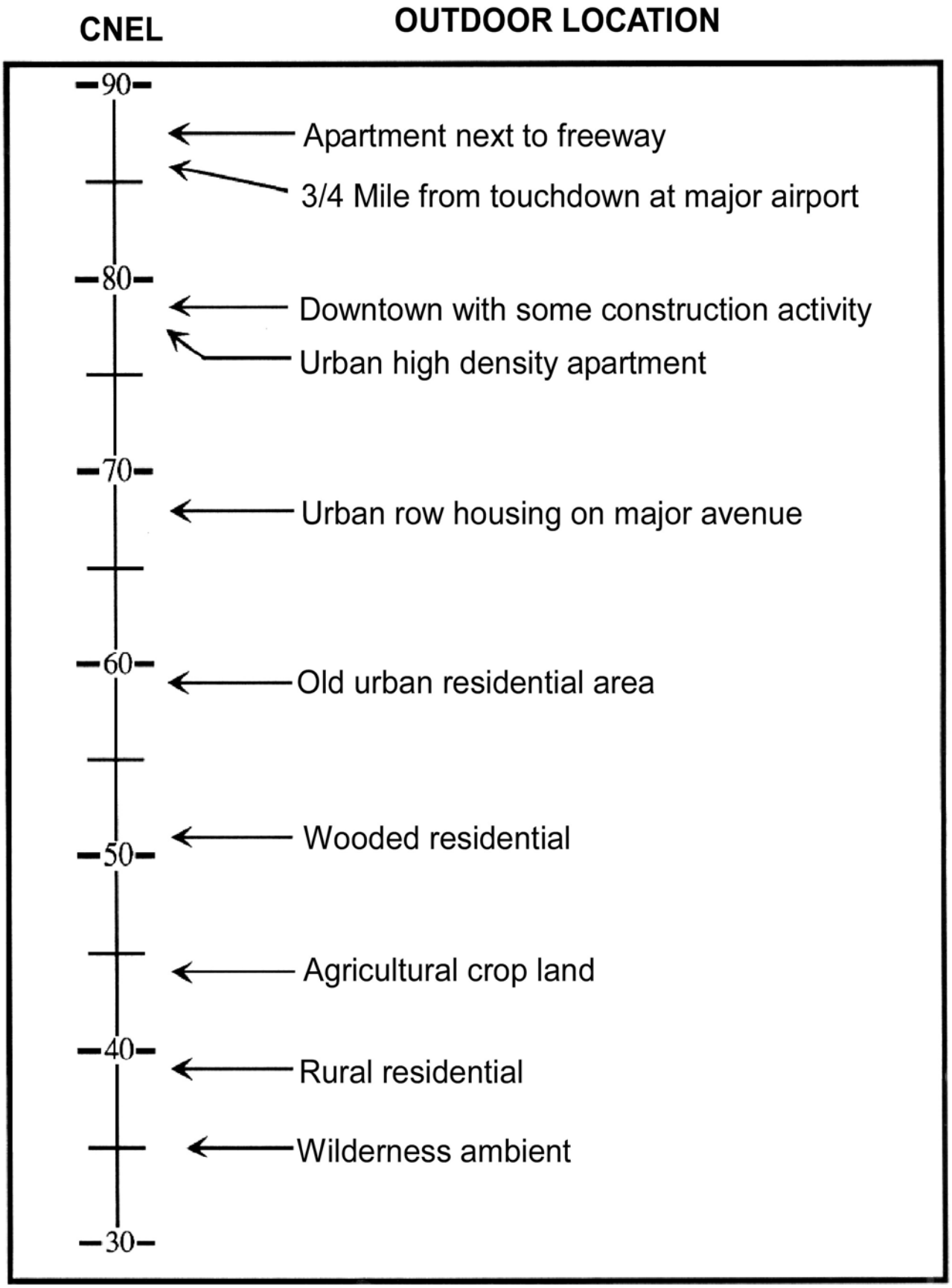


Exhibit 3

Typical CNEL Levels

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1.3 Noise Criteria

The most relevant planning documents relative to noise are the compatibility guidelines and the noise ordinance. Many jurisdictions have adopted a Noise Element of the General Plan which includes compatibility guidelines. The noise ordinance is usually part of a city's municipal code. The Morongo Tribe is not required to have either of these documents. However, compatibility guidelines and a model noise ordinance are useful in evaluating potential impacts. The State of California, Department of Health Services has developed compatibility guidelines and a model noise ordinance. They appear appropriate to use for this project to evaluate potential impacts. However, it needs to be emphasized that they have no regulatory impact in regards to this project.

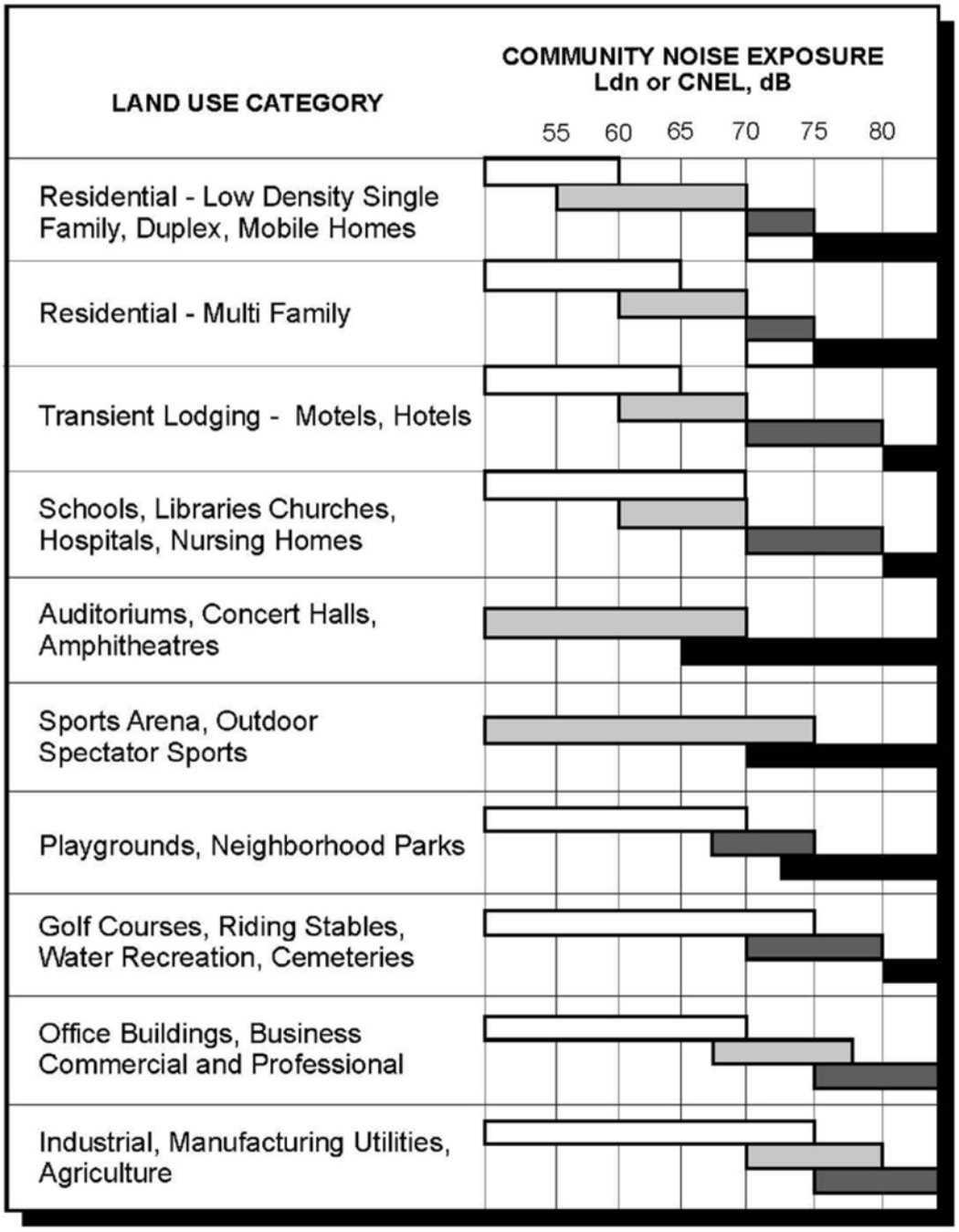
1.3.1 California Compatibility Guidelines

The State of California Compatibility Guidelines, published by the Department of Health, provide guidance for the acceptability of different land uses. The compatibility guidelines are reproduced here in Exhibit 4. The guidelines are used to evaluate the compatibility of the proposed land uses with the noise environment. The guidelines show compatibility of various land uses with different noise environments. Amphitheaters are shown as conditionally acceptable for noise levels up to 70 CNEL.

1.3.2 California Model Noise Ordinance

A noise ordinance is designed to control unnecessary, excessive and annoying sounds from stationary (non-transportation) noise sources. Noise ordinance requirements cannot be applied to mobile noise sources such as heavy trucks when traveling on public roadways. Federal and state laws preempt control of mobile noise sources on public roads. Noise ordinance standards typically apply to a noise source on one parcel of land impacting a nearby parcel of land (usually residential).

Table 1 shows the exterior noise standard for various land uses contained in the Model Noise Ordinance. The noise ordinance uses percentile noise levels. The State model noise ordinance shows a criteria of 50 dBA L50 daytime (7 a.m. to 10 p.m.) and 40 dBA L50 (1-hour) nighttime (10 p.m. to 7 a.m.) for rural residential uses. This means that a noise source cannot cause the L50 noise level to exceed 50 dBA during the daytime or 40 dBA during the nighttime for more than 30 minutes at nearby residential property lines. Other percentile criteria can apply. However, for noise sources that have a steady noise level (e.g., pump station), the L50 percentile criteria will be the most stringent. The model ordinance does recommend that the noise limits be increased to ambient noise levels if the ambient levels are higher.



NORMALLY ACCEPTABLE
Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

CONDITIONALLY ACCEPTABLE
New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

NORMALLY UNACCEPTABLE
New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise reduction features included in the design.

CLEARLY UNACCEPTABLE
New construction or development should generally not be undertaken.

Source: California Governor's Office of Planning and Research, State of California General Plan Guidelines, Appendix C.

Exhibit 4

California Compatibility Matrix

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Table 1 California Model Noise Ordinance Limits

	Noise Limit (dBA)				
	L50	**L25**	**L8.3**	**L1.7**	**Lmax**
Rural Residential					
Day (7 a.m. to 10 p.m.)	50	55	60	65	70
Night (10 p.m. to 7 a.m.)	40	45	50	55	60
Multi-Family/Hotel (Rural)					
Day (7 a.m. to 10 p.m.)	50	55	60	65	70
Night (10 p.m. to 7 a.m.)	45	50	55	60	65
Commercial					
Day (7 a.m. to 10 p.m.)	65	70	75	80	85
Night (10 p.m. to 7 a.m.)	60	65	70	75	80

The model noise ordinance recommends exempting noise from construction activity for certain time periods. Construction activities cannot take place between 7:00 p.m. and 7:00 a.m. on weekdays or at any time on weekends or holidays without being in violation of the noise ordinance. If construction does occur during these times, it must comply with the limits discussed above.

1.4 Existing Noise Measurements

The existing noise levels in the vicinity of the proposed entertainment facility are needed to establish the current baseline noise levels. A noise measurement survey of the project site and the surrounding area was conducted. The sites were selected to provide coverage of the project area. The measurement sites are displayed in Exhibit 5.

Eight sites were selected for measurement of the noise environment near the proposed Morongo Entertainment Venue. The measurement locations were selected on the basis of proximity to the potential noise sources and noise sensitivity of the land use. The measurement locations are depicted in Exhibit 5. The noise measurements were made on December 6, 2012 for fifteen minutes at each site during daytime hours, then repeated during the evening hours, at a normal receptor height of about 5 feet above the ground. The results of the noise measurements are presented below in Table 2.

Exhibit 5

Noise Measurement Sites

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Table 2 Ambient Noise Measurement Results

Site	Leq	Lmax	L1.7	L8.3	L25	L50	L90	Lmin
Daytime								
1	59.0	71.1	64.5	62.0	58.5	57.0	56.0	54.8
2	65.0	72.4	67.5	66.5	65.5	64.5	63.0	60.5
3	57.3	70.0	62.0	58.0	57.0	56.0	55.0	54.0
4	52.3	66.8	61.5	52.5	51.0	50.0	49.0	47.0
5	58.7	75.8	65.5	60.0	57.0	55.5	54.0	51.6
6	60.0	76.3	72.5	58.0	51.0	49.0	46.5	45.2
7	62.5	68.9	66.5	65.5	63.5	62.0	57.5	55.4
8	64.8	83.5	75.5	64.5	60.0	57.5	53.0	50.0
Evening								
1	56.7	63.0	60.0	59.0	57.5	56.0	54.0	52.8
2	66.2	72.0	70.0	69.0	67.0	65.0	63.5	62.1
3	56.2	70.3	58.0	57.5	56.5	55.5	54.0	52.5
4	48.2	51.9	50.5	49.5	48.5	48.0	46.5	44.8
5	55.7	61.0	59.5	58.0	56.0	55.0	53.0	51.5
6	47.4	62.5	54.5	49.0	47.0	45.5	43.5	42.6
7	65.3	71.1	69.5	68.0	66.0	64.5	60.5	57.2
8	64.7	82.3	76.0	68.5	59.5	55.5	52.5	47.0

The measurements were made with a Brüel & Kjær Type 2238 Sound Level Meter, which was calibrated before and after the measurements. This noise measurement system meets the American National Standards Institute "Type 1" specifications, which is the most accurate type of sound level meter available for community noise measurements. The meter and calibrator have current certification traceable to the National Institute of Standards and Technology (NIST).

1.4.1 Detailed Discussion of Noise Measurements

Eight sites were monitored as part of the measurement program. Each site is discussed below.

Site 1 - This site is located in the Casino Morongo parking lot just north of the main casino building. The sound level meter was located near the center of the parking lot. The daytime measurements were taken around 2:30 pm, and the evening measurements were performed around 8:40 pm. During the daytime measurements, the average sound level (Leq) was 59.0

dBA. The levels fluctuated between 54.8 dBA and 71.1 dBA. The maximum was caused by a bus in the parking lot passing near the microphone. During the evening measurements, the average sound level (Leq) was 56.7 dBA. The levels fluctuated between 52.8 dBA and 63.0 dBA. The maximum was caused by a car passing near the microphone.

Site 2 - This site is located west of Casino Morongo. The sound level meter was located on the east side of Apache Trail, at the point where the roadway intersects with Mojave Drive. The daytime measurements were taken around 3:35 pm, and the evening measurements were performed around 8:20 pm. During the daytime measurements, the average sound level (Leq) was 65.0 dBA. The levels fluctuated between 60.5 dBA and 72.4 dBA. The maximum was caused by a car passing near the microphone. During the evening measurements, the average sound level (Leq) was 66.2 dBA. The levels fluctuated between 62.1 dBA and 72.0 dBA. The maximum was caused by a car passing near the microphone.

Site 3 – Site 3 is located west of Casino Morongo. The sound level meter was located on the east side of Millard Pass, in the vacant lot at the northeast corner of Millard Pass and Apache Trail. The daytime measurements were taken around 6:05 pm, and the evening measurements were performed around 8:00 pm. During the daytime measurements, the average sound level (Leq) was 57.3 dBA. The levels fluctuated between 54.0 dBA and 70.0 dBA. The maximum was caused by a car passing near the microphone. During the evening measurements, the average sound level (Leq) was 56.2 dBA. The levels fluctuated between 52.5 dBA and 70.3 dBA. The maximum was caused by a car passing near the microphone.

Site 4 - This site is at the Morongo Tribal Administration facility. The sound level meter was located on the east side of Pumarra Road, approximately even with the south edge of the round building at the facility. The daytime measurements were taken around 2:30 pm, and the evening measurements were performed around 7:20 pm. During the daytime measurements, the average sound level (Leq) was 52.3 dBA. The levels fluctuated between 47.0 dBA and 66.8 dBA. The maximum was caused by a car passing near the microphone. During the evening measurements, the average sound level (Leq) was 48.2 dBA. The levels fluctuated between 44.8 dBA and 51.9 dBA. The maximum was caused by a distant train horn south of the site.

Site 5 - This site is southwest of the Morongo Tribal Administration facility. The sound level meter was located on the north side of Martin Road, near the residence at 48960 Martin Road. The daytime measurements were taken around 2:50 pm, and the evening measurements were performed around 7:40 pm. During the daytime measurements, the average sound level (Leq) was 58.7 dBA. The levels fluctuated between 51.6 dBA and 75.8 dBA. The maximum was caused by a car passing near the microphone. During the evening measurements, the average sound level (Leq) was 55.7 dBA. The levels fluctuated between 51.5 dBA and 61.0 dBA. The maximum was caused by a car a short distance from the measurement site.

Site 6 - This site is northwest of the Morongo Tribal Administration facility, and is the farthest measured site from the planned entertainment venue. The sound level meter was located on the south side of Sullivan Road, adjacent to the easternmost residence. The daytime measurements were taken around 2:10 pm, and the evening measurements were performed around 7:00 pm. During the daytime measurements, the average sound level (Leq) was 60.0 dBA. The levels

fluctuated between 45.2 dBA and 76.3 dBA. The maximum was caused by a car passing near the microphone. During the evening measurements, the average sound level (Leq) was 47.4 dBA. The levels fluctuated between 42.6 dBA and 62.5 dBA. The maximum was caused by a motorcycle near the measurement site.

Site 7 - This site is located east of Casino Morongo, across Interstate 10. The sound level meter was located at the west end of Ramona Street. The daytime measurements were taken around 12:35 pm, and the evening measurements were performed around 9:00 pm. During the daytime measurements, the average sound level (Leq) was 62.5 dBA. The levels fluctuated between 55.4 dBA and 68.9 dBA. The maximum was caused by a car passing near the microphone. During the evening measurements, the average sound level (Leq) was 65.3 dBA. The levels fluctuated between 57.2 dBA and 71.1 dBA. The maximum was caused by a truck on Interstate 10.

Site 8 - This site is also located east of Casino Morongo, across Interstate 10 and just south of Site 7. The sound level meter was located on the north side of Bonita Avenue, near the point where Pecan Street will intersect the roadway. The daytime measurements were taken around 3:10 pm, and the evening measurements were performed around 9:20 pm. During the daytime measurements, the average sound level (Leq) was 64.8 dBA. The levels fluctuated between 50.0 dBA and 83.5 dBA. The maximum was caused by a truck on Interstate 10. During the evening measurements, the average sound level (Leq) was 64.7 dBA. The levels fluctuated between 47.0 dBA and 82.3 dBA. The maximum was caused by a truck on Interstate 10.

1.5 Existing Roadway Noise Levels

The highway noise levels projected in this report were computed using the Highway Noise Model published by the Federal Highway Administration ("FHWA Highway Traffic Noise Prediction Model," FHWA-RD-77-108, December, 1978). The FHWA Model uses traffic volume, vehicle mix, vehicle speed, and roadway geometry to compute the "equivalent noise level." A computer code has been written which computes equivalent noise levels for each of the time periods used in the calculation of CNEL. Weighting these noise levels and summing them results in the CNEL for the traffic projections used. CNEL contours are found by iterating over many distances until the distances to the 60, 65, 70, and 75 CNEL contours are found.

Specifically traffic noise increases due to the project are examined. Traffic data utilized was provided by the traffic consultant for the project (Crain & Associates, November 9, 2012). Traffic volumes and estimated speeds were used with the FHWA Model to estimate the noise levels in terms of CNEL. The distances to the CNEL contours for the roadways in the vicinity of the project site are given in Table 3. These numbers represent the distance from the centerline of the road to the contour value shown. Note that the values given in Table 3 do not take into account the effect of any noise barriers or topography that may affect ambient noise levels.

Table 3 Existing Roadway Traffic Noise Levels

Roadway Segment		CNEL @ 100' †	Distance To CNEL Contour from Centerline of Roadway (feet) 70 CNEL	65 CNEL	60 CNEL
Seminole Drive	Malki Road to Millard Pass	61.4	26	57	124
Seminole Drive	Millard Pass to Morongo Trail	59.1	RW	40	86
Seminole Drive	Morongo Trail to Morongo Road	59.1	RW	40	86
Seminole Drive	Morongo Road to E. Project Driveway	60.4	22	49	105
Seminole Drive	E. Project Driveway to Main Street	54.9	RW	21	45
Main Street	Apache Trail to Broadway	54.2	RW	RW	40
Main Street	Broadway to E/B I-10 Ramps	56.0	RW	25	53
Main Street	E/B I-10 Ramps to Seminole Drive	55.0	RW	21	46
Morongo Trail/Agave Road	Seminole Drive to Casino Driveway	0	RW	RW	RW
Apache Trail	South of Main Street	54.8	RW	20	45
Morongo Road	Seminole Drive to Casino Driveway	60.4	RW	39	85
Morongo Road	North of Agave Road	0	RW	RW	RW
East Project Driveway	North of Seminole Drive	0	RW	RW	RW
Broadway	South of Main Street	56.9	RW	28	61
I-10 Freeway	In Project Vicinity	78.9	392	844	1819

† From roadway centerline
RW – Noise contour falls within roadway right-of-way.

Table 3 shows that substantial traffic noise occurs along the I-10 Freeway. The other roadways in the area contribute little to the general noise levels in the area.

2.0 POTENTIAL NOISE IMPACTS

Potential noise impacts are commonly divided into two groups; temporary and long term. Temporary impacts are usually associated with noise generated by construction activities. Long-term impacts are further divided into impacts on surrounding land uses generated by the proposed project and those impacts that occur at the proposed project site.

2.1 Noise Impact Criteria

Off-site impacts from on-site activities, short-term and long-term, are measured against the Noise Ordinance criteria discussed in Section 1.3. Construction activities for the proposed project should meet the California Model Noise Ordinance guidelines to avoid impacts due to construction. Similarly, the amphitheater activities should also be consistent with the Model Ordinance guidelines to avoid potential impacts.

Long-term off-site impacts from traffic noise are measured against two criteria. Both criteria must be met for a significant impact to be identified. First, project traffic must cause a substantial noise level increase (greater than 3 dB) on a roadway segment adjacent to a noise sensitive land use. Second the future noise level that will exist if the project is completed must exceed the criteria level for the noise sensitive land use. In this case, the criteria level is 65 CNEL for residential land uses, schools, and other sensitive land uses. The project will have a significant impact if it causes a 3 dB increase and the resulting noise level is 65 CNEL or higher for sensitive land uses. In community noise assessment, changes in noise levels greater than 3 dB are often identified as significant, while changes less than 1 dB will not be discernible to local residents. In the range of 1 to 3 dB, residents who are very sensitive to noise may perceive a slight change. Note that there is no scientific evidence is available to support the use of 3 dB as the significance threshold. In laboratory testing situations, humans are able to detect noise level changes of slightly less than 1 dB. In a community noise situation, however, noise exposures are over a long time period, and changes in noise levels occur over years, rather than the immediate comparison made in a laboratory situation. Therefore, the level at which changes in community noise levels become discernible is likely to be some value greater than 1 dB, and 3 dB appears to be appropriate for most people.

2.2 Temporary Impacts

2.2.1 Construction Noise

Construction noise represents a short-term impact on ambient noise levels. Noise generated by construction equipment, including trucks, graders, bulldozers, concrete mixers and portable generators can reach high levels.

Worst-case examples of construction noise at 50 feet are presented in Exhibit 6. Typical equipment that might be employed for this type of project includes graders, scrapers, front loaders, trucks, concrete mixers and concrete pumps. The peak noise level for most of the equipment that will be used during the construction is 70 to 95 dBA at a distance of 50 feet. Noise levels at further distances would be less than this. For example, at 200 feet, the peak

construction noise levels range from 58 to 83 dBA. The noise levels shown in Exhibit 6 are based upon worst-case (i.e. loudest noise) conditions at the construction site, so these noise levels will be used as the basis for predicting the worst-case construction noise estimate.

The nearest sensitive land use is the existing residential land uses which are over 2,500 feet west of the project. Based on a distance of 2,500 feet, the worst-case unmitigated peak (Lmax) construction noise levels could be 36 to 61 dBA at the nearest homes. The average noise levels (L50) are typically 15 dB lower than the peak noise levels. Average noise levels (L50) at the nearest existing residential buildings could be in the range of 21 to 46 dBA (L50). These are very low levels of noise and should not be a problem for the existing residences.

Although the noise levels associated with construction will be low at existing residences, the limits on hours contained in the Model Noise Ordinance should be considered. The Model Noise Ordinance recommends limiting construction activity to certain time periods. Construction activities cannot take place between 7:00 p.m. and 7:00 a.m. on weekdays or at any time on weekends or holidays without being in violation of the noise ordinance. As long as the project does not construct within these hours it will be consistent with the Model Noise Ordinance and no noise impacts would be anticipated. (Mitigation is presented in Section 3.1.1.)

2.3 Long-Term Off-Site Impacts

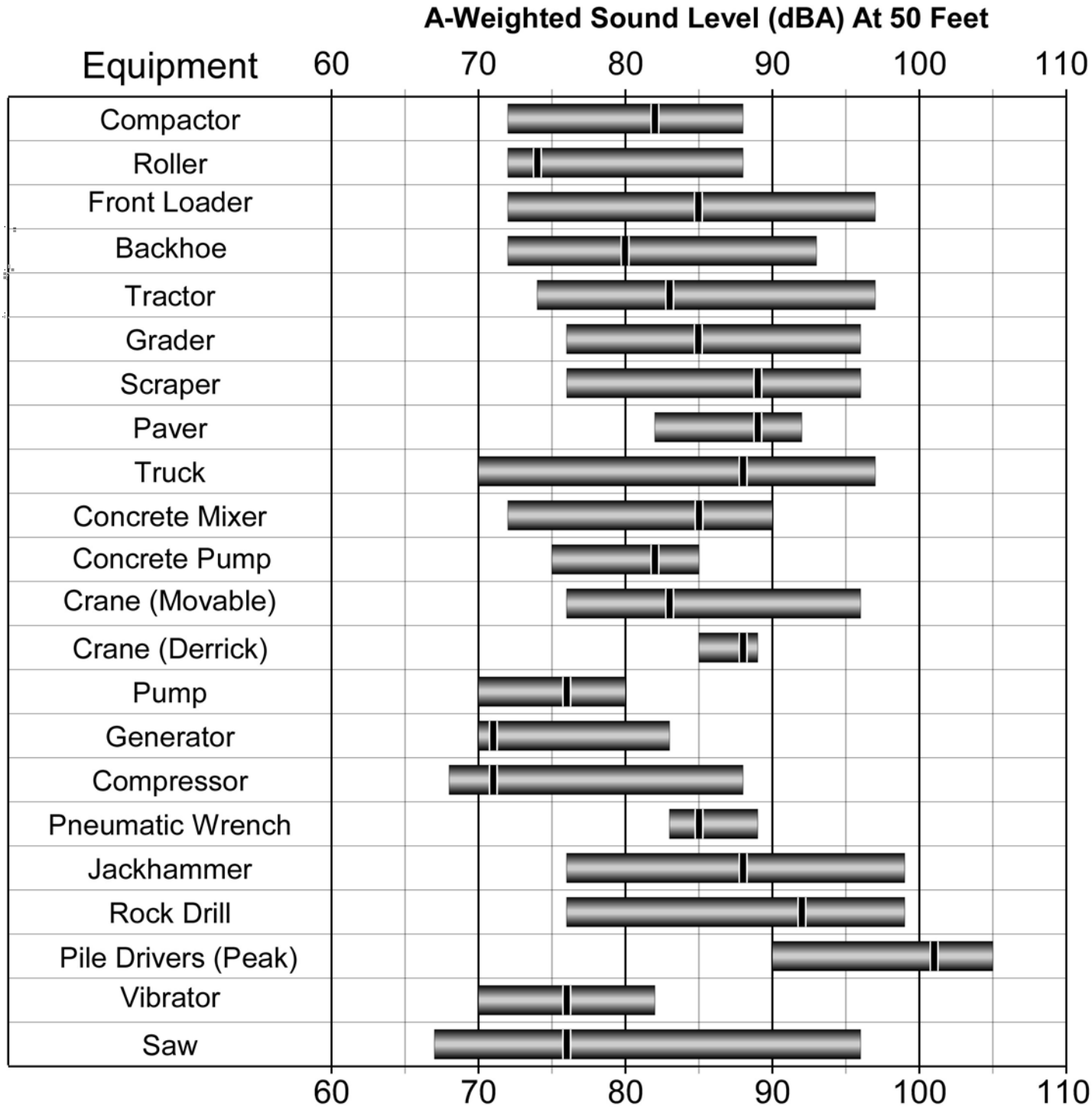
Off-site impacts may be generated due to increases in traffic noise, parking/camping activities, and concert noise. All of these sources of potential noise are assessed in the following sections.

2.3.1 Traffic Noise

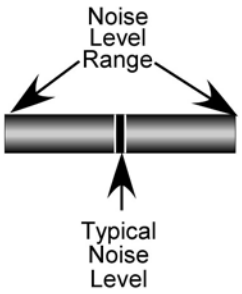
Increased traffic caused by the project will result in increased traffic noise levels along the roadways in the vicinity of the project. This section examines noise impacts from the proposed project on the surrounding land uses. Specifically traffic noise increases due to the project are examined. Traffic data utilized was provided by the traffic consultant for the project (Crain & Associates, November 9, 2012).

To determine traffic noise impacts as a result of the project, the FHWA (Federal Highway Administration) noise model was used. The FHWA noise model utilizes various traffic-flow parameters (e.g. traffic volume, speed, mix, etc.) to predict noise levels that result from the operation of motor vehicles on the roadways. Traffic volumes for arterials utilized were provided in the traffic study for the project referenced previously.

Table 4 shows traffic noise CNEL level changes on the roadways affected by the project. The first data column of Table 4 shows the project's contribution to the increase for a one-day concert. The second data column shows the noise increase anticipated for a larger festival type event. In some cases the noise increase is identified as greater than 20 dB (>20). These are roadways where the existing traffic volume is not known, but it is very low. Since the existing traffic is not known, the increase is simply identified as greater than 20 dB.



LEGEND



Sources: "Handbook of Noise Control,"
by Cyril Harris, 1979
" Transit Noise and Vibration Impact Assessment"
by Federal Transit Administration, 1995

Exhibit 6

Construction Noise Levels

Mestre Greve Associates
Division of Landrum & Brown

Table 4 Traffic Noise CNEL Increases (dB)

Roadway Segment		Concert Impact	Festival Impact
Seminole Drive	Malki Road to Millard Pass	**3.5**	**4.7**
Seminole Drive	Millard Pass to Morongo Trail	**3.3**	**4.8**
Seminole Drive	Morongo Trail to Morongo Road	-3.0	-2.2
Seminole Drive	Morongo Road to E. Project Driveway	-1.9	-1.2
Seminole Drive	E. Project Driveway to Main Street	**5.6**	**8.1**
Main Street	Apache Trail to Broadway	0.6	1.8
Main Street	Broadway to E/B I-10 Ramps	0.4	1.5
Main Street	E/B I-10 Ramps to Seminole Drive	**4.1**	**5.9**
Morongo Trail/Agave Road	Seminole Drive to Casino Driveway	**>20**	**>20**
Apache Trail	South of Main Street	0.8	2.0
Morongo Road	Seminole Drive to Casino Driveway	1.1	**3.3**
Morongo Road	North of Agave Road	**>20**	**>20**
East Project Driveway	North of Seminole Drive	**>20**	**>20**
Broadway	South of Main Street	0.3	1.3
I-10 Freeway	In Vicinity of Project	0.0	0.0

Eight of the roadway links indicate that there would be traffic noise increases greater than 3 dB for festivals, and seven for concerts. Six of the eight roadway links do not have residences or other sensitive receptors near the roadways. These roadways include Seminole Drive between Malki Road and Millard Pass and between Millard Pass to Morongo Trail, Seminole Drive between the East Project Driveway and Main Street, Morongo Trail from Seminole Drive to the Casino Driveway, Main Street between Broadway and the I-10 ramps, and the East Project Driveway north of Seminole Drive. The remaining two roadway links do have residences in their vicinity. These roadways include Morongo Road between Seminole Drive and Casino Driveway, and Morongo Road north of Agave Road. These two roadway links are discussed more in the following paragraphs, and specifically, whether the noise increases result in noise levels exceeding 65 CNEL.

The distances to the CNEL contours with future project traffic for the roadways in the vicinity of the proposed project site are presented in Table 5 for the concert events and Table 6 for the festival events. The values shown under the 60, 65 and 70 CNEL columns represent the distance from the centerline of the roadway to the respective contour value. The CNEL at 100 feet from the roadway centerline is also presented. Traffic volumes, speeds and traffic mixes used to calculate the noise levels are presented in the appendix.

Table 5 Traffic Noise Levels With A Concert Event

Roadway Segment		CNEL @ 100' †	Distance To CNEL Contour from Centerline of Roadway (feet) 70 CNEL	65 CNEL	60 CNEL
Seminole Drive	Malki Road to Millard Pass	65.0	46	99	213
Seminole Drive	Millard Pass to Morongo Trail	62.4	31	67	144
Seminole Drive	Morongo Trail to Morongo Road	56.1	RW	25	54
Seminole Drive	Morongo Road to E. Project Driveway	58.4	RW	36	78
Seminole Drive	E. Project Driveway to Main Street	60.5	23	50	108
Main Street	Apache Trail to Broadway	54.8	RW	20	44
Main Street	Broadway to E/B I-10 Ramps	56.4	RW	26	57
Main Street	E/B I-10 Ramps to Seminole Drive	59.1	RW	40	87
Morongo Trail/Agave Road	Seminole Drive to Casino Driveway	59.8	21	45	97
Apache Trail	South of Main Street	55.6	RW	23	50
Morongo Road*	Seminole Drive to Casino Driveway	60.0	21	46	100
Morongo Road*	North of Agave Road	59.0	RW	39	85
East Project Driveway	North of Seminole Drive	57.7	RW	32	70
Broadway	South of Main Street	57.2	RW	30	65
I-10 Freeway	In Project Vicinity	78.9	392	844	1819

† From roadway centerline
RW – Noise contour falls within roadway right-of-way
* Traffic link identified with an increase greater than 3 dB and residences in vicinity

Table 6 Traffic Noise Levels With A Festival Event

Roadway Segment		CNEL @ 100' †	Distance To CNEL Contour from Centerline of Roadway (feet) 70 CNEL	65 CNEL	60 CNEL
Seminole Drive	Malki Road to Millard Pass	66.1	55	118	255
Seminole Drive	Millard Pass to Morongo Trail	63.8	38	83	180
Seminole Drive	Morongo Trail to Morongo Road	56.9	RW	28	61
Seminole Drive	Morongo Road to E. Project Driveway	59.2	RW	41	88
Seminole Drive	E. Project Driveway to Main Street	62.9	33	72	156
Main Street	Apache Trail to Broadway	56.0	RW	24	53
Main Street	Broadway to E/B I-10 Ramps	57.4	RW	31	67
Main Street	E/B I-10 Ramps to Seminole Drive	60.9	24	53	115
Morongo Trail/Agave Road	Seminole Drive to Casino Driveway	61.5	26	58	125
Apache Trail	South of Main Street	56.8	RW	28	61
Morongo Road*	Seminole Drive to Casino Driveway	62.3	30	65	141
Morongo Road*	North of Agave Road	62.2	30	65	140
East Project Driveway	North of Seminole Drive	60.6	23	50	109
Broadway	South of Main Street	58.2	RW	35	75
I-10 Freeway	In Project Vicinity	78.9	392	844	1819

† From roadway centerline
RW – Noise contour falls within roadway right-of-way
* Traffic link identified with an increase greater than 3 dB and residences in vicinity

The two roadway links that have increases greater than 3 dB and have residences are Morongo Road (Seminole Drive to Casino Driveway) and Morongo Road (north of Agave Road). The resulting noise levels with a festival event will be low (i.e., less than 65 CNEL), and no impacts will result.

2.3.2 Parking Lot/Camping Noise

Two large areas are identified on the site plan. One area would be for general parking, and the other area would allow for camping and recreational vehicle (RV) parking during festival events. The proposed parking and camping areas will be a source of noise. Sensitive land uses in the vicinity include residential uses to the west at approximately 3,000 feet (see for example Measurement Sites 2, 3, 4, and 5 in Exhibit 5).

Traffic associated with parking lots is not usually of sufficient volume to exceed community noise standards that are based on a time averaged scale such as the CNEL scale. However, the instantaneous maximum sound levels generated by car door slamming, engine start-up, alarm activation and car passbys can still be annoying to nearby residents. For camping/RV areas there

are the additional potential sources of noise such as informal singing and RV generators. Estimates of the noise levels associated with these activities are presented in Table 7. These levels are based on measurements conducted by Mestre Greve Associates. The noise levels presented are for a distance of 50 feet from the source. Many of the events are short term in nature and therefore the maximum noise level (Lmax) generated is of most concern. Other events may last for an extended period of time and the average noise level (L50) is the critical parameter. A range of noise level is given to reflect the variability of noise generated by the various activities.

Table 7 Parking Lots and Camping Noise

Event	Noise Level @ 50 Feet (dBA)
Door Slam	60 to 70 (Lmax)
Car Alarm Activation	65 to 70 (Lmax)
Engine Start-up	60 to 70 (Lmax)
Car pass-by	55 to 70 (Lmax)
Camp Sing-A-Longs	70 to 80 (L50)
RV Generators	65 to 75 (L50)

The nearest residences west of project are roughly 3,000 feet from the proposed parking areas. Table 8 presents the noise levels for the various activities at a distance of 3,000 feet. These noise levels represent a worst case noise level in that no adjustments have been made for intervening topography, the fact that most parking lot events would occur much further away, and that the vast majority of events would be shielded from the residents by other vehicles. Also in Table 8 are the ambient noise levels measured at Site 3, which is one of the quieter sites, for comparison purposes. The projected noise levels from the parking lot and camping activities are all well below the ambient nighttime noise levels, and therefore, no noise impacts are anticipated. Also for comparison are the nighttime limits in the California Model Noise Ordinance. However, the model ordinance suggests that the limits should be increased to ambient conditions when the ambient levels are higher than the ordinance suggested values.

Table 8 Parking Lot and Camping Noise at Residences

Event	Noise Level @ 3,000 Feet (dBA)	Nighttime Ambient	Model Ordinance
Door Slam	24 to 34 (Lmax)	61	60
Car Alarm Activation	29 to 34 (Lmax)	61	60
Engine Start-up	24 to 34 (Lmax)	61	60
Car pass-by	19 to 34 (Lmax)	61	60
Camp Sing-A-Longs	34 to 44 (L50)	55	40
RV Generators	29 to 39 (L50)	55	40

2.3.3 Concert Noise

The site plan (Exhibit 1) shows several areas of activity that could generate noise. These areas include the amphitheater, festival grounds, and retail concourse. The loudest of these areas would be the amphitheater. The amphitheater would accommodate the loudest bands and the largest crowds. Therefore, this analysis focuses on the potential for amphitheater noise impacts to the surrounding community.

Mestre Greve Associates conducted a series of noise measurements around the Verizon Wireless Amphitheater Irvine in 2003. Noise measurements were conducted at multiple locations for various concerts. The concerts included Counting Crows, Iron Maiden, and Pacific Symphony. The loudest event was the Iron Maiden event, and the noise levels gathered from that event are used for the projections presented in this report. The noise levels for an amphitheater event are projected for the eight sites where ambient measurements were taken. The noise levels were projected based on the measurements made at the Iron Maiden concert and were adjusted for distance, topography, and atmospheric attenuation. A standard drop-off rate of 6 dB per doubling of the distance was used. A reduction of 2 dB per 1,000 feet was used for atmospheric attenuation. There is a slight ridge between the proposed amphitheater and receptors at sites to the west. Elevations were taken off of topographic maps for the area and the potential noise barrier effect of the ridge was calculated. A spreadsheet showing the calculations is included in the appendix.

Table 9 presents the projected amphitheater noise levels for the eight sites. The amphitheater noise levels are presented for the most critical noise scale (i.e., L50). The daytime and nighttime ambient noise levels that were measured are also presented along with the limits contained in the California Model Noise Ordinance.

Table 9 Amphitheater Noise (L50 dBA)

Site	Amphitheater Noise	Daytime Ambient	Nighttime Ambient	Daytime Ordinance	Nighttime Ordinance
1	46	57.0	56.0	65	60
2	37	64.5	65.0	50	40
3	33	56.0	55.5	50	40
4	25	50.0	48.0	50	40
5	29	55.5	55.0	50	40
6	19	49.0	45.5	50	40
7	53	62.0	64.5	50	40
8	48	57.5	55.5	50	40

The projected noise levels ranged from 19 to 53 dBA. At the residential sites to the west (i.e., Sites 2 through 6 the noise levels ranged from 19 to 37 dBA. These are very low noise levels and are well below both the ambient noise levels and the suggested criteria in the model noise ordinance. Site 1 is the parking lot for the existing Morongo Casino Resort and Spa. The noise levels from the amphitheater are projected to be well below the ambient conditions at a projected level of 46 dBA. This level will not interfere with the casino's operations. Sites 7 and 8 are on the south side of the freeway and are also residential area. There is no ridge between these sites and the amphitheater and so no topographic shielding benefits these two sites. The projected noise levels are 53 and 48 dBA for Sites 7 and 8, respectively. However, both of these sites experience significant freeway noise and the projected noise levels are well below ambient conditions. In summary, the amphitheater noise levels are well below ambient conditions for all areas around the project and therefore, no impacts are anticipated from the amphitheater concerts or other events planned for the entertainment center.

2.4 Long-Term On-Site Impacts

The purpose of this section is to examine the noise impacts on the proposed project. The primary source of noise impacting the project site would be traffic on the I-10 Freeway. The local roadways do little to affect the overall noise levels on-site. The distances to the future 60, 65 and 70 CNEL contours for the roadways adjacent to the proposed project site were presented previously in Table 6. The edge of the entertainment center (not including the parking area) is about 59 CNEL. According to the compatibility matrix (presented previously in Exhibit 4) amphitheaters are "conditionally acceptable" in noise environments from 50 to 70 CNEL. The amphitheater should be designed to insure that freeway does not intrude excessively into the amphitheater. But this is a design issue for the developers and does not constitute a significant noise impact.

3.0 MITIGATION MEASURES

3.1 Temporary Impacts

3.1.1 Construction Noise

The analysis presented in Section 2.2.1 shows that noise levels associated with construction activities would likely be adequate. To provide an additional layer of protection, the following mitigation measure could be employed.

> **Mitigation Measure N-1:**
> Control of Construction Hours – All construction activities shall be limited to the allowable hours of 7:00 a.m. and 7:00 p.m. during weekdays only. No construction should be allowed during federal or tribal holidays.

3.2 Long Term Off-Site Impacts

3.2.1 Traffic Noise

The analysis presented in Section 2.3.1 shows that the project will not result in a significant traffic noise impact, and therefore, no mitigation is necessary.

3.2.2 On-Site Activities

The analysis presented in Sections 2.3.2 and 2.3.3 shows that parking/camping lot and concert noise will not generate significant noise impacts at the nearest residences. Therefore, no mitigation measures will be needed for these activities.

4.0 UNAVOIDABLE SIGNIFICANT IMPACTS

The mitigation measures described above will mitigate all significant impacts to a level of insignificance. The project will not result in an unavoidable significant impact.

APPENDIX

Morongo Entertainment Facility						
			A	**B**	**C**	
Link #	**Roadway**		**Existing ADT**	**Friday Concert**	**Weekend Festival**	**Speed**
1	Seminole Drive	Malki Road to Millard Pass	11,655	26,261	34,270	40
2	Seminole Drive	Millard Pass to Morongo Trail	6,796	14,606	20,321	40
3	Seminole Drive	Morongo Trail to Morongo Road	6,796	3,398	4,067	40
4	Seminole Drive	Morongo Road to E. Project Driveway	9,151	5,862	7,016	40
5	Seminole Drive	E. Project Driveway to Main Street	2,573	9,435	16,444	40
6	Main Street	Apache Trail to Broadway	2,197	2,528	3,305	40
7	Main Street	Broadway to E/B I-10 Ramps	3,319	3,650	4,648	40
8	Main Street	E/B I-10 Ramps to Seminole Drive	2,674	6,890	10,374	40
9	Morongo Trail/Agave Road	Seminole Drive to Casino Driveway	0	11,208	16,254	40
10	Apache Trail	South of Main Street	2,540	3,036	4,053	40
11	Morongo Road	Seminole Drive to Casino Driveway	9,132	11,676	19,555	40
12	Morongo Road	North of Agave Road	0	9,176	19,404	40
13	East Project Driveway	North of Seminole Drive	0	6,862	13,365	40
14	Broadway	South of Main Street	4,067	4,398	5,543	40

BARRIER PREDICTION WORKSHEET, POINT SOURCE

Iron Maiden Type Noise Levels
Morongo Amphitheater
Existing Topography/Measurement Sites

Noise Level of	*74.0*	**dBA at**	*730.0*	**feet**	**(less air)**

Critical Freq. (Hz)	*500*

Noise Level at 50'	97.3

To get other noise levels, Put in Distances

Dist.	dBA
500	77.3
1000	71.3
2000	65.2
3000	61.7

To get other distances, Put in other noise levels.

dBA	Dist.
65	2,057
60	3,659
55	6,506
50	11,570

Site	Source Elevation	Distance To Wall	Base Of Wall	Dist. To Observer	Pad Elevation	Observer Height	Wall Height	*Barrier Effect*	Air @ 2dB Per 1000'	Adj.	*Noise Level* (dBA)
1	*2018*	*2774*	*2016*	*3993*	*1997*	*5*	*0.0*	5.3	8.0		**46.0**
2	*2018*	*2194*	*2028*	*6239*	*1994*	*5*	*0.0*	5.8	12.5		**37.1**
3	*2018*	*5099*	*2075*	*6818*	*2048*	*5*	*0.0*	7.6	13.6		**33.4**
4	*2018*	*6447*	*2237*	*7657*	*2183*	*5*	*0.0*	13.6	15.3		**24.7**
5	*2018*	*5207*	*2133*	*7843*	*2114*	*5*	*0.0*	8.8	15.7		**28.9**
6	*2018*	*6102*	*2267*	*9000*	*2191*	*5*	*0.0*	14.8	18.0		**19.4**
7	*2018*	*1883*	*1922*	*3683*	*1843*	*5*	*0.0*	0.0	7.4		**52.6**
8	*2018*	*1839*	*1922*	*4762*	*1796*	*5*	*0.0*	0.0	9.5		**48.2**