3.16 NOISE

3.16.1 AFFECTED ENVIRONMENT

ACOUSTIC FUNDAMENTALS

Noise is often defined as unwanted sound. Sound is a mechanical form of radiant energy transmitted by pressure waves in the air. It is characterized by two parameters: amplitude (loudness) and frequency (tone).

Amplitude is the difference between ambient air pressure and the peak pressure of the sound wave. It is measured in decibels (dB) on a logarithmic scale. For example, a 10-dB sound is 10 times the pressure difference of a 1-dB sound; a 20-dB sound is 100 times the pressure difference of a 1-dB sound. Sound amplitudes from multiple sources add together in the following way: a 65-dB source of sound, when joined by another identical 65-dB source, results in sound with amplitude of 68 dB, not 130 dB (i.e., doubling the source strength increases the sound pressure by 3 dB). Amplitude is interpreted by the ear as corresponding to loudness. Laboratory measurements correlate a 10-dB increase in amplitude with a perceived doubling of loudness and establish a 3-dB change in amplitude as the minimum audible difference perceptible to the average person.

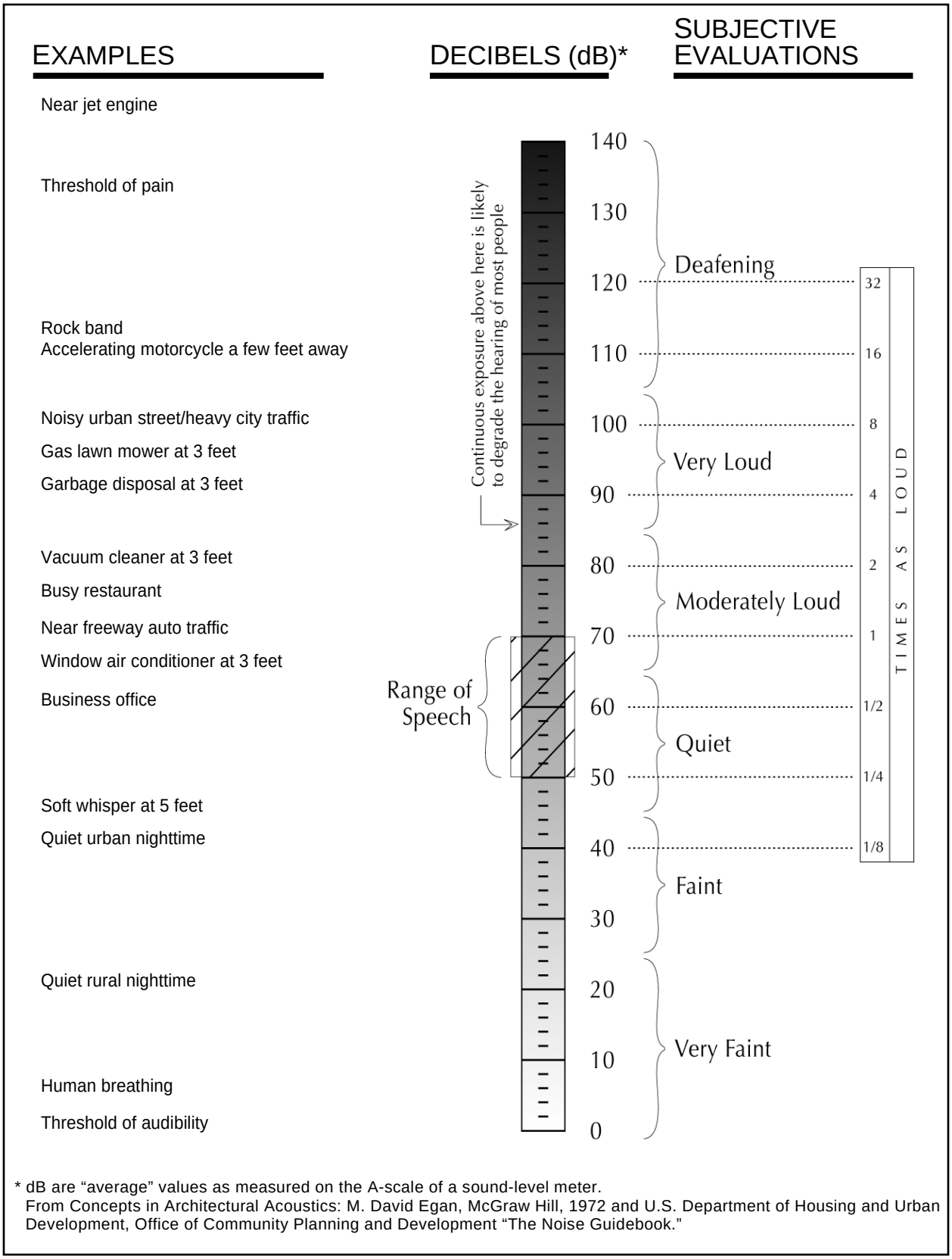
Frequency is the number of fluctuations of the pressure wave per second. The unit of frequency is the Hertz (Hz). One Hz equals one cycle per second. The human ear is not equally sensitive to sounds of different frequencies. Sound waves below 16 Hz or above 20,000 Hz cannot be heard at all, and the ear is more sensitive to sound in the higher portion of the audible range than in the lower. To approximate human sensitivity to sound, environmental sound is usually measured in A-weighted decibels (dBA). On this scale, the normal range of human hearing extends from approximately 10 dBA to approximately 140 dBA. Listed in Exhibit 3.16-1 are several examples of the noise levels associated with common noise sources.

NOISE DESCRIPTORS

The intensity of environmental noise fluctuates over time, and several descriptors of time-averaged noise levels are used. The three most commonly used descriptors are L_{eq}, L_{dn}, and CNEL. The energy-equivalent noise level, L_{eq}, is a measure of the average energy content (intensity) of noise over any given period. Many communities use 24-hour descriptors of noise levels to regulate noise. The day-night average noise level, L_{dn}, is the 24-hour average of the noise intensity, with a 10-dBA "penalty" added for nighttime noise (10 p.m.–7 a.m.) to account for the greater sensitivity to noise during this period. CNEL, the community equivalent noise level, is similar to L_{dn} but adds an additional 5-dBA "penalty" for evening noise (7–10 p.m.). Another descriptor that is commonly discussed is the single-event noise exposure level (SENEL), also referred to as the sound exposure level (SEL). The SENEL/SEL describes a receiver's cumulative noise exposure from a single noise event, which is defined as an acoustical event of short duration (such as a backup beeper, the sound of an airplane traveling overhead, or a train whistle) and involves a change in sound pressure above a defined reference value (usually approximately 40 dBA). Noise analyses may also depend on measurements of L_{max}, the maximum instantaneous noise level during a specific period of time, and L_{min}, the minimum instantaneous noise level during a specific period.

CHARACTERISTICS OF SOUND PROPAGATION AND ATTENUATION

Noise can be generated by a wide variety of sources—both mobile sources, such as automobiles, trucks, and airplanes, and stationary sources, such as machinery and industrial operations. Noise generated by mobile sources typically attenuates (is muffled or reduced) at a rate of 3.0–4.5 dBA per doubling of distance, depending on the ground surface and the number or type of objects between the noise source and the receiver. Hard and flat surfaces such as concrete or asphalt have an attenuation rate of 3.0 dBA per doubling of distance. Soft surfaces such as uneven or vegetated terrain have an attenuation rate of approximately 4.5 dBA per doubling of distance. Noise generated by stationary sources typically attenuates at a rate of 6.0 dBA per doubling of distance from the source.



* dB are "average" values as measured on the A-scale of a sound-level meter.
From Concepts in Architectural Acoustics: M. David Egan, McGraw Hill, 1972 and U.S. Department of Housing and Urban Development, Office of Community Planning and Development "The Noise Guidebook."

Source: EDAW 2003

Typical Noise Levels

EXHIBIT 3.16-1

Sound levels can be reduced by placing barriers between the noise source and the receiver. In general, barriers contribute to decreasing noise levels only when the structure breaks the "line of sight" between the source and the receiver. Buildings, concrete walls, and berms can all act as effective noise barriers. Wooden fences or broad areas of dense foliage also can reduce noise but are less effective than solid barriers.

HUMAN RESPONSE TO NOISE

The human response to environmental noise is subjective and varies considerably from individual to individual. Noise in the community has often been cited as a health problem, not in terms of actual physiological damage such as hearing impairment, but in terms of inhibiting general well-being and contributing to undue stress and annoyance. The health effects of noise in the community arise from interference with human activities, including sleep, speech, recreation, and tasks that demand concentration or coordination. Hearing loss can occur at the highest noise intensity levels. When community noise interferes with human activities or contributes to stress, public annoyance with the noise source increases. The acceptability of noise and the threat to public well-being are the basis for land use planning policies that prohibit exposure to excessive community noise levels.

Because construction activities typically are short term, the associated effects of construction-generated noise typically are limited to annoyance and interference with speech. In an exterior noise environment, noise levels in excess of 60 dBA are generally considered to have an appreciable degree of speech interference. The level at which speech interference occurs is based on an average sentence comprehension rate of approximately 98% at 5 meters. Greater speaker-listener distances would be possible indoors at the same level of vocal effort and speech intelligibility because sound pressure levels diminish more slowly than predicted by the inverse-square law, which is typically used in the exterior environment (EPA 1971).

Unfortunately, there is no completely satisfactory way to measure the subjective effects of noise or of the corresponding reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance and habituation to noise over differing individual experiences with noise. Thus, an important way to determine a person's subjective reaction to a new noise is to compare the new noise to the existing environment to which one has adapted: the so-called "ambient" environment. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by the hearers. Regarding increases in A-weighted noise levels, knowledge of the following relationships (EPA 1971) will be helpful in understanding this analysis:

- Except in carefully controlled laboratory experiments, a change of 1 dB cannot be perceived by humans.
- Outside of the laboratory, a 3-dB change is considered a just-perceivable difference.
- A change in level of at least 5 dB is required before any noticeable change in community response would be expected.

A 10-dB change is subjectively heard as approximately a doubling in loudness and would almost certainly cause an adverse change in community response.

EXISTING NOISE ENVIRONMENT

Project Location

The project site consists of approximately 3,828 acres in Rancho Cordova. Surrounding land uses generally include the Security Park (a privately owned industrial park) to the southeast; industrial land uses along the Sunrise Boulevard corridor to the west; and heavy industrial uses by Aerojet General Corporation (Aerojet) to the north. Residential land uses are currently being developed to the south of the project site, across Douglas Road. In

addition, portions of the project site are located below the approach and departure flight paths of Mather Airport, which is located approximately 1 mile east of the project site.

Ambient-Noise Survey

To document the existing noise environment, ambient-noise surveys were conducted at various locations within the project site and in the surrounding area. The daytime A-weighted sound levels (i.e., weighted to represent the frequency range of human hearing) measured during the surveys are summarized in Table 3.16-1. Based on the measurements conducted, average daytime noise levels (in dBA L_{eq}) within the project site and the surrounding area generally range from the mid-60s to the upper 60s, depending primarily on distance from nearby roadways, Mather Airport flight paths, and nearby industrial land uses.

Table 3.16-1
Daytime Ambient-Noise Levels

Location	Noise Sources	Date/Time	A-Weighted Sound Level (dBA)	
			L_{eq}	L_{max}
Douglas Road, east of Sunrise Boulevard	Vehicle traffic on Douglas Road and Sunrise Boulevard	2/4/04 10:55–11:10	66.5	86.6
		2/4/05 12:15–12:30	67.4	87.5
Mechanical Drive, east of Luyung Drive	Vehicle traffic on Sunrise Boulevard and Luyung Drive; helicopter overflight on approach to Mather Airport	2/4/04 11:20–11:35	54.3	68.8
	Vehicle traffic on Sunrise Boulevard and Luyung Drive	2/4/05 13:40–13:55	52.4	57.5
Gold Dredge Way, east of Luyung Drive	Vehicle traffic on Luyung Drive; operation of gunite batch plant and front-end loader at 35 yards	2/4/04 11:40–11:50	66.4	75.2
	Vehicle traffic on Luyung Drive	2/4/05 13:05–13:20	62.3	67.2
Manufacturers Road, east of Luyung Drive	Vehicle traffic on Luyung Drive	2/4/04 12:00–12:15	53.0	67.6
	Vehicle traffic on Luyung Drive; aircraft overflight on approach to Mather Airport	2/4/05 14:15–14:35	58.1	76.8
White Rock Road, east of Luyung Drive	Vehicle traffic on White Rock Road and Luyung Drive	2/4/04 12:20–12:35	68.3	86.8
		2/4/05 14:55–15:10	67.4	86.3
Sunrise Boulevard, north of Douglas Road	Vehicle traffic on Sunrise Boulevard and Douglas Road; weapons fire from Cordova Shooting Center discernible, at times, but not above measured traffic L_{max}	2/4/05 11:30–11:45	68.3	89.2

Measurements were conducted using a Larson Davis 820 sound level meter placed 4.5 feet above ground surface, calibrated before and after each measurement.
Source: Data provided by Ambient Air Quality & Noise Consulting 2004, 2005

EXISTING NOISE SOURCES

The existing noise environment in and surrounding the project site is influenced primarily by aircraft noise associated with flights to and from Mather Airport, surface-transportation noise emanating from vehicular traffic on area roadways, and industrial-related noise from surrounding land uses. To a lesser extent, ambient noise levels at the project site are also influenced by noise generated by nearby commercial and industrial land uses, including Aerojet, and weapons fire emanating from the Cordova Shooting Center, which is located at the northwest corner of the Douglas Road/Sunrise Boulevard intersection. Noise levels associated with these transportation and nontransportation noise sources, as perceived within the vicinity of the project site, are discussed separately below.

Mather Airport

Mather Airport (formerly Mather Air Force Base [AFB]) has been open as a public-use air cargo and general-aviation airport since May 5, 1995. Managed by the County of Sacramento (County) Department of Airports, the airport, which operates 24 hours per day, consists of two primary runways, one 11,300 feet long and the other 6,100 feet long, generally aligned in a northeast-to-southwest direction. Mather Airport is a joint-use facility that supports both military and commercial operations, and it is rapidly developing as an air cargo depot. The airport includes approximately 40 acres of exclusive air cargo ramp space.

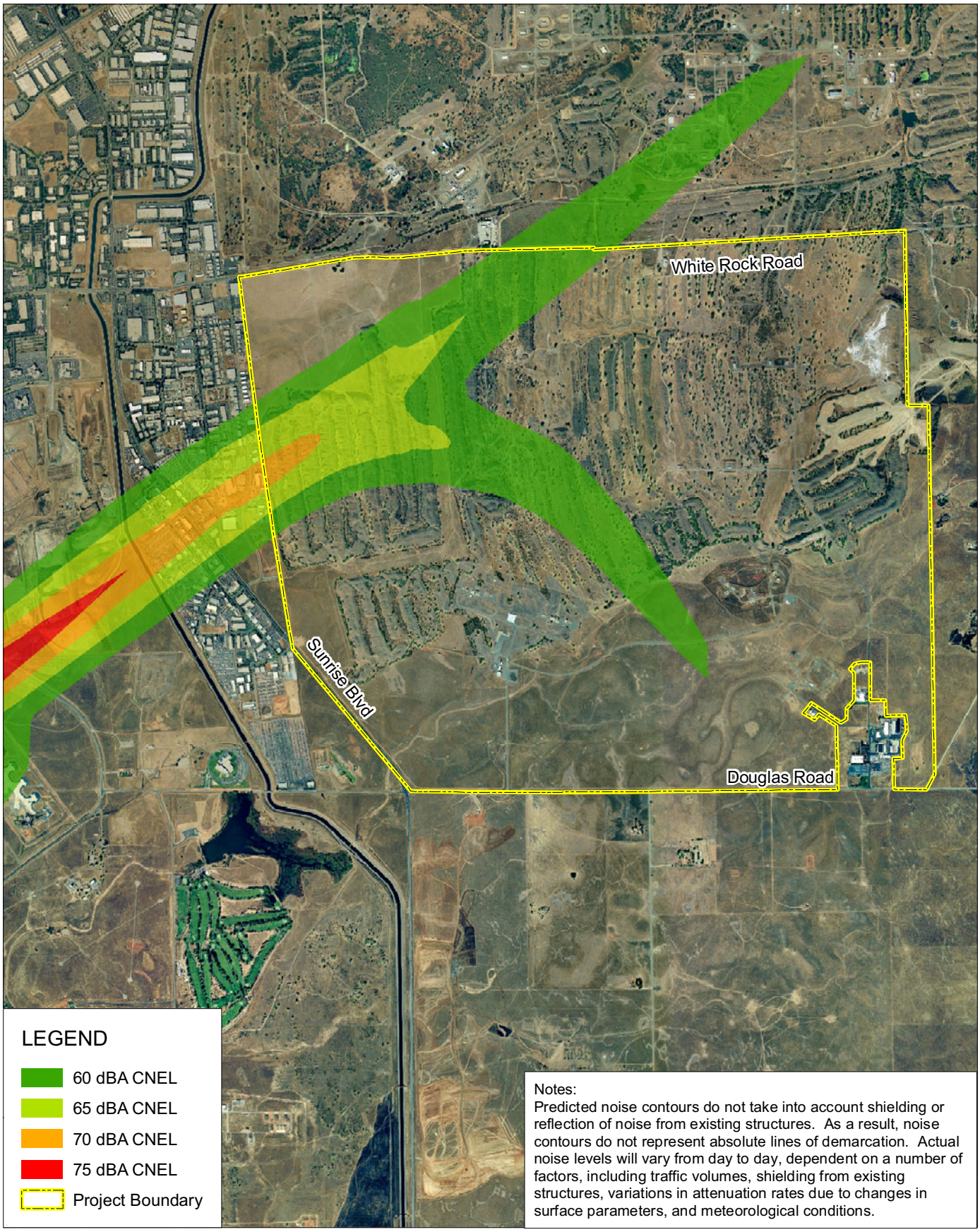
Following the closure of Mather AFB in 1988, the County adopted a reuse plan for Mather Airport in fall 1991. The Airport Land Use Compatibility Plan (ALUCP) for Mather Airport was subsequently adopted in May 1997. As depicted in Exhibit 3.16-2, portions of the project site are located within the currently adopted 60- and 65-dBA CNEL noise contours of the ALUCP for Mather Airport. These noise contours, however, have been proposed for revision as part of the development of the *Mather Airport Master Plan*, which is currently being prepared by the Sacramento County Airport System. The noise contours were revised to account for existing and projected changes in aircraft operations that have occurred since development of the ALUCP for Mather Airport. The proposed CNEL noise contours for Mather Airport, in relationship to the project site and proposed land uses, are presented in Exhibit 3.16-3.

Single-event noise associated with aircraft overflights is also of concern when evaluating aircraft noise effects in terms of land use compatibility. Single-event noise is the maximum sound level produced by an individual approach overflight at a specific location, often described in terms of L_{max}, which is the maximum sound level recorded for each event. A different measurement of single-event noise, also commonly used when evaluating aircraft noise, is the SEL. As mentioned above under "Noise Descriptors," the SEL describes the event's mean energy level over the duration of the noise event.

As would be expected, single-event noise levels for aircraft overflights within the project site would be greatest and most frequent near the airport's primary flight paths. Based on noise measurements conducted within the project site, beneath the approach flight path for instrument landing systems, single-event noise levels associated with aircraft overflights to Mather Airport ranged from 65 to 96 dBA L_{max} and from 71 to 102 dBA SEL.

Roadway Vehicle Traffic

Predicted roadway traffic noise levels were calculated using the Federal Highway Administration (FHWA) Traffic Noise Prediction Model (FHWA-RD-77-108), based on traffic data obtained from the traffic analysis prepared for this project. Additional input data included day/night percentages of automobiles, medium-duty trucks, and heavy-duty trucks; vehicle speeds; ground attenuation factors; and roadway widths. Existing traffic noise levels for area roadway segments most affected by implementation of the proposed project are summarized in Table 3.16-2. Actual noise levels will vary from day to day, dependent on various factors, including local traffic volumes, shielding from existing structures, variations in attenuation rates attributable to changes in surface parameters, and meteorological conditions.



Source: SACOG 2005

Adopted Mather Airport Land Use Compatibility Plan Noise Contours (1997)

EXHIBIT 3.16-2

Rio del Oro Specific Plan Project DEIR/DEIS
City of Rancho Cordova USACE
X 03110089.01 11/05

0 1,500 3,000 6,000
FEET

NORTH

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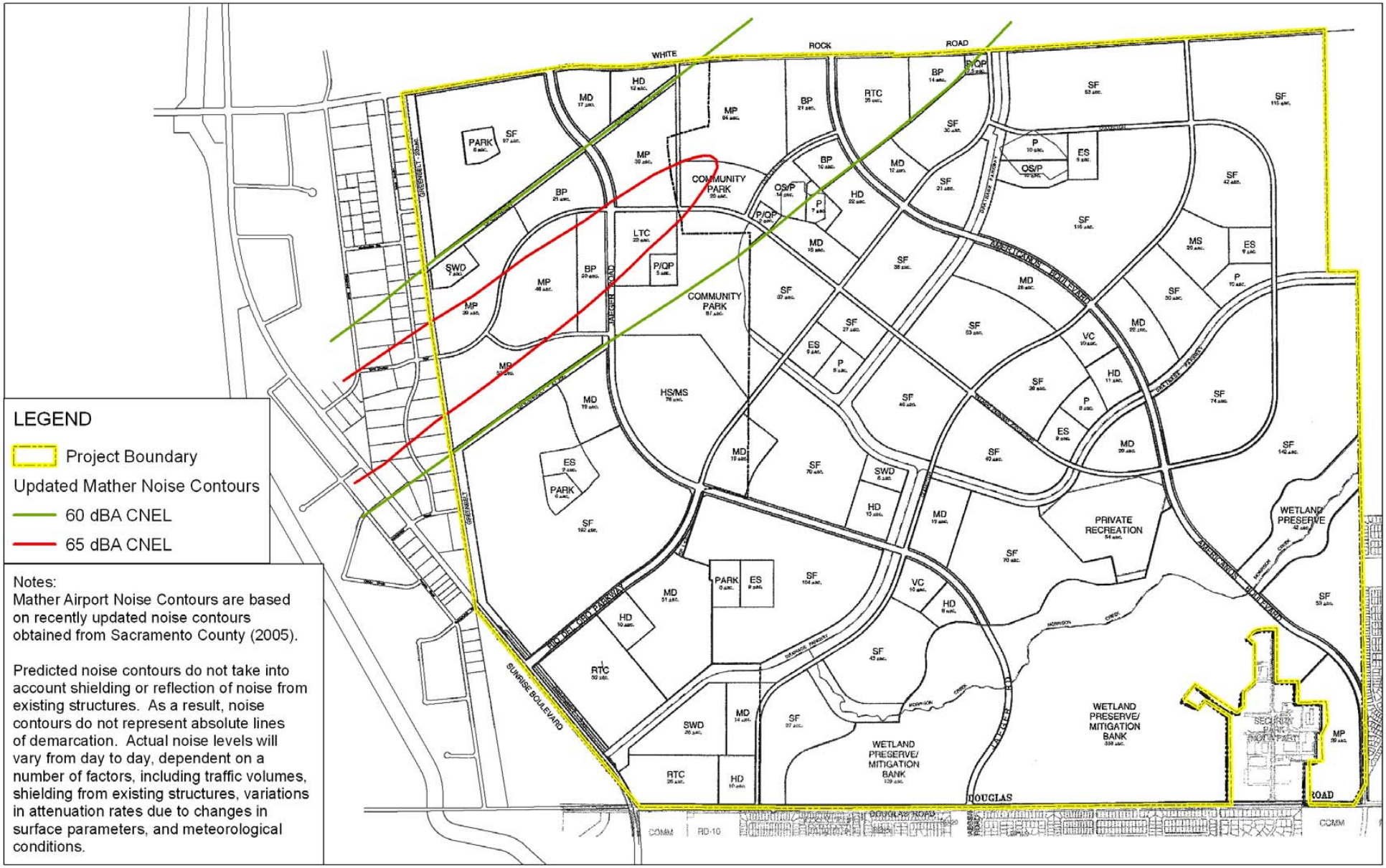

Source: G.C. Wallace 2005, SACOG 2005

Proposed Mather Airport Land Use Compatibility Plan Noise Contours (2005)

EXHIBIT 3.16-3

Rio del Oro Specific Plan Project DEIR/DEIS
City of Rancho Cordova USACE

0 1,050 2,100 4,200
FEET

NORTH

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X 03110089.01 11/05

Table 3.16-2
Summary of Modeled Existing Traffic Noise Levels

Roadway Segment	Between		CNEL/L_{dn} (dBA) 50 Feet from Centerline of Near Travel Lane	Distance (ft) from Roadway Centerline to CNEL/L_{dn} (dBA)			
				70 CNEL	65 CNEL	60 CNEL	55 CNEL
SR 16	Excelsior Road	Eagles Nest Road	72.42	81.0	174.0	374.7	807.0
SR 16	Sunrise Boulevard	Grant Line Road	73.73	98.9	212.6	457.9	986.2
Kiefer Boulevard	Grant Line Road	North of SR 16	62.42	0.0	0.0	80.9	174.0
Mather Boulevard	Femoyer Street	Douglas Road	67.65	0.0	83.8	180.2	174.0
Douglas Road	Mather Boulevard	Sunrise Boulevard	68.84	0.0	100.6	216.4	466.0
Douglas Road	Sunrise Boulevard	Grant Line Road	65.47	0	60.1	129	277.7
International Drive	South White Rock Road	Zinfandel Drive	69.59	64.1	133.7	286.0	615.1
International Drive	Zinfandel Drive	Sunrise Boulevard	67.12	0.0	92.5	196.3	421.5
White Rock Road	Zinfandel Drive	Sunrise Boulevard	70.51	85.6	175.4	373.4	802.3
White Rock Road	Sunrise Boulevard	Grant Line Road	68.29	0.0	92.4	198.7	427.9
Folsom Boulevard	Zinfandel Drive	Sunrise Boulevard	71.87	89.2	189.0	405.7	873.1
Folsom Boulevard	Sunrise Boulevard	Hazel Avenue	73.09	89.7	192.9	415.2	894.4
Mather Field Road	Folsom Boulevard	U.S. 50 WB ramps	73.01	105.6	224.9	483.2	1,040.2
Mather Field Road	U.S. 50 EB ramps	International Drive	73.26	125.9	265.2	568.3	1,222.8
Zinfandel Drive	Folsom Boulevard	U.S. 50 WB ramps	72.35	95.8	203.5	437.0	940.6
Zinfandel Drive	U.S. 50 EB ramps	White Rock Road	74.21	144.6	306.1	656.9	1,413.8
Zinfandel Drive	White Rock Road	International Drive	70.93	90.6	186.6	397.9	855.2
Sunrise Boulevard	Gold Country Boulevard	Coloma Road	76.78	212.1	453.3	974.7	2,098.8
Sunrise Boulevard	Coloma Road	U.S. 50 WB ramps	77.14	224.0	479.1	1030.5	2,218.9
Sunrise Boulevard	U.S. 50 EB ramps	Folsom Boulevard	75.15	166.3	353.5	759.4	1,634.7
Sunrise Boulevard	Folsom Boulevard	White Rock Road	73.69	134.0	283.0	606.9	1,306.0
Sunrise Boulevard	White Rock Road	Douglas Road	74.69	135.9	290.6	625.1	1,346.0
Sunrise Boulevard	Douglas Road	SR 16	74.86	117.6	253.1	545.0	1,173.9
Sunrise Boulevard	SR 16	Grant Line Road	71.20	67.2	114.4	310.7	669.2
Hazel Avenue	Winding Way	U.S. 50 WB ramps	76.04	166.6	357.2	768.6	1,655.2
Grant Line Road	White Rock Road	Douglas Road	69.64	53.0	113.5	244.3	526.1
Grant Line Road	Douglas Road	SR 16	70.12	57.0	122.2	262.9	566.3
Grant Line Road	SR 16	Sunrise Boulevard	69.34	50.6	108.5	233.3	502.5
U.S. 50	Mather Field Road	Zinfandel Drive	82.10	593.7	1,273.7	2741.2	5,903.4
U.S. 50	Zinfandel Drive	Sunrise Boulevard	81.46	539.0	4,455.4	2486.1	5,353.8
U.S. 50	Sunrise Boulevard	Hazel Avenue	81.02	466.2	1,000.1	2152.3	4,635.2
U.S. 50	Hazel Avenue	Folsom Boulevard	81.00	424.3	911.4	1,961.9	4,225.5

Notes: CNEL = community equivalent noise level; dBA = A-weighted decibels; EB = eastbound; ft = feet; L_{dn} = day-night average noise level; SR = State Route; U.S. 50 = U.S. Highway 50; WB = westbound

Traffic noise levels were modeled using the FHWA Traffic Noise Prediction Model (FHWA-RD-77-108) based on traffic data obtained from the traffic analysis prepared for this project (see Section 3.14, "Traffic and Transportation"). Modeling assumes no natural or human-made shielding (e.g., vegetation, berms, walls, buildings).

Source: Data provided by EDAW in 2005

Industrial Land Uses

Industrial land uses, located primarily along the Sunrise Boulevard corridor west of the project site, include a variety of operations: heavy-equipment repair facilities, equipment and material storage yards, loading-dock operations, concrete batch plants, and various manufacturing operations. Industrial land uses are also located in the Security Park (not part of the project), which is located along the southern boundary of the project site, north of Douglas Road. Hours of operation for these land uses vary, but are generally limited to daytime hours.

Noise levels associated with industrial land uses can vary greatly depending on the activities conducted. Activities involving the use of heavy-duty equipment such as front-end loaders, forklifts, and diesel-powered trucks are common noise sources typically associated with these land uses. Noise typically associated with industrial operations, including the use of heavy-duty equipment, can reach maximum levels of approximately 85 dBA at 50 feet (EPA 1971).

Aerojet General Corporation

Aerojet land is located south of U.S. Highway 50 (U.S. 50) between Mercantile Drive and Prairie City Road, north of the project site. Primary noise-generating activities at this facility have historically been associated with the testing of rocket and high-performance aircraft engines for use in military and aerospace applications. GenCorp Realty Investments, Aerojet's parent company, is currently in the process of phasing out the testing of the large-diameter rocket and aircraft engines at this facility, although testing of smaller engines would continue (Gunderson, pers. comm., 2005). The 65- and 75-dBA noise contours associated with the firing of smaller rocket engines (60,000 pounds of thrust) extend to approximately 7,920 and 4,224 feet, respectively, from the test stand. Additional on-site noise sources associated with this facility include industrial operations such as manufacturing, cleaning, maintenance, heating and cooling, and pollution control activities. Based on prior noise studies conducted at Aerojet, noise from these additional noise sources were not found to exceed County noise standards at nearby off-site receptors (County of Sacramento 1993).

Cordova Shooting Center

The Cordova Shooting Center is located at the northwest corner of the Douglas Road/Sunrise Boulevard intersection, approximately 900 feet west of the project site. The shooting center is described as a full-service shooting facility supporting the use of rifles, pistols, skeet, trap, and sporting clays. Hours of operation vary by season, but are generally limited to the daytime hours of 10 a.m.–8 p.m. on weekdays and 9 a.m.–6 p.m. on weekends. Shooting events such as skeet tournaments and club gatherings occasionally occur during the evening hours.

Noise levels generated by weapons fire depend on the weapons used, local shielding, and atmospheric conditions. Based on past noise measurements conducted at the Cordova Shooting Center, noise levels from weapons fire ranged from approximately 97 to 112 dBA per round at approximately 50 feet. Based on these noise levels, predicted maximum noise levels of 70 dBA could occur at a distance of one-half to 1 mile from this facility, depending on local shielding and atmospheric conditions (County of Sacramento 1993). During the periods for which daytime ambient-noise monitoring was being conducted, intermittent noise generated by weapons fire at the firing range, though discernible at times, was largely masked by noise emanating from vehicle traffic on nearby roadways (e.g., Sunrise Boulevard and Douglas Road).

3.16.2 REGULATORY FRAMEWORK

FEDERAL PLANS, POLICIES, REGULATIONS, AND LAWS

U.S. Department of Housing and Urban Development

The guidelines of the U.S. Department of Housing and Urban Development (HUD) for the acceptability of residential land uses are set forth in the Code of Federal Regulations, Title 24, Part 51, "Environmental Criteria and Standards." These guidelines identify a noise exposure of 65 dBA L_{dn} or less as acceptable. Noise levels of 65–75 dBA L_{dn} are considered normally acceptable, provided that appropriate sound attenuation is provided to reduce interior noise levels to within acceptable levels. Noise levels above 75 dBA L_{dn} are considered unacceptable. The goal of the interior noise levels is 45 dBA L_{dn}. These guidelines apply only to new construction supported by HUD grants and are not binding upon local communities.

STATE PLANS, POLICIES, REGULATIONS, AND LAWS

California Building Code

Title 24 of the California Code of Regulations establishes standards governing interior noise levels that apply to all new multifamily residential units in California. These standards require that acoustical studies be performed before construction begins at building locations where the existing day-night average noise level (L_{dn}) exceeds 60 dBA. Such acoustical studies are required to establish mitigation measures that will limit maximum L_{dn} to 45 dBA in any inhabitable room. Although there are no generally applicable interior noise standards pertinent to all uses, many communities in California have adopted an L_{dn} of 45 dBA as an upper limit on interior noise in all residential units.

General Plan Guidelines

The *State of California General Plan Guidelines*, published by the Governor's Office of Planning and Research (2003), provides guidance for the acceptability of projects within specific CNEL/L_{dn} contours. Table 3.16-3 summarizes acceptable and unacceptable community noise exposure limits for various land use categories. Generally, residential uses are considered to be acceptable in areas where exterior noise levels do not exceed 60 dBA CNEL/L_{dn}. Residential uses are normally unacceptable in areas exceeding 70 dBA L_{dn} and conditionally acceptable within 55–70 dBA L_{dn}. Schools are normally acceptable in areas up to 70 dBA CNEL and normally unacceptable in areas exceeding 70 dBA CNEL. Commercial uses are normally acceptable in areas up to 70 dBA CNEL. Between 67.5 and 77.5 dBA CNEL, commercial uses are conditionally acceptable, depending on the noise insulation features and the noise reduction requirements. The guidelines also present adjustment factors that may be used to arrive at noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution.

REGIONAL AND LOCAL PLANS, POLICIES, REGULATIONS, AND ORDINANCES

Mather Airport Land Use Compatibility Plan

The State of California has adopted airport noise and safety standards that are implemented through Comprehensive Land Use Plans (CLUPs) prepared for public-use airports. The CLUPs are prepared and maintained by the Airport Land Use Commissions (ALUCs). In Sacramento County, the Sacramento Area Council of Governments (SACOG) serves as the ALUC. The noise and safety standards identified in the CLUPs for local airports are implemented through the control of land use around airports with regard to the noise, safety, and height restrictions. SACOG also works with cities and counties to ensure consistency between local land use plans and CLUPs developed for local airports.

Table 3.16-3
State of California Noise Compatibility Guidelines by Land Use Category

Land Use Category	Community Noise Exposure (L_{dn} or CNEL, dBA)			
	Normally Acceptable[1]	Conditionally Acceptable[2]	Normally Unacceptable[3]	Clearly Unacceptable[4]
Residential—Low-Density Single-Family, Duplex, Mobile Home	<60	55–70	70–75	75+
Residential—Multiple-Family	<65	60–70	70–75	75+
Transient Lodging, Motel, Hotel	<65	60–70	70–80	80+
School, Library, Church, Hospital, Nursing Home	<70	60–70	70–80	80+
Auditorium, Concert Hall, Amphitheater		<70	65+	
Sports Arenas, Outdoor Spectator Sports		<75	70+	
Playground, Neighborhood Park	<70		67.5–75	72.5+
Golf Courses, Stable, Water Recreation, Cemetery	<75		70–80	80+
Office Building, Business Commercial, and Professional	<70	67.5–77.5	75+	
Industrial, Manufacturing, Utilities, Agriculture	<75	70–80	75+	

Notes: CNEL = community equivalent noise level; dBA = A-weighted decibels; L_{dn} = day-night average noise level

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

2 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.

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

4 New construction or development should generally not be undertaken.

Source: Governor's Office of Planning and Research 2003

The ALUCP for Mather Airport, formerly called the Mather Airport CLUP, was adopted in May 1997 and includes regional policies for land use compatibility with respect to aircraft noise. The ALUCP for Mather Airport requires that as development occurs in the area near the airport, affected cities and counties should evaluate the impact of aircraft noise on proposed development. The ALUCP prohibits new residential development within the 65-dBA CNEL noise contours. The ALUCP noise contours (in CNEL) for Mather Airport, in relation to the project site, are depicted in Exhibit 3.16-2.

In addition, the County is currently in the process of developing the *Mather Airport Master Plan*. The Master Plan will be used to guide airport development over the next 20 years, while attempting to resolve related aviation, environmental, and socioeconomic issues existing in the community. One of the primary issues to be addressed in the plan relates to the exposure of citizens in nearby communities to noise generated by aircraft on approach and departure routes from Mather Airport.

Rancho Cordova General Plan

The City of Rancho Cordova (City) was incorporated in July 2003, and the City adopted the *Rancho Cordova General Plan* (City General Plan) in June 2006. The General Plan Noise Element identifies noise criteria for various stationary and transportation noise sources. The Noise Element of the City General Plan supersedes the

Noise Element of the *County of Sacramento General Plan* (County General Plan) except where the City General Plan is silent on an issue (e.g., the Mather Airport Policy Area [MAPA], as described below).

Goals and policies of the City General Plan relating to noise that the City has found to be applicable to the proposed project and alternatives under consideration are provided in Appendix F. Performance standards for stationary noise sources and maximum allowable noise exposure from transportation noise sources, as specified in the Noise Element of the City General Plan, are included below as Tables 3.16-4, 3.16-5, and 3.16-6 because they are included in the thresholds for determining the significance of impacts for this analysis.

Table 3.16-4
Performance Standards for Typical Stationary Noise Sources—
Rancho Cordova General Plan Noise Element

Noise Level Descriptor	Daytime (7 a.m.–10 p.m.)	Nighttime (10 p.m.–7 a.m.)
Hourly L_{eq}, dB	55	45

Note: dB = decibels; L_{eq} = energy-equivalent noise level
Source: City of Rancho Cordova 2005a

Table 3.16-5
Performance Standards for Stationary Noise Sources that Are Tonal, Impulsive, Repetitive, or Consist Primarily of Speech or Music—Rancho Cordova General Plan Noise Element

Noise Level Descriptor	Daytime (7 a.m.–10 p.m.)	Nighttime (10 p.m.–7 a.m.)
Hourly L_{eq}, dB	50	40

Note: dB = decibels; L_{eq} = energy-equivalent noise level
Source: City of Rancho Cordova 2005a

Table 3.16-6
Maximum Allowable Noise Exposure, Transportation Noise Sources—
Rancho Cordova General Plan Noise Element

Land Use	Outdoor Activity Areas[1] L_{dn}/CNEL, dB	Interior Spaces	
		L_{dn}/CNEL, dB	L_{eq}, dB[2]
Residential	60[3]	45	–
Residential subject to noise from railroad tracks, aircraft overflights, or similar noise sources that produce clearly identifiable, discrete noise events (the passing of a single train, as opposed to relatively steady noise sources such as roadways)	60[3]	40[5]	–
Transient Lodging	60[4]	45	–
Hospitals, Nursing Homes	60[3]	45	–
Theaters, Auditoriums, Music Halls	–	–	35
Churches, Meeting Halls	60[3]	–	40
Office Buildings	–	–	45
Schools, Libraries, Museums	–	–	45
Playgrounds, Neighborhood Parks	70	–	–

Note: CNEL = community equivalent noise level; dB = decibels; L_{dn}= day-night average noise level; L_{eq} = energy-equivalent noise level
1 Where the location of outdoor activity areas is unknown, the exterior noise level standard shall be applied to the property line of the receiving land use. Where it is not practical to mitigate exterior noise levels at patio or balconies of apartment complexes, a common area such as a pool or recreation area may be designated as the outdoor activity area.
2 As determined for a typical worst-case hour during periods of use.
3 Where it is not possible to reduce noise in outdoor activity areas to 60 dB L_{dn}/CNEL or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB L_{dn}/CNEL may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.
4 In the case of hotel/motel facilities or other transient lodging, outdoor activity areas such as pool areas may not be included in the project design. In these cases, only the interior noise level criterion will apply.
5 The intent of this noise standard is to provide increased protection against sleep disturbance for residences located near railroad tracks.
Source: City of Rancho Cordova 2005a

The Noise Element of the County General Plan identifies the MAPA for properties located in the vicinity of Mather Field. The MAPA was approved by the County Board of Supervisors in 1998 and is intended to create additional protection beyond the restrictions described in the ALUCP for Mather Airport. As shown in Exhibit 3.16-2, a significant portion of the project site is located within the MAPA. In addition to prohibiting new residential development within the 65-dBA CNEL contour, per the ALUCP for Mather Airport, the MAPA prohibits new residential development within the 60-dBA CNEL contour. In addition, new residential development within the MAPA, but outside the 60-dBA CNEL contour, may be approved but will be subject to the following conditions:

- provision of minimum noise insulation to achieve 45 dB within new residential dwellings, including detached single-family dwellings, with windows closed in any habitable room;

- notification in the public report prepared by the California Department of Real Estate disclosing to prospective buyers that the parcel is located within the MAPA; and

an aviation easement prepared by the County Counsel's Office, granted to the County, recorded with the County Recorder, and filed with the County Department of Airports. Such an aviation easement shall acknowledge the property location within the MAPA and shall grant the right of flight and unobstructed passage of all aircraft into and out of Mather Airport.

City of Rancho Cordova Noise Ordinance

The City Noise Ordinance establishes maximum allowable exterior and interior noise levels for affected land uses. The standards from the City Noise Ordinance are summarized in Table 3.16-7. The ordinance generally limits exterior noise levels (measured at residential land and agricultural land uses) to a maximum of 55 dBA during any cumulative 30-minute period during the daytime hours (7 a.m.–10 p.m.), and 50 dBA during any cumulative 30-minute period during the nighttime hours (10 p.m.–7 a.m.). The ordinance sets somewhat higher noise limits for noise of shorter duration; however, noise shall not exceed 75 dBA during the day and 70 dBA at night. Activities generally considered to be exempt from the noise standards include construction activities (provided that they occur between the daytime hours of 7 a.m.–6 p.m., Monday through Saturday, and 9 a.m.–6 p.m. on Sunday), school athletic and entertainment events, activities conducted on public parks and playgrounds, and transportation noise.

3.16.3 ENVIRONMENTAL CONSEQUENCES

THRESHOLDS OF SIGNIFICANCE

The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines. These thresholds also encompass the factors taken into account under the National Environmental Policy Act (NEPA) to determine the significance of an action in terms of its context and the intensity of its effects. A noise impact is considered significant if implementation of the proposed project or alternatives under consideration would do any of the following:

- result in short-term noise levels during construction that would exceed applicable City noise standards (Tables 3.16-4 and 3.16-7) or result in increased levels of annoyance or sleep disruption during noise-sensitive periods of the day (for purposes of this analysis, between 7 p.m. and 7 a.m.);

- result in long-term stationary-source noise levels that would exceed applicable City noise standards (Tables 3.16-4, 3.16-5, and 3.16-7);

- result in a noticeable increase in traffic noise levels (i.e., 3 dBA CNEL or greater) or contribute to existing or predicted traffic noise levels that exceed applicable noise standards (Table 3.16-6) at noise-sensitive receptors (persons and land uses);

- result in predicted noise levels at on-site receptors exceeding applicable noise criteria for land use compatibility (Table 3.16-6); or

- expose on-site receptors to single-event aircraft noise that would result in potential speech interference or sleep disruption. For purposes of this analysis, speech interference and sleep disruption would be anticipated to occur at noise levels of 60 dBA and 80 dBA SEL, respectively (Caltrans 2002, FICON 1992).

The land use compatibility noise criteria in the City General Plan are listed in Table 3.16-6. Additional noise standards, including the State of California interior noise standards for multifamily residential dwellings (Title 24 of the California Code of Regulations) and the City noise standards for nontransportation noise sources (Tables 3.16-4, 3.16-5, and 3.16-7), were also taken into consideration.

Table 3.16-7
City of Rancho Cordova Noise Control Ordinance Standards

Land Use	Period of Measurement	Maximum Acceptable Noise Standards	
		Exterior Noise Standards[1]	Interior Noise Standards
Residential, School, Church, Hospital, Agricultural Land Uses	7 a.m.–10 p.m.	55 dBA[2]	-
	10 p.m.–7 a.m.	50 dBA[2]	-
Apartment, Condominium, Townhouse, Duplex, or Multidwelling Unit	10 p.m.–7 a.m.[3] 5 minutes/hour: 15 minutes/hour: Any period of time:	-	 45 dBA 50 dBA 55 dBA

Note: dBA = A-weighted decibels

[1] The following noise standards, unless otherwise specifically indicated in the City of Rancho Cordova Municipal Code, shall apply to all properties within a designated noise area.

[2] Cumulative duration of intrusive sound: It is unlawful for any person within the city to create any noise that causes the noise level on the affected property, when measured in the designated noise area, to exceed for the duration of time set forth following, the specified exterior noise standards in any one hour by (noise limits shall be reduced by 5 dBA for impulsive or simple tone noise, or noise consisting of speech or music):

A. 30 minutes: +0 dBA
B. 15 minutes: +5 dBA
C. 5 minutes: +10 dBA
D. 1 minute: +15 dBA
E. Level not to be exceeded for any time: +20 dBA

In addition to the above standards, interfering noise at schools, churches, or hospitals, while the same is in use, that is 10 dBA or more greater than the ambient noise level at the building, shall be deemed excessive and unlawful. Residential-use HVAC [heating, ventilation, and air conditioning] system equipment, such as pumps, fans, air conditioners, and cooling towers, shall not exceed 60 dBA at any point at least 1 foot inside the property line of the affected residential or agricultural property line, or 55 dBA when measured in the center of a neighboring patio or at the exterior window of the affected residential unit.

[3] Based on cumulative periods of time during any one hour. Interior noise levels, when measured in the neighboring unit, shall not exceed the specified standards for the corresponding cumulative period of time during any hour.

Source: City of Rancho Cordova Municipal Code, Noise Control Ordinance

ANALYSIS METHODOLOGY

Construction-noise and stationary-source noise impacts were calculated based on the distance from source to receptor, assuming an average noise attenuation rate of 6 dBA per doubling of distance. The FHWA Roadway Noise Prediction Model (FHWA-RD-77-108) was used to calculate traffic noise levels along affected roadways, based on estimates of average daily traffic volumes obtained from the traffic analysis prepared for this project.

Increases in traffic noise levels attributable to the proposed project and alternatives under consideration were calculated by comparing the predicted noise levels at 50 feet from the centerline of the near travel lane with and without project-generated traffic, under baseline conditions.

Program Level Impacts and Mitigation Measures

Effects that would occur under each alternative development scenario are identified as follows: PP (Proposed Project), HD (High Density), IM (Impact Minimization), NF (No Federal Action), and NP (No Project). The impacts for each alternative are compared relative to the PP at the end of each impact conclusion (i.e., similar, greater, lesser).

IMPACT 3.16-1

Temporary Exposure to Construction-Generated Noise. *Project construction activities could temporarily exceed applicable standards at nearby noise-sensitive receptors.*

PP, HD, IM, NF

The project includes a mix of land uses, including residential, commercial, industrial, schools, and open space. Construction of on-site public services, utilities, and other infrastructure improvements, such as roadways and bicycle paths, would be needed to support development of the project. Off-site improvements for proposed roadway alignments and utility construction would also be necessary, including new buildings, parking lots, utility relocations and installations, and roadway construction. Construction of the proposed land uses and improvements would occur in multiple phases over an approximately 20-year buildout period.

Construction noise typically occurs intermittently and varies depending upon the nature or phase of construction (e.g., demolition/land clearing, grading and excavation, erection). Construction noise in any one particular area would be temporary and would include noise from activities such as site preparation, truck hauling of material, pouring of concrete, and use of power tools. Noise would also be generated by construction equipment, including earthmovers, material handlers, and portable generators, and could reach high levels for brief periods. Although noise ranges are generally similar for all construction phases, the grading phase tends to involve the most equipment. The U.S. Environmental Protection Agency (EPA) has found that the noisiest equipment types operating at construction sites typically range from 88 dBA to 91 dBA L_{max} at 50 feet (Table 3.16-8). Typical operating cycles may involve 2 minutes of full power, followed by 3 or 4 minutes at lower settings. Average noise levels at construction sites typically range from approximately 65 to 89 dBA L_{eq} at 50 feet, depending on the activities performed (EPA 1971).

The City Noise Ordinance exempts construction operations that occur during the hours of 7 a.m.–6 p.m. Monday through Saturday and 9 a.m.–6 p.m. on Sundays. Construction activities that do not occur during these specified hours are not exempt and would be required to comply with the standards in the City Noise Ordinance and performance standards in the Noise Element of the City General Plan. Activities occurring during the more noise-sensitive evening and nighttime hours of 6 p.m.–7 a.m. Monday through Saturday or 6 p.m.–9 a.m. Sunday are of increased concern given the potential for increased levels of annoyance and potential sleep disruption to occupants of the nearby residential dwellings south of Douglas Road in the SunRidge Specific Plan area. In addition, implementation of the phased development of the site would result in potential disruption of on-site sensitive receptors. It is important to note that currently the only noise-sensitive land uses are the newly developing residential areas south of Douglas Road in the SunRidge Specific Plan area. However, phased development of the project site would result in potential internal noise conflicts.

Table 3.16-8
Construction Equipment Noise Levels

Type of Equipment	Typical Noise Level (dBA) at 50 feet	
	Without Feasible Noise Control	With Feasible Noise Control [1]
Dozer or Tractor	80	75
Excavator	88	80
Compactor	82	75
Front-end Loader	79	75
Backhoe	85	75
Grader	85	75
Crane	83	75
Generator	78	75
Truck	91	75

Note: dBA = A-weighted decibels

[1] Feasible noise control includes the use of intake mufflers, exhaust mufflers, and engine shrouds in accordance with manufacturer's specifications.

Source: EPA 1971

In addition, construction operations occurring during the daytime hours and in the vicinity of schools or other noise-sensitive daytime land uses such as childcare and convalescent care facilities, hospitals, residences, or places of worship may result in increased interior noise levels. Increases in interior daytime noise levels in excess of 45 dBA L_{eq}, particularly within school classrooms, are typically considered to result in a potentially significant noise impact (Caltrans 2002). Assuming an average exterior-to-interior noise reduction of 20 dBA (with windows closed), exterior construction-generated noise levels in excess of 65 dBA at the façade of a building would be considered to result in potential increases in interior noise levels in excess of 45 dBA L_{eq}. Based on this same assumption, and assuming a maximum construction noise level of 89 dBA L_{eq} and an average attenuation rate of 6 dBA per doubling of distance from the source, construction activities located within approximately 800 feet of daytime noise-sensitive receptors could result in interior noise levels in excess of 45 dBA L_{eq}. Construction-generated noise would therefore be considered to result in a **direct**, **potentially significant** temporary noise impact on nearby noise-sensitive land uses. **No indirect** impacts would occur. ***[Similar]***

NP Under the No Project Alternative, mining activities at the project site, which are not part of the Rio del Oro project, would continue under existing Conditional Use Permits—one originally issued by the County, and the other issued by the City—and possibly under one or more future individual Implementation Permits expected to be issued by the City. Environmental-acoustics analyses were conducted for both of the currently permitted mining sites (see the *Aerojet Mining Amendment Mitigated Negative Declaration* [City of Rancho Cordova 2004] and the *Grantline West Mitigated Negative Declaration* [City of Rancho Cordova 2005b]). The results of these analyses indicated that mining activities would not exceed daytime-noise criteria listed in the County Noise Ordinance, which was the adopted ordinance at the time the Mitigated Negative Declarations were prepared. The nearest residences are located 1,200 feet from the Aerojet Mining Amendment site and 5,000 feet from the Grantline West mining site. Results of the environmental-acoustics analyses indicated that under worst-case scenarios, when equipment would be operating closest to these residences, noise levels would not exceed daytime-noise

criteria listed in the County Noise Ordinance. Because no new project-related construction would occur under the No Project Alternative, no sensitive receptors would be exposed to construction noise; thus, no direct or indirect impacts would result. ***[Lesser]***

Mitigation Measure 3.16-1: Implement Measures to Prevent Exposure of Sensitive Receptors to Temporary Construction-Generated Noise.

PP, HD, IM, NF To reduce impacts associated with noise generated during construction activities, the project applicant(s) for all project phases shall conform to the following requirements:

- Noise-generating construction operations shall be limited to the hours between 7 a.m. and 7 p.m. Monday through Friday, and between 8 a.m. and 6 p.m. on Saturday and Sunday.
- All construction equipment and equipment staging areas shall be located as far as possible from nearby noise-sensitive land uses.
- All construction equipment shall be properly maintained and equipped with noise-reduction intake and exhaust mufflers and engine shrouds, in accordance with manufacturers' recommendations. Equipment engine shrouds shall be closed during equipment operation.
- All motorized construction equipment shall be shut down when not in use to prevent idling.
- The following measures shall be required for exterior activities that involve the use of heavy-duty construction equipment (see Table 3.16-8) located within 800 feet of occupied noise-sensitive daytime land uses (e.g., school classrooms, childcare and convalescent care facilities, inpatient medical facilities, places of worship):
  - Individual operations and techniques shall be replaced with quieter procedures (e.g., using welding instead of riveting, mixing concrete off-site instead of on-site).
  - Written notification of construction activities shall be provided to all noise-sensitive receptors located within 800 feet of construction activities. Notification shall include anticipated dates and hours during which construction activities are anticipated to occur and contact information, including a daytime telephone number, for the project representative to be contacted in the event that noise levels are deemed excessive. Recommendations to assist noise-sensitive land uses in reducing interior noise levels (e.g., closing windows and doors) shall also be included in the notification.
  - To the extent feasible, acoustic barriers (e.g., lead curtains, sound barriers) shall be constructed to reduce construction-generated noise levels at affected noise-sensitive land uses. The barriers shall be designed to obstruct the line of sight between the noise-sensitive land use and on-site construction equipment. When installed properly, acoustic barriers can reduce construction noise levels by approximately 8–10 dBA (EPA 1971).

Timing: During all phases of project construction.

Enforcement: City of Rancho Cordova Planning Department.

NP No mitigation measures are required.

With implementation of Mitigation Measure 3.16-1, construction would be limited to daytime hours, for which associated noise levels are considered exempt from the provisions of the City Noise Ordinance, and equipment

would be properly maintained, sound barriers installed, and setbacks established, resulting in levels below the City's noise standards. Therefore, implementation of this mitigation measure would reduce potentially significant impacts from temporary construction noise under the Proposed Project, High Density, Impact Minimization, and No Federal Action Alternatives to a **less-than-significant** level.

IMPACT 3.16-2

Potential Exposure to Stationary-Source Noise Generated by On-site Land Uses. *Project implementation could result in potential exposure of sensitive receptors to noise levels from on-site stationary sources in excess of applicable standards.*

PP, HD, IM, NF

The land use plans under the Proposed Project, High Density, Impact Minimization, and No Federal Action Alternatives feature a mix of various land uses, including residential, industrial, commercial, office, schools, parks, public/institutional land uses, and potentially an amphitheater. The sources and levels of noise typically associated with these land uses are discussed separately below.

Residential Land Uses

Occupation of the proposed residential dwellings would expose nearby residences to minor increases in ambient noise levels. Noise typically associated with such development includes amplified music, adults' and children's voices, and noise generated by various recreational activities and lawn maintenance equipment. Activities associated with these land uses would result in only minor and intermittent temporary increases in ambient noise levels, as perceived at the closest residential receptors, primarily during the day and evening hours and less frequently at night. Stationary sources of noise associated with residential land uses are typically limited to the operation of exterior central air conditioning units. Residential-use central air conditioning units typically average approximately 60 dBA or less at 3 feet from the source (EPA 1971). Depending on the distance between residential dwellings, noise levels associated with air conditioning units located within side-yard areas of residential land uses could potentially exceed the City's noise standards. As a result, increased noise levels associated with the proposed residential land uses are considered a **potentially significant, direct** impact. **No indirect** impacts would result.

Commercial, Office, and Industrial Land Uses

As discussed previously, the project includes plans for the development of various commercial, office, and industrial land uses. Potential sources of noise associated with these types of land uses can vary substantially. Noise associated with office and public land uses might be limited to occasional parking lot–related noise (e.g., opening and closing of doors, and people talking); however, commercial and light-industrial land uses may include additional noise sources such as the use of forklifts for loading and unloading of materials, as well as the operation of hydraulic lifts, pneumatic tools, and air compressors at automotive repair facilities. Early-morning truck deliveries may also be a source of elevated noise levels at nearby sensitive receptors. Noise from such equipment and activities can reach intermittent levels of up to 90 dBA at 50 feet from the source (EPA 1971). In addition, mechanical equipment (e.g., heating, ventilation, and air conditioning [HVAC] equipment) housed on the exterior of buildings is also a potential stationary source of noise, especially if these pieces of equipment are not properly enclosed. Based on this noise level, and assuming an attenuation rate of 6 dBA per doubling of distance from the source, areas within approximately 2,500 feet could experience noise levels in excess of 55 dBA.

Operational noise levels associated with the proposed commercial, office, industrial, and public land uses could potentially exceed the City's noise standards at nearby existing and future noise-sensitive receptors. In addition, increases in single-event noise levels, such as backup alarms

from material delivery trucks, occurring during the more noise-sensitive evening and nighttime hours could result in increased levels of disturbance and sleep disruption to occupants of nearby residential dwellings. As a result, increased noise levels associated with the proposed commercial land uses are considered a **potentially significant, direct** impact. **No indirect** impacts would result.

Schools and Neighborhood Parks

The project includes development of school-related uses and neighborhood parks. Noise-generating activities occurring at such facilities would be controlled by the school and the recreation and park districts, and would depend on facility type. Daytime noise typically associated with schools and neighborhood parks typically includes intermittent noise such as adults' and children's voices, opening and closing of vehicle doors in parking lots, and use of landscape maintenance equipment. School uses may also result in mechanical noise associated with building ventilation systems. Maximum intermittent noise levels commonly associated with parking lots can reach levels of 70 dBA at 500 feet from the occasional sounding of car alarms and amplification of music. Noise levels associated with landscape maintenance activities, including the use of large gasoline-powered mowers and leaf blowers, can range from approximately 66 to 72 dBA at 25 feet. Mechanical noise associated with operation of ventilation equipment required to service school facilities can result in average noise levels of 55 dBA at approximately 175 feet from the source.

Recreational facilities at neighborhood parks, middle schools, and high schools can generate additional noise extending into the evening and nighttime hours during competitive sporting events (e.g., soccer games, football games, and track and field events). Noise sources commonly associated with these types of events include elevated voices from crowds, exterior public-address systems, and musical instruments. Based on noise measurements conducted for similar projects, noise levels typically associated with recreational events (such as soccer games), including noise from spectators and players, can exceed 50 dBA L_{eq} within 800 feet of the event. If an amplified speaker system is used during sporting events, additional increases in ambient noise levels could occur. Activities occurring during the more noise-sensitive evening and nighttime hours may result in increased levels of annoyance and sleep disruption for occupants of nearby residential dwellings. As a result, increased noise levels associated with the proposed schools and neighborhood parks are considered a **potentially significant, direct** impact. **No indirect** impacts would result.

Sports Park and Amphitheater

The project may also include an outdoor sports facility/adult sports park. If constructed, the sports facility would be located on 40 acres currently proposed for Industrial Park land uses adjacent to and south of White Rock Road, north of the proposed Community Park. Uses at this facility could include a water slide park, softball complex, soccer fields, and/or a stadium/amphitheatre with capacity to accommodate approximately 3,000 people.

The proposed use of the amphitheater has not yet been specified, although it would likely be used for regional and community events, such as plays, recitals, community celebrations, and concerts. Noise levels generated by amphitheaters are primarily a function of the type of performance to be provided. Noise levels can vary substantially depending on the use. For instance, sound levels associated with symphony orchestra typically average approximately 90 dBA; whereas sound levels from a rock concert with an amplified speaker system can reach levels of approximately 120 dBA at 6 feet (EDAW 2003). Because noise associated with such events is typically

directional, noise levels at equivalent distances to the rear and sides of the amphitheater stage would likely be considerably less than sound levels at areas located directly in front of the stage.

It is anticipated that noise-sensitive receptors that would be affected by amphitheater noise would be residential dwellings located on parcels in the line of site of the stage. However, development of these parcels would occur as part of future project phases and the proximity of future residential development to the amphitheater is currently unknown.

Assuming a maximum noise generation potential of 120 dBA at 6 feet, predicted maximum noise levels at the property line of the residences approximately 1,000 feet away would be approximately 76 dBA. This would exceed City's noise standards and would also result in a substantial increase in ambient noise levels, particularly during the quieter late evening and nighttime hours. As a result, noise generated by the proposed amphitheater uses would be considered to have a **potentially significant** impact to nearby noise-sensitive land uses.

In summary, noise levels generated by on-site stationary sources could result in noise levels at nearby sensitive receptors that would exceed the City's maximum allowable noise standards. In addition, increases in single-event noise levels, such as backup alarms from material delivery trucks at commercial land uses and exterior public-address systems at schools and recreational facilities, could result in increased levels of disturbance and sleep disruption to occupants of nearby residential dwellings, particularly during the more noise-sensitive evening and nighttime hours. This is considered a **direct**, **potentially significant** impact. **No indirect** impacts would occur. ***[Similar]***

NP Under the No Project Alternative, mining activities at the project site, which are not part of the Rio del Oro project, would continue under existing Conditional Use Permits—one originally issued by the County, and the other issued by the City—and possibly under one or more future individual Implementation Permits expected to be issued by the City. Environmental-acoustics analyses were conducted for both of the currently permitted mining sites (see the *Aerojet Mining Amendment Mitigated Negative Declaration* [City of Rancho Cordova 2004] and the *Grantline West Mitigated Negative Declaration* [City of Rancho Cordova 2005b]). The results of these analyses indicated that mining activities would not exceed daytime noise criteria in the County Noise Ordinance, which was the adopted ordinance at the time the Mitigated Negative Declarations were prepared. The nearest residences are located 1,200 feet from the Aerojet Mining Amendment site and 5,000 feet from the Grantline West mining site. Results of the environmental-acoustics analyses indicated that under worst-case scenarios, when equipment would be operating closest to these residences, noise levels would not exceed daytime noise criteria in the County Noise Ordinance.

Because no project-related stationary-noise sources would be introduced under the No Project Alternative, no sensitive receptors would be exposed to on-site stationary noise sources; thus, **no direct** or **indirect** impacts would result. ***[Lesser]***

Mitigation Measure 3.16-2: Implement Measures to Reduce Potential Exposure of Sensitive Receptors to Stationary Source–Generated Noise.

PP, HD, IM, NF To reduce potential long-term exposure of sensitive receptors to noise generated by City-controlled, project-related stationary noise sources from private activities, the City shall evaluate individual facilities, subdivisions, and other project elements for compliance with the City Noise Ordinance and policies contained in the City General Plan. All project elements shall comply with City noise standards. The project applicant(s) for all project phases shall implement the

following measures to assure maximum reduction of project interior and exterior noise levels from operational activities.

- The proposed land uses shall be designed so that on-site mechanical equipment (e.g., HVAC units, compressors, generators) and area-source operations (e.g., loading docks, parking lots, and recreational-use areas) are located as far as possible from or shielded from nearby noise-sensitive land uses.

- Residential air conditioning units shall be located a minimum of 10 feet from adjacent residential dwellings, including outdoor entertainment and relaxation areas, or shall be shielded to reduce operational noise levels at adjacent dwellings or designed to meet City noise standards. Shielding may include the use of fences or partial equipment enclosures. To be effective, fences or barriers need to be continuous or solid, with very few gaps, and must block the line of sight to windows of neighboring dwellings. Achieved noise reductions from fences or barriers can vary, but typically range from approximately 5 to 10 dBA, depending on construction characteristics, height, and location.

- To the extent feasible, residential land uses located within 2,500 feet and within the direct line of sight of major noise-generating commercial and industrial land uses (e.g., loading docks, manufacturing facilities, equipment/vehicle storage and repair facilities, and material processing areas such as concrete batch plants) shall be shielded from the line of sight of these facilities by construction of a sound barrier. To be effective, fences or sound barriers need to be continuous or solid, with very few gaps, and must block the line of sight to windows of neighboring dwellings. Achieved noise reductions from fences or barriers can vary, but typically range from approximately 5 to 10 dBA, depending on construction characteristics, height, and location. The developer shall obtain the services of a professional acoustician to determine the design and location of noise barriers to be constructed.

- Dual-pane, noise-rated windows; mechanical air systems; exterior wall insulation; and other noise-reducing building materials shall be used.

In addition, the City shall seek to reduce potential long-term exposure of sensitive receptors to noise generated by project-related stationary noise sources from public activities on school grounds, in neighborhood and community parks, and in open-space areas. Specifically, the City shall encourage the controlling agencies (i.e., schools and park and recreation districts) to implement measures to reduce project interior and exterior noise levels to within acceptable levels, including but not limited to the following:

- On-site landscape maintenance equipment shall be equipped with properly operating exhaust mufflers and engine shrouds, in accordance with manufacturers' specifications.

- For maintenance areas located within 500 feet of noise-sensitive land uses, the operation of on-site landscape maintenance equipment shall be limited to the least noise-sensitive periods of the day, between the hours of 7 a.m. and 7 p.m.

- Outdoor use of amplified sound systems within 500 feet of noise-sensitive land uses shall be permitted only between 7 a.m. and 10 p.m. Sunday through Thursday, and between 7 a.m. and 11 p.m. on Friday and Saturday.

- During subsequent environmental review of future project phases, the project applicant(s) shall demonstrate that the amphitheater and adjacent residences have been designed to reduce noise exposure to noise-sensitive uses to the maximum extent feasible. An acoustical engineer with experience in the prediction and mitigation of outdoor theater sound levels

shall be consulted prior to design and construction of the proposed amphitheater and residences proposed within 1,500 feet of the amphitheater. The acoustical engineer shall identify all feasible mitigation measures available for reducing noise-related impacts to nearby noise-sensitive receptors. Mitigation measures may include, but are not limited to, orientation and location of amphitheater, construction of noise barriers, limitations on speaker orientation, limitations on noise-generation levels, and hours of activity. The project applicant(s) shall incorporate the mitigation measures into the design and operation of the amphitheater and nearby residential uses.

Timing: During design review and before the approval of all improvement plans, where applicable for all project phases. For measures that the City should encourage other agencies to undertake, before the approval of final maps for all project phases for noise-generating school and park and recreation sites.

Enforcement: City of Rancho Cordova Building and Safety and Planning Departments.

NP No mitigation measures are required.

Compliance with the City Noise Ordinance and implementation of additional mitigation measures for the control of stationary-source noise, such as those identified above in Mitigation Measure 3.16-2, would reduce stationary-source noise levels under the Proposed Project, High Density, Impact Minimization, and No Federal Action Alternatives. However, stationary-source noise levels from activities on land uses over which the City has limited control could still result in noise levels at nearby sensitive receptors that exceed the City's maximum allowable noise standards. Therefore, this impact would remain **significant and unavoidable.**

IMPACT 3.16-3

Potential Exposure to Off-site Stationary-Source Noise. *Project implementation could result in exposure of proposed sensitive receptors to noise levels from off-site stationary sources in excess of applicable standards.*

PP, HD, IM, NF Ambient noise levels within the project site would be affected by nearby stationary-noise sources (nontransportation), including industrial, commercial, and recreational land uses. Noise levels associated with these land uses, and potential impacts on on-site receptors, are discussed separately below.

Industrial Land Uses

Industrial land uses, located primarily along the Sunrise Boulevard corridor west of the project site, include heavy-equipment repair facilities, equipment and material storage yards, loading-dock operations, concrete batch plants, and various manufacturing operations. Industrial land uses are also located in the Security Park, which is located adjacent to the project site along the southeastern boundary north of Douglas Road, but not part of the Rio del Oro project. Hours of operation for these land uses vary, but are generally limited to daytime hours.

Noise levels associated with industrial land uses can vary greatly depending on the activities conducted. Activities involving the use of heavy-duty equipment such as front-end loaders, forklifts, and diesel-powered trucks are common noise sources typically associated with these land uses. Noise from industrial activities, including the use of pneumatic tools and heavy-duty motorized equipment and vehicles, can range from approximately 65 to 85 dBA at 50 feet (EPA 1971). Assuming a maximum noise level of 85 dBA at 50 feet, areas located within approximately 1,500 feet of industrial land uses may be exposed to noise levels in excess of the City's daytime noise standard of 55 dBA, depending on the activities conducted.

The project proposes development of residential dwellings within 100 feet of existing industrial land uses located along the western boundary of the project site. As a result, predicted noise levels from existing industrial activities could potentially exceed the City's noise standards at these receptors. In addition, activities occurring during the more noise-sensitive evening and nighttime hours, such as loading-dock operations, may result in increased levels of annoyance and sleep disruption to occupants of nearby planned residential dwellings. Noise levels associated with existing industrial development adjacent to proposed residential housing are considered a **potentially significant, direct** impact. **No indirect** impacts would result.

Aerojet General Corporation

Aerojet land is located immediately north of the project site, between White Rock Road and U.S. 50. The primary noise-generating activities at this facility have historically been associated with the testing of rocket and high-performance aircraft engines for use in military and aerospace applications.

Aerojet is currently in the process of phasing out the testing of large rocket engines at this facility; however, the testing of small- to medium-sized rockets is anticipated to continue (Gunderson, pers. comm., 2005). Past noise studies conducted at this facility concluded that the 65- and 75-dBA noise contours for the testing of small- to medium-sized rocket engines (60,000 pounds of thrust or less) would extend to a maximum of approximately 7,920 and 4,224 feet, respectively, from the test stand. Noise from engine testing typically occurs during the daytime hours for periods of 1–60 seconds (County of Sacramento 1993). Additional on-site noise sources associated with this facility include industrial operations such as manufacturing, cleaning, maintenance, heating and cooling, equipment operations, and pollution control activities (County of Sacramento 1993; Gunderson, pers. comm., 2005). Noise from these additional noise sources can generate noise levels ranging from less than 50 dBA to approximately 110 dBA at 3 feet from the source (EPA 1971).

The nearest active rocket-engine testing pad is located more than 4,224 feet from the project site. Consequently, noise from ongoing rocket-engine testing at the Aerojet facility would not be anticipated to exceed City noise standards at proposed noise-sensitive land uses located within the project site. Thus, noise levels associated with Aerojet north of proposed residential housing are considered a **less-than-significant, direct** impact. **No indirect** impacts would result.

Cordova Shooting Center

The Cordova Shooting Center is located at 11551 Douglas Road, at the northwest corner of the Douglas Road/Sunrise Boulevard intersection, approximately 900 feet west of the project site. The shooting center includes outdoor rifle, pistol, skeet, trap, and sporting clay ranges. Hours of operation vary by season, but are generally limited to the daytime hours of 10 a.m.–8 p.m. on weekdays and 9 a.m.–6 p.m. on weekends. Shooting events, such as skeet tournaments, occasionally occur during the evening hours.

Noise levels generated by weapons fire are dependent on the weapons used, local shielding, and atmospheric conditions. Based on measurements conducted at the Cordova Shooting Center, noise levels from weapons fire ranged from approximately 97 to 112 dBA per round at 50 feet. Based on these noise levels, predicted maximum noise levels of 70 dBA could occur at a distance of one-half to 1 mile from this facility, depending on local shielding and atmospheric conditions (County of Sacramento 1993).

The nearest proposed residential land use is a 10-acre high-density housing development behind a proposed retail center in the southwestern portion of the project site, approximately one-half

mile from the Cordova Shooting Center. Intermittent noise generated by daytime weapons fire at the firing range, though discernible at times, would be largely masked by noise emanating from vehicle traffic on nearby roadways (i.e., Sunrise Boulevard and Douglas Road). However, weapons fire occurring during the quieter evening hours, such as tournament and club events occasionally held at the shooting center, would likely be increasingly discernible. Predicted noise levels at these nearest receptors could potentially exceed the City's noise standards. Shooting events occurring during the evening hours may result in increased levels of annoyance and potential sleep disruption to occupants of nearby planned residential dwellings. Noise levels associated with the existing Cordova Shooting Center in the vicinity of proposed residential housing are considered a **potentially significant, direct** impact. **No indirect** impacts would result.

In summary, noise levels generated by off-site stationary sources could result in noise levels at proposed receptors that would exceed the City's maximum allowable noise standards. This is considered a **potentially significant**, **direct** impact. **No indirect** impacts would occur. ***[Similar]***

NP Under the No Project Alternative, mining activities at the project site, which are not part of the Rio del Oro project, would continue under existing Conditional Use Permits—one originally issued by the County, and the other issued by the City—and possibly under one or more future individual Implementation Permits expected to be issued by the City. However, continued mining at the current mining sites would not result in exposure of workers to off-site stationary-source noise in excess of the City Noise Ordinance.

Because no new sensitive receptors would be introduced to the project site under the No Project Alternative, no sensitive receptors would be exposed to off-site stationary noise sources; thus, **no direct** or **indirect** impacts would result. ***[Lesser]***

Mitigation Measure: Implement Mitigation Measure 3.16-2.

Compliance with the City Noise Ordinance and implementation of any additional mitigation measures for the control of stationary-source noise, such as those identified above in Mitigation Measure 3.16-2, would reduce stationary-source noise impacts under the Proposed Project, High Density, Impact Minimization, and No Federal Action Alternatives. Implementation of Mitigation Measure 3.16-2 would reduce interior noise levels to a less-than-significant level. However, exterior noise levels could still exceed applicable land-use compatibility noise standards. No additional feasible mitigation measures are available to further reduce exterior noise levels; therefore, this impact remains **significant and unavoidable.**

IMPACT 3.16-4 Project-Generated Increases in Traffic Noise Levels on Area Roadways. *Project implementation would introduce new traffic to area roadways, resulting in an associated increase in traffic noise levels.*

PP The increase in daily traffic volumes resulting from implementation of the Proposed Project Alternative would generate increased noise levels along nearby roadway segments as shown in Table 3.16-9. The FHWA Traffic Noise Prediction Model (FHWA 1988) was used to calculate traffic noise levels along affected roadways for baseline traffic conditions, with and without implementation of the Proposed Project Alternative, based on the trip distribution estimates obtained from the traffic analysis prepared for this project (see Section 3.14, "Traffic and Transportation"). The project's contribution, under the Proposed Project Alternative, to the existing traffic noise levels along area roadways was determined by comparing the predicted noise levels with and without project-generated traffic.

Table 3.16-9
Summary of Modeled Cumulative (Year 2030) Traffic Noise Levels

Roadway Segment	Between		Predicted Noise Level (dBA CNEL/L_{dn}) at 50 Feet from Near Travel Lane Centerline		
			Cumulative Without Project	Cumulative With Project	Difference
SR 16	Excelsior Road	Eagles Nest Road	73.88	73.88	0.00
SR 16	Sunrise Boulevard	Grant Line Road	73.99	74.04	0.05
Kiefer Boulevard	Grant Line Road	North of SR 16	71.36	71.97	0.61
Mather Boulevard	Femoyer Street	Douglas Road	71.97	72.23	0.26
Douglas Road	Mather Boulevard	Sunrise Boulevard	72.82	73.91	1.09
International Drive	South White Rock Road	Zinfandel Drive	75.56	76.90	1.34
International Drive	Zinfandel Drive	Kilgore Road	74.07	76.59	2.52
White Rock Road	Zinfandel Drive	Sunrise Boulevard	71.18	73.05	1.87
White Rock Road	Sunrise Boulevard	Grant Line Road	73.44	75.81	2.37
Folsom Boulevard	Zinfandel Drive	Sunrise Boulevard	72.80	72.92	0.12
Folsom Boulevard	Sunrise Boulevard	Hazel Avenue	73.99	74.06	0.07
Mather Field Road	Folsom Boulevard	U.S. 50 WB ramps	73.99	74.22	0.23
Mather Field Road	U.S. 50 EB ramps	International Drive	75.44	76.14	0.70
Zinfandel Drive	Folsom Boulevard	U.S. 50 WB ramps	72.47	72.80	0.33
Zinfandel Drive	U.S. 50 EB ramps	White Rock Road	76.30	77.16	0.86
Zinfandel Drive	White Rock Road	International Drive	74.51	74.88	0.37
Sunrise Boulevard	Gold Country Boulevard	Coloma Road	77.50	78.03	0.53
Sunrise Boulevard	Coloma Road	U.S. 50 WB ramps	78.04	78.60	0.56
Sunrise Boulevard	U.S. 50 EB ramps	Folsom Boulevard	75.19	76.23	1.04
Sunrise Boulevard	Folsom Boulevard	White Rock Road	74.26	75.71	1.45
Sunrise Boulevard	White Rock Road	Douglas Road	75.51	76.76	1.25
Sunrise Boulevard	SR 16	Grant Line Rd	72.73	73.32	0.59
Hazel Avenue	Winding Way	U.S. 50 WB ramps	77.79	78.09	0.30
Grant Line Road	White Rock Road	Douglas Road	74.50	74.63	0.13
Grant Line Road	Douglas Road	SR 16	73.5	73.58	0.08
Grant Line Road	SR 16	Sunrise Boulevard	72.03	72.41	0.38
U.S. 50	Mather Field Road	Zinfandel Drive	82.78	83.03	0.25
U.S. 50	Zinfandel Drive	Sunrise Boulevard	81.86	82.64	0.78
U.S. 50	Sunrise Boulevard	Rancho Cordova Parkway	82.31	82.31	0.00
U.S. 50	Rancho Cordova Parkway	Hazel Avenue	82.68	83.18	0.50
U.S. 50	Hazel Avenue	Folsom Boulevard	81.61	82.01	0.40
Douglas Road	Sunrise Boulevard	Jaeger Road	73.76	74.60	0.84
Douglas Road	Americanos Boulevard	Grant Line Road	71.73	72.69	0.96

Table 3.16-9 (continued)
Summary of Modeled Cumulative (Year 2030) Traffic Noise Levels

Roadway Segment	Between		Predicted Noise Level (dBA CNEL/Ldn) at 50 Feet from Near Travel Lane Centerline		
			Cumulative Without Project	Cumulative With Project	Difference
Douglas Road	Jaeger Road	Americanos Boulevard	70.85	71.88	1.03
Chrysanthy Boulevard	Sunrise Boulevard	Jaeger Road	68.29	68.87	0.58
Chrysanthy Boulevard	Jaeger Road	Americanos Boulevard	70.22	71.14	0.92
Kiefer Boulevard	Eagles Nest Road	Sunrise Boulevard	72.43	72.45	0.02
Kiefer Boulevard	Sunrise Boulevard	Jaeger Road	68.64	68.73	0.09
Eagles Nest Road	Mather Boulevard	Douglas Road	73.66	73.81	0.15
Eagles Nest Road	Douglas Road	Kiefer Boulevard	70.51	70.63	0.12
Eagles Nest Road	Kiefer Boulevard	SR 16	68.78	68.92	0.14
Sunrise Boulevard	Douglas Road	Chrysanthy Boulevard	74.96	75.98	1.02
Sunrise Boulevard	Chrysanthy Boulevard	Kiefer Boulevard	73.68	74.64	0.96
Sunrise Boulevard	Kiefer Boulevard	SR 16	74.34	74.98	0.64
Rancho Cordova Parkway	U.S. 50	Easton Valley Parkway	75.19	76.55	1.36
Rancho Cordova Parkway	Easton Valley Parkway	White Rock Road	74.33	76.29	1.96
Rancho Cordova Parkway	White Rock Road	Douglas Road	71.86	74.99	3.13
Jaeger Road	Douglas Road	Chrysanthy Boulevard	71.21	73.69	2.48
Jaeger Road	Chrysanthy Boulevard	Kiefer Boulevard	69.01	70.92	1.91
Americanos Boulevard	White Rock Road	Douglas Road	71.63	73.88	2.25
Americanos Boulevard	Douglas Road	Chrysanthy Boulevard	70.98	72.43	1.45
Excelsior Road	North of SR 16		71.04	72.29	1.25
SR 16	West of Excelsior Road		72.98	73.03	0.05

Notes: CNEL = community noise equivalent level; dBA = A-weighted decibels; EB = eastbound; FHWA = Federal Highway Administration; L_{dn} = day-night average noise level; SR = State Route; U.S. 50 = U.S. Highway 50; WB = westbound

Traffic noise levels were modeled using the FHWA Traffic Noise Prediction Model (FHWA-RD-77-108) based on traffic data obtained from the traffic analysis prepared for this project (see Section 3.14, "Traffic and Transportation"). Modeling assumes no natural or human-made shielding (e.g., vegetation, berms, walls, buildings).

Data provided by EDAW in 2006

Table 3.16-9 summarizes the CNEL/L_{dn} at 50 feet from the centerline of the near travel lane of area roadways for cumulative (year 2030) conditions, with and without buildout of the project site. Table 3.16-9 also shows the net difference in roadside noise levels for the two scenarios analyzed. Modeled roadway noise levels assume no natural or artificial shielding between the roadway and the receptor. A noticeable increase of 3 dBA (CNEL/L_{dn}) would typically occur with a doubling of roadway traffic volumes. As shown in Table 3.16-9, traffic generated by buildout of the project would contribute to the greatest increase in traffic noise along Rancho Cordova Parkway between White Rock and Douglas Roads (3.13 dBA)., This would constitute a noticeable increase in traffic noise levels (i.e., 3 dBA or greater); however, this roadway segment is located entirely on-site, and traffic along this roadway would not affect off-site sensitive receptors. Noise levels along this roadway segment are discussed below, under Impact 3.16-5. Implementation of the Proposed Project Alternative would not result in a noticeable (i.e., 3 dBA) increase in ambient noise levels along other nearby roadways.

Because future growth is expected to surround the project site with traffic-generating development by 2030, resulting in greater areawide and on-site noise levels, full buildout of development on the project site itself would not contribute to noticeable (i.e., 3 dBA or greater) increases in ambient noise levels at noise-sensitive land uses that exceed land use compatibility noise criteria. (Cumulative traffic noise impacts are discussed later in this section.) This **direct** impact is considered **less than significant**. **No indirect** impacts would occur.

HD Under the High Density Alternative, there would be a slightly higher number of trips generated on area roadways than under the Proposed Project Alternative. Noticeable increases of 3 dBA (CNEL/L_{dn}) typically occur with a doubling of roadway traffic volumes and when volumes are already high (several thousand vehicles per day). However, there would not be enough additional trips to result in noise level increases of 3 dBA, or higher under this alternative. As a result, this **direct** impact is considered **less than significant**, although it would occur at a slightly greater level than under the Proposed Project Alternative. **No indirect** impacts would occur. ***[Greater]***

IM Under the Impact Minimization Alternative, slightly fewer trips would be generated on area roadways than under the Proposed Project Alternative. Noticeable increases of 3 dBA (CNEL/L_{dn}) typically occur with a doubling of roadway traffic volumes and when volumes are already high (several thousand vehicles per day). However, there would not be enough additional trips to result in noise level increases of 3 dBA, or higher under this alternative. As a result, this **direct** impact is considered **less than significant**, and would be slightly less than under the Proposed Project Alternative. **No indirect** impacts would occur. ***[Similar]***

NF Under the No Federal Action Alternative, slightly fewer trips would be generated on area roadways than under the Proposed Project Alternative. Noticeable increases of 3 dBA (CNEL/L_{dn}) typically occur with a doubling of roadway traffic volumes and when volumes are already high (several thousand vehicles per day). However, there would not be enough additional trips to result in noise level increases of 3 dBA, or higher under this alternative. As a result, this **direct** impact is considered **less than significant**, and would be slightly less than under the Proposed Project Alternative. **No indirect** impacts would occur. ***[Similar]***

NP Under the No Project Alternative, mining activities at the project site, which are not part of the Rio del Oro project, would continue under existing Conditional Use Permits—one originally issued by the County, and the other issued by the City—and possibly under one or more future individual Implementation Permits expected to be issued by the City. As discussed in the *Aerojet Mining Amendment Mitigated Negative Declaration* (City of Rancho Cordova 2004) and the *Grantline West Mitigated Negative Declaration* (City of Rancho Cordova 2005b), each of the two mining sites is expected to employ six employees. The use of existing area roadways by these

employees would not cause a substantial increase in vehicle trips or congestion at intersections in relation to the existing traffic load, nor would it cause degradation in level of service. Although aggregate materials would be hauled off-site, the amount of truck traffic on area roadways would remain constant because the same number of trucks from other mining sites would be rerouted for use at the new Grantline West site. Existing trucks currently being used at the Aerojet mining site would continue to be used for additional mining activities at that location.

Because no new traffic would be generated under the No Project Alternative, traffic noise levels on area roadways would not increase; thus, **no direct** or **indirect** impacts would occur. ***[Lesser]***

Mitigation Measure: No mitigation measures are required.

IMPACT 3.16-5

Compatibility of Proposed Land Uses with Projected Noise Levels. *Noise levels could exceed the City's applicable land-use compatibility noise standards at proposed noise-sensitive land uses located close to airport, roadway, and mining noise sources.*

PP

Noise levels within the project site are influenced largely by aircraft associated with Mather Airport and vehicle traffic on area roadways. Predicted noise contours associated with Mather Airport are presented in Exhibits 3.16-2 and 3.16-3. The compatibility of proposed land uses with respect to aircraft, vehicle traffic, and mining noise under the Proposed Project Alternative is discussed below.

Mather Airport

Noise that emanates away from airports and airplane flight paths is typically represented by concentric noise contours around the airport. The contours delineate zones where land use is restricted, protecting the citizens on the ground from the detrimental effects of exposure to excessive aircraft noise. The contours are constructed using noise samples from around the airport, combined with specific computer noise models that indicate the location of each contour line. The contours are developed taking into account the number, time of day, and frequency of aircraft operations, as well as variations in monthly and seasonal flight schedules. The result is a 24-hour day/night average noise contour, depicted in CNEL, that is used to assist in the determination of compatible land uses around the airport.

The currently adopted CNEL noise contours, obtained from the ALUCP for Mather Airport, are depicted in Exhibit 3.16-2. These noise contours, however, have recently been proposed for revision as part of the development of the *Mather Airport Master Plan*, which is currently being prepared by the Sacramento County Airport System. The noise contours were revised to account for changes in aircraft operations that have occurred since development of the ALUCP for Mather Airport, or that are projected to occur. The proposed CNEL noise contours for Mather Airport, in relationship to the project site and proposed land uses, are presented in Exhibit 3.16-3. The predicted noise contours do not take into account shielding or reflection of noise by existing structures. As a result, the noise contours should be considered to represent bands of similar noise exposure, rather than absolute lines of demarcation. Actual noise levels will vary from day to day depending on a number of factors, including traffic volumes, shielding by existing structures, variations in attenuation rates because of changes in surface parameters, and meteorological conditions.

Proposed noise-sensitive land uses would not be located within the 60-dBA CNEL contour shown in the revised Mather Airport noise-contour map (Exhibit 3.16-3); thus, they would be considered compatible with these updated contours. However, some proposed noise-sensitive land uses would be located within the 60-dBA CNEL contour shown in the noise-contour map

for the currently adopted ALUCP for Mather Airport (Exhibit 3.16-2). Because the updated Mather Airport noise contours have yet to be adopted by the ALUC, this **direct** impact is considered **significant**. However, this impact conclusion would change should the ALUCP be revised to incorporate the revised Mather Airport noise contours currently being developed as part of the *Mather Airport Master Plan* (Exhibit 3.16-3). **No indirect** impacts would result.

Mining Activities

Aggregate mining and reclamation of certain portions of the project site will occur over a period of several years, and will involve the excavation and relocation or removal of portions of the existing deposits of dredge tailings. Mining activities are separate actions from the project, and will take place under existing Conditional Use Permits—one originally issued by the County, and the other issued by the City—and possibly under one or more individual Implementation Permits expected to be issued by the City. To date, two mining permits have been approved for areas in the eastern and western portion of the project site. Noise impacts associated with mining were evaluated as part of the *Aerojet Mining Amendment Mitigated Negative Declaration* (City of Rancho Cordova 2004) and the *Grantline West Mitigated Negative Declaration* (City of Rancho Cordova 2005b). According to these documents, on-site mining activities would be limited to daytime hours and are anticipated to occur in stages over a period of several years. Mining equipment is anticipated to include front-end loaders, aggregate screens, and conveyor belts. The average noise levels of mining activities (without shielding) were measured at approximately 73 dBA at 150 feet (City of Rancho Cordova 2004). Based on this noise level and assuming an average attenuation rate of 6 dBA per doubling of distance from the source, areas within approximately 1,100 feet of mining activities could exceed the City's daytime noise standard of 55 dBA.

Depending on the location of on-site mining activities in relation to future development of project-generated on-site land uses, mining could generate noise levels that would exceed the City's maximum allowable daytime noise standards at nearby receptors. This is considered a **potentially significant, direct** impact. **No indirect** impacts would occur.

Roadway Traffic Noise Levels

Predicted traffic noise levels within the project site were calculated using the FHWA Noise Prediction Model (FHWA-RD-77-108) based on traffic information (i.e., average daily traffic, vehicle speeds, roadway width) obtained from the traffic analysis prepared for this project (see Section 3.14, "Transportation and Traffic"). Input data used in the model included average daily traffic levels for nearby area roadways (Table 3.16-9), day/night percentages of autos, medium and heavy trucks, vehicle speeds, ground attenuation factors, and roadway widths. Traffic noise levels were calculated for future cumulative conditions at buildout (year 2030) with and without buildout of the project; these noise levels are summarized in Table 3.16-9.

The 60-dBA CNEL noise contours for adjacent roadways (i.e., Sunrise Boulevard, Douglas Road, and White Rock Road) and on-site proposed roadways (i.e., Rancho Cordova Parkway and Americanos Boulevard) extend onto portions of the project site, including areas of proposed single-family and multifamily residential development (see Table 3.16-9). Predicted on-site noise levels at residential dwellings located within these projected noise contours could potentially exceed the City's land-use compatibility standard of 60 dBA CNEL. In addition, predicted traffic noise levels at the proposed high school/middle school located east of the proposed Rancho Cordova Parkway and north of the proposed Rio del Oro Parkway would likewise exceed the acceptable land-use compatibility standard of 60 dBA CNEL. Thus, on-site noise levels at residential dwellings within the 60-dBA CNEL noise contours for adjacent roadways would be considered a **significant** impact.

In summary, based on the transportation noise analyses conducted for the Proposed Project Alternative, predicted on-site noise levels from area roadways would exceed the City's applicable land-use compatibility noise standards at proposed noise-sensitive land uses. In addition, noise from Mather Airport and mining activities could also exceed the City's applicable land-use compatibility noise standards at proposed noise-sensitive land uses. Consequently, this impact is considered **significant**. Both **direct** and **indirect** impacts would occur.

HD Under the High Density Alternative, there would be more sensitive receptors on-site and a slightly higher number of trips would be generated on area roadways than under the Proposed Project Alternative. On-site roadway traffic noise levels would be slightly higher than under the Proposed Project Alternative, and 60-dBA noise contours would extend farther into sensitive land uses. Land use compatibility with respect to noise levels from Mather Airport and mining activities would be the same as under the Proposed Project Alternative. This impact is considered **significant**. Both **direct** and **indirect** impacts would occur. ***[Greater]***

IM Under the Impact Minimization Alternative, there would be fewer receptors on-site and fewer trips would be generated on area roadways than under the Proposed Project Alternative. Thus, on-site roadway traffic noise levels would be less than those under the Proposed Project Alternative. Land use compatibility with respect to noise levels from Mather Airport and mining activities would be the same as under the Proposed Project Alternative. This impact is considered **significant** and would result in both **direct** and **indirect** impacts. ***[Lesser]***

NF Under the No Federal Action Alternative, there would be fewer receptors on-site and fewer trips would be generated on area roadways than under the Proposed Project Alternative. Thus, on-site roadway traffic noise levels would be less than those under the Proposed Project Alternative. Land use compatibility with respect to noise levels from Mather Airport and mining activities would be the same as under the Proposed Project Alternative. This impact is considered **significant** and would result in both **direct** and **indirect** impacts. ***[Lesser]***

NP Under the No Project Alternative, mining activities at the project site, which are not part of the Rio del Oro project, would continue under existing Conditional Use Permits—one originally issued by the County, and the other issued by the City—and possibly under one or more future individual Implementation Permits expected to be issued by the City. Mining activities would not generate any sensitive receptors.

Because no new project-related sensitive receptors would be generated under the No Project Alternative, no sensitive receptors would be exposed to noise generated from the airport, roadways, or mining activities; thus, **no direct** or **indirect** impacts would result. ***[Lesser]***

Mitigation Measure 3.16-5: Implement Measures to Improve Land Use Compatibility with Noise Sources.

PP, HD, IM, NF To meet City noise standards set forth in the City General Plan and Noise Ordinance and improve compatibility between project land uses and noise sources, the project applicant(s) for all project phases shall implement the following for all project phases:

- Implement Mitigation Measure 3.16-2 described above.
- Obtain the services of a consultant (such as a licensed engineer or licensed architect) to develop noise attenuation measures for the proposed construction of on-site noise-sensitive land uses (i.e., residential dwellings and school classrooms) that will produce a minimum composite Sound Transmission Class (STC) rating for buildings of 30 or greater, individually computed for the walls and the floor/ceiling construction of buildings, for the proposed construction of on-site noise-sensitive land uses (i.e., residential dwellings and school

classrooms).

- When tentative subdivision maps and commercial uses are proposed, the project applicant(s) shall conduct a site-specific acoustical analysis to determine predicted roadway noise impacts attributable to the project, taking into account site-specific conditions (e.g., site design, location of structures, building characteristics). The acoustical analysis shall evaluate stationary- and mobile-source noise attributable to the proposed use or uses and impacts on nearby noise-sensitive land uses, in accordance with adopted City noise standards. Feasible measures shall be identified to reduce project-related noise impacts. Measures may include, but are not limited to, the following:

  - construction of exterior sound walls;

  - use of increased noise-attenuation measures in building construction (e.g., dual-pane, sound-rated windows; exterior wall insulation); and

  - limiting noise-generating operational activities associated with proposed commercial land uses, including truck deliveries.

In addition, to reduce impacts associated with noise generated during ongoing mining activities, the project applicant(s) for all project phases shall implement the following measures where mining activities would be located within 1,100 feet of occupied noise-sensitive daytime land uses (e.g., school classrooms, childcare and convalescent care facilities, inpatient medical facilities):

- Written notification of mining activities shall be provided to noise-sensitive receptors located within 1,100 feet of mining activities. Notification shall include anticipated hours during which mining activities are anticipated to occur and contact information, including a daytime telephone number, for the project representative to be contacted if noise levels are deemed excessive. The notification shall also include recommendations to assist noise-sensitive land uses in reducing interior noise levels (e.g., closing windows and doors).

- Occupied noise-sensitive receptors shall not be located within 1,100 feet of mining equipment/activities unless a temporary barrier is constructed in accordance with the following specifications:

  - The barrier shall be placed as close to the noise source or as close to the receptor as possible and shall break the line of sight between the source and receptor.

  - The barrier shall be constructed of three-quarter-inch Medium Density Overlay (MDO) plywood sheeting, or other acceptable material that has a surface weight of 2 pounds per square foot (lb/sf) or greater and a demonstrated STC rating of 25 or greater, as defined by American Society for Testing and Materials (ASTM) Test Method E90.

  - If a temporary acoustical curtain is used, the material shall be weather and abuse resistant and shall exhibit superior hanging and tear strength during construction, with a surface weight of at least 1 lb/sf. The material shall have a minimum breaking strength of 120 pounds per inch (lb/in) per Federal Test Method Standard (FTMS) 191 A-M5102 and a minimum tear strength of 30 lb/in per ASTM D117. Based on the same test procedures, the absorptive material facing shall have a minimum breaking strength of 100 lb/in and a minimum tear strength of 7 lb/in. The material shall have an STC rating of 25 or greater, based on certified sound transmission loss data taken according to ASTM Test Method E90. It shall also have a Noise Reduction Coefficient rating of 0.70 or greater, based on

certified sound absorption coefficient data according to ASTM Test Method C423.

- When barrier units are joined together, the mating surfaces of the barrier sides shall be flush with each other. Gaps between barrier units, and between the bottom edge of the barrier panels and the ground, shall be closed with material that will completely close the gaps, and be dense enough to attenuate noise.

Furthermore, to reduce impacts associated with aircraft noise, the project applicant(s) for all project phases shall implement the following measures:

- Ensure that aviation easements are prepared before completion of final maps, and submitted with the final maps to the Department of Airports. Such aviation easements shall acknowledge the property's location within the MAPA and shall grant the right of flight and unobstructed passage of all aircraft into and out of Mather Airport.

- Provide notification in a public report, to be prepared by the California Department of Real Estate, disclosing to prospective buyers that parcels to be purchased are located within the MAPA and that an aviation easement exists for aircraft into and out of Mather Airport. Revise relevant portions of project land use plans to be compatible with the existing noise contours if the proposed Mather Airport noise contours are not adopted.

Timing: Before the recordation of final maps and during all project construction activities for all project phases where applicable.

Enforcement: City of Rancho Cordova Planning Department.

NP No mitigation measures are required.

Implementation of Mitigation Measure 3.16-5 would likely be effective in reducing interior noise levels of new development to less-than-significant levels under the Proposed Project, High Density, Impact Minimization, and No Federal Action Alternatives. However, exterior noise levels related to roadway traffic and mining activities would be anticipated to exceed applicable land-use compatibility noise standards. Because no feasible mitigation measures are available to reduce all exterior noise levels to be compatible with City noise standards, this impact would remain **significant and unavoidable.** The Mather noise contours are not triggering this conclusion. Impacts from mining activities and area roadways are unavoidable and attenuation measures are infeasible.

IMPACT 3.16-6

Potential Exposure to Single-Event Aircraft Noise Levels Exceeding Applicable Standards. *Project implementation could result in exposure of proposed sensitive receptors to single-event aircraft noise levels in excess of applicable standards.*

PP, HD, IM, NF Noise intrusion from aircraft operations is often perceived as more disturbing than noise from other sources, such as traffic on area roadways, because of its sporadic nature and high noise levels. The noise produced by aircraft also varies over a wide frequency range, generating audible low-frequency (experienced as a rumble or vibration) and high-frequency noise. Low-frequency noise (below 500 Hz) penetrates walls, roofs, doors, and windows more effectively than high-frequency noise. Higher frequencies (above 1,000 Hz) transmit better through cracks, ducts, and vents. Most of the sound energy from aircraft operations is found at lower frequencies, which can also cause structural vibrations in dwellings and increased levels of annoyance, particularly during the more noise-sensitive evening and nighttime hours. Impact 3.16-5 above analyzes the land use compatibility of the proposed uses with aircraft operations with respect to the Mather Airport CNEL noise contours. Such contours, which represent a 24-hour average noise level, include single events. Impact 3.16-6 specifically addresses the single-event impact.

There are currently no federal or state standards or criteria for the evaluation and planning of land uses with relation to single-event aircraft noise. Research conducted on single-event aircraft noise has focused primarily on specific human reactions such as speech interference and sleep disturbance. Research conducted by EPA and the Federal Aviation Administration (FAA) has suggested that the threshold of speech interference is 60 dBA. From a technical perspective, whenever intrusive noise exceeds approximately 60 dBA indoors, there will be interference with speech communication. This interference may result from masking of the speaker's words or by causing the speaker to pause. Increasing the indoor level of intrusive noise to 80 dBA reduces intelligibility to near zero, even if a loud voice is used. Based on the average levels of noise reduction (attenuation) provided by typical residential construction (15 dBA with windows open and 20 dBA with windows closed), some degree of indoor speech interference would be expected whenever exterior noise levels exceed 80 dBA with windows open or 90 dBA with windows closed. School classrooms that demand a quiet background are of particular concern. The degradation of speech communication within a classroom may affect the learning process (FICON 1992).

For sleep disruption, the threshold of significance is less absolute because there is more variability from one person to another. Results of several studies (Caltrans 2002) indicated that 10% of the study population was awakened at 80 dBA SEL.

Based on the ambient noise monitoring conducted for this project in 2005, intermittent noise levels associated with aircraft overflight of the project site vary depending on various factors, including type of aircraft, flight path, meteorological conditions, and altitude.

Intermittent aircraft noise levels documented during the ambient noise surveys conducted for this project are summarized in Table 3.16-10. Measurements were conducted along the western boundary of the project site, beneath the Mather Airport flight path. As indicated, SELs from aircraft overflight of the project site range from approximately 65 to 96 dBA L_{max} and from approximately 71 to 102 dBA SEL. It should be noted that these measurements are based on a limited number of aircraft overflights and that actual noise levels may vary. Nonetheless, assuming a maximum noise level of 102 dBA SEL and an average exterior-to-interior noise reduction of 20 dBA, predicted maximum interior noise levels could reach 82 dBA. Interior

Table 3.16-10
Summary of Measurements of Single-Event Aircraft Noise

Aircraft Type	Altitude (Feet)	Speed (knots) [a]	Number of Operations	Noise Level (dBA) [b]	
				L_{max}	SEL
Propeller/turboprop	702–764	76–109	4	65–73	71–79
Helicopter	807	86	1	72	80
Commercial jet	682–794	101–157	4	78–79	86–88
Military jet	515–768	167–202	3	80–96	87–102

Notes: dBA = A-weighted decibels; Lmax = maximum sound level recorded for each event; SEL = sound exposure level

a Aircraft altitude and speed are approximate, based on interpretation of flight track data obtained from the Sacramento County Airport System in 2005.

b Measurements performed February 23, 2005, using a Larson Davis 820 integrating sound level meter positioned at a height of 5 feet above ground level. Measurements were conducted at the western property line of the project site, below the approach flight path for instrument landing systems. The single-event noise meter threshold was set to approximately 10 dBA above background noise levels.

Sources: Data provided by AMBIENT Air Quality & Noise Consulting in 2005; SCAS 2005

noise levels would exceed the commonly applied thresholds of 60 dBA for speech interference and 80 dBA for sleep disruption. Mather Airport operates 24 hours per day; therefore, single-event aircraft noise can occur at any time during the day or night. Consequently, exposure to single-event aircraft noise would be considered a **direct**, **significant** impact. **No indirect** impacts would occur. ***[Similar]***

NP Under the No Project Alternative, mining activities at the project site, which are not part of the Rio del Oro project, would continue under existing Conditional Use Permits—one originally issued by the County, and the other issued by the City—and possibly under one or more future individual Implementation Permits expected to be issued by the City. Although the mining sites are within 2 miles of Mather Airport, they are not within the area covered by the ALUCP for Mather Airport, and noise levels from mining activities would have no effect on Mather Airport safety or operations.

Because there would be no new sensitive receptors under the No Project Alternative, no sensitive receptors would be exposed to single-event aircraft noise; thus, **no direct** or **indirect** impacts would occur. ***[Lesser]***

Mitigation Measure: Implement Applicable Portions of Mitigation Measure 3.16-5.

Implementation of the aviation easement and public notification are recommended by the County to ensure that occupants of new land uses within airport planning areas are aware of potential aircraft noise impacts. Implementation of the acoustical analysis and associated mitigation measures would help to reduce sound intrusion into noise-sensitive buildings (i.e., residential dwellings, classrooms), including single-event noise from aircraft. An acoustically well-insulated building with windows and doors kept closed can provide 30 dB of noise attenuation, whereas more typical unmodified buildings might provide 20–25 dB of noise-level reduction. Providing more than 40 dB of noise-level reduction is not usually practical for a typical building (Wyle Laboratories 1994).

Thus, implementation of Mitigation Measure 3.16-5 would be effective in reducing interior noise levels of new development under the Proposed Project, High Density, Impact Minimization, and No Federal Action Alternatives; however, no feasible mitigation measures are available to reduce impacts to a less-than-significant level. This impact would remain **significant and unavoidable**.

Project Level (Phase 1) Impacts and Mitigation Measures

IMPACT 3.16-7

Temporary Exposure to Construction-Generated Noise. *Construction activities for development Phase 1 could temporarily exceed applicable standards at nearby noise-sensitive receptors.*

Impacts would be the same under Phase 1 as under the program (entire project site) level analysis for all alternatives. Refer to Impact 3.16-1 for further discussion of this impact.

With implementation of Mitigation Measure 3.16-1, construction would be limited to daytime hours, for which associated noise levels are considered exempt from the provisions of the City Noise Ordinance, and equipment would be properly maintained, sound barriers installed, and setbacks established, resulting in levels below the City's noise standards. Therefore, implementation of this mitigation measure would reduce potentially significant impacts from temporary construction noise under the Proposed Project, High Density, Impact Minimization, and No Federal Action Alternatives to a **less-than-significant** level.

IMPACT 3.16-8

Potential Exposure to Stationary-Source Noise Generated by On-site Land Uses. *Implementation of development Phase 1 could result in potential exposure of sensitive receptors to noise levels from on-site stationary sources in excess of applicable standards.*

Impacts would be the same under Phase 1 as under the program (entire project site) level analysis for all alternatives. Refer to Impact 3.16-3 for further discussion of this impact.

Compliance with the City Noise Ordinance and implementation of additional mitigation measures for the control of stationary-source noise, such as those identified above in Mitigation Measure 3.16-2, would reduce stationary-source noise levels under the Proposed Project, High Density, Impact Minimization, and No Federal Action Alternatives. However, stationary-source noise levels from activities on land uses over which the City has limited control could still result in noise levels at nearby sensitive receptors that exceed the City's maximum allowable noise standards. Therefore, this impact would remain **significant and unavoidable.**

IMPACT 3.16-9

Potential Exposure to Off-site Stationary-Source Noise. *Implementation of development Phase 1 could result in potential exposure of proposed sensitive receptors to noise levels from off-site stationary sources in excess of applicable standards.*

Impacts would be the same under development Phase 1 as under the program (entire project site) level analysis for all alternatives. Refer to Impact 3.16-2 for further discussion of this impact.

Compliance with the City Noise Ordinance and implementation of any additional mitigation measures for the control of stationary-source noise, such as those identified above in Mitigation Measure 3.16-2, would reduce stationary-source noise impacts under the Proposed Project, High Density, Impact Minimization, and No Federal Action Alternatives. Implementation of Mitigation Measure 3.16-2 would reduce interior noise levels to a less-than-significant level. However, exterior noise levels could still exceed applicable land-use compatibility noise standards. No additional feasible mitigation measures are available to further reduce exterior noise levels; therefore, this impact remains **significant and unavoidable.**

IMPACT 3.16-10

Project-Generated Increases in Traffic Noise Levels on Area Roadways. *Implementation of development Phase 1 would introduce new traffic to area roadways, resulting in an associated increase in traffic noise levels.*

PP

The increase in daily traffic volumes resulting from implementation of the Proposed Project Alternative would generate increased noise levels along nearby roadway segments. The FHWA Traffic Noise Prediction Model (FHWA 1988) was used to calculate traffic noise levels along affected roadways for baseline traffic conditions, with and without implementation of the Proposed Project Alternative (Table 3.16-11), based on the trip distribution estimates obtained from the traffic analysis prepared for this project (see Section 3.14, "Traffic and Transportation"). The project's contribution to the existing traffic noise levels along area roadways was determined by comparing the predicted noise levels with and without project-generated traffic.

Table 3.16-11 summarizes the CNEL/L_{dn} at 50 feet from the centerline of the near travel lane of area roadways for baseline conditions, with and without buildout of development Phase 1. Table 3.16-11 also shows the net difference in roadside noise levels for the two scenarios analyzed. Modeled roadway noise levels assume no natural or artificial shielding between the roadway and the receptor. As shown, traffic generated by development Phase 1 would result in a noticeable increase in traffic noise (i.e., 3 dBA or greater) along White Rock Road between Sunrise Boulevard and Grant Line Road (3.14 dBA). However, developed land uses located along this

Table 3.16-11
Summary of Modeled Baseline (Year 2014) Traffic Noise Levels

Roadway Segment	Between		Predicted Noise Level (dBA CNEL/L_{dn}) at 50 Feet from Near Travel Lane Centerline		
			Baseline Without Project	Baseline Plus Phase 1	Difference
SR 16	Excelsior Road	Eagles Nest Road	72.82	72.89	0.07
SR 16	Sunrise Boulevard	Grant Line Road	74.03	74.37	0.34
Kiefer Boulevard	Grant Line Road	North of SR 16	62.80	63.02	0.22
Mather Boulevard	Femoyer Street	Douglas Road	72.42	72.68	0.26
Douglas Road	Mather Boulevard	Sunrise Boulevard	74.59	75.47	0.88
International Drive	South White Rock Road	Zinfandel Drive	70.30	71.06	0.76
International Drive	Zinfandel Drive	Kilgore Road	68.43	69.76	1.33
White Rock Road	Zinfandel Drive	Sunrise Boulevard	71.78	73.92	2.14
White Rock Road	Sunrise Boulevard	Grant Line Road	71.13	74.27	3.14
Folsom Boulevard	Zinfandel Drive	Sunrise Boulevard	72.01	72.18	0.17
Folsom Boulevard	Sunrise Boulevard	Hazel Avenue	73.23	73.39	0.16
Mather Field Road	Folsom Boulevard	U.S. 50 WB ramps	73.25	73.31	0.06
Mather Field Road	U.S. 50 EB ramps	International Drive	74.25	74.34	0.09
Zinfandel Drive	Folsom Boulevard	U.S. 50 WB ramps	72.81	73.17	0.36
Zinfandel Drive	U.S. 50 EB ramps	White Rock Road	75.03	76.09	1.06
Zinfandel Drive	White Rock Road	International Drive	71.74	71.74	0.00
Sunrise Boulevard	Gold Country Boulevard	Coloma Road	77.03	77.53	0.50
Sunrise Boulevard	Coloma Road	U.S. 50 WB ramps	77.42	77.97	0.55
Sunrise Boulevard	U.S. 50 EB ramps	Folsom Boulevard	75.81	76.94	1.13
Sunrise Boulevard	Folsom Boulevard	White Rock Road	75.07	76.52	1.45
Sunrise Boulevard	White Rock Road	Douglas Road	75.75	77.49	1.74
Sunrise Boulevard	SR 16	Grant Line Road	71.77	72.98	1.21
Hazel Avenue	Winding Way	U.S. 50 WB ramps	76.2	76.37	0.17
Grant Line Road	White Rock Road	Douglas Road	71.48	71.77	0.29
Grant Line Road	Douglas Road	SR 16	70.50	70.56	0.06
Grant Line Road	SR 16	Sunrise Boulevard	69.84	69.84	0.00
U.S. 50	Mather Field Road	Zinfandel Drive	82.64	82.91	0.27
U.S. 50	Zinfandel Drive	Sunrise Boulevard	82.09	82.09	0.00
U.S. 50	Sunrise Boulevard	Hazel Avenue	81.75	81.96	0.21
U.S. 50	Hazel Avenue	Folsom Boulevard	81.19	81.31	0.12
Douglas Road	Sunrise Boulevard	Jaeger Road	74.22	75.15	0.93
Douglas Road	Americanos Boulevard	Grant Line Road	69.55	70.12	0.57
Sunrise Boulevard	Douglas Road	Kiefer Boulevard	72.92	74.38	1.46
Sunrise Boulevard	Kiefer Boulevard	SR 16	72.57	73.75	1.18
Excelsior Road	North of SR 16		68.42	68.98	0.56
SR 16	West of Excelsior Road		72.82	72.96	0.07

Notes: CNEL = community noise equivalent level; dBA = A-weighted decibels; EB = eastbound; FHWA = Federal Highway Administration; L_{dn} = day-night average noise level; SR = State Route; U.S. 50 = U.S. Highway 50; WB = westbound

Traffic noise levels were modeled using the FHWA Traffic Noise Prediction Model (FHWA-RD-77-108) based on traffic data obtained from the traffic analysis prepared for this project (see Section 3.14, Traffic and Transportation"). Modeling assumes no natural or human-made shielding (e.g., vegetation, berms, walls, buildings).

Data provided by EDAW in 2005

roadway segment consist of industrial, office, and commercial land uses. No noise-sensitive land uses (such as schools or residential dwellings) are located along this roadway segment. In addition, implementation of development Phase 1 would not result in a noticeable (i.e., 3 dBA) increase in ambient noise levels along other nearby roadways. Consequently, implementation of development Phase 1 would not contribute to noticeable increases in ambient noise levels at noise-sensitive land uses that would exceed land-use compatibility noise criteria. (Cumulative traffic noise impacts are discussed later in this section.) This **direct** impact is considered **less than significant**. **No indirect** impacts would occur.

HD, IM, NF, NP — Impacts would be the same under Phase 1 as under the program (entire project site) level analysis for these alternatives. Refer to Impact 3.16-4 for further discussion of these impacts.

Mitigation Measures: No mitigation measures are required.

IMPACT 3.16-11 — Compatibility of Proposed Land Uses with Projected Noise Levels. *Under development Phase 1, noise levels could exceed the City's applicable land-use compatibility noise standards at proposed noise-sensitive land uses located close to airport, roadway, and mining noise sources.*

Impacts would be the same under Phase 1 as under the program (entire project site) level analysis for all alternatives. Refer to Impact 3.16-5 for further discussion of this impact.

Implementation of Mitigation Measure 3.16-5 would likely be effective in reducing interior noise levels of new development to less-than-significant levels under the Proposed Project, High Density, Impact Minimization, and No Federal Action Alternatives. However, exterior noise levels related to roadway traffic and mining activities would be anticipated to exceed applicable land-use compatibility noise standards. Because no feasible mitigation measures are available to reduce all exterior noise levels to be compatible with City noise standards, this impact would remain **significant and unavoidable.** The Mather noise contours are not triggering this conclusion. Impacts from mining activities and area roadways are unavoidable and attenuation measures are infeasible.

IMPACT 3.16-12 — Potential Exposure to Single-Event Aircraft Noise Levels Exceeding Applicable Standards. *Implementation of development Phase 1 could result in exposure of proposed sensitive receptors to single-event aircraft noise levels in excess of applicable standards.*

Impacts would be the same under Phase 1 as under the program (entire project site) level analysis for all alternatives. Refer to Impact 3.16-6 for further discussion of this impact.

For the reasons described above for Impact 3.16-6, implementation of Mitigation Measure 3.16-6 would be effective in reducing interior noise levels of new development under the Proposed Project, High Density, Impact Minimization, and No Federal Action Alternatives; however, no feasible mitigation measures are available to reduce impacts to a less-than-significant level. This impact would remain **significant and unavoidable**.

CUMULATIVE IMPACTS

Project implementation would result in significant noise impacts associated with construction activities; noise generated by on-site land uses (residential and commercial uses, schools, and parks); and noise generated by existing sources such as nearby roadways, the Cordova Shooting Center, and Mather Airport. Noise impacts from construction activities and on-site land uses could be reduced to less-than-significant levels with implementation of Mitigation Measure 3.16-1; however, noise impacts from on-site land uses would remain significant and unavoidable with implementation of Mitigation Measure 3.16-2 because stationary-source noise levels from activities on land uses over which the City has limited control could still result in noise levels at nearby sensitive receptors that exceed the City's maximum allowable noise standards. Implementation of Mitigation Measures 3.16-3

through 3.16-6 would reduce potentially significant and significant interior-noise impacts, but exterior noise levels would remain significant and unavoidable because no feasible mitigation is available to reduce the impact.

Noise is a localized occurrence and attenuates rapidly with distance. Therefore, only future cumulative development projects in the direct vicinity of the project site would have the potential to add to anticipated project-generated stationary-source noise, thus resulting in cumulative noise impacts. Proposed development within the Sunrise Douglas Specific Plan area and the Grantline West planning area would generate types of noise similar to those of the Rio del Oro project, and like the project, development within both planning areas would have the potential to affect nearby residences and other sensitive receptors.

Stationary-source noise associated with the Rio del Oro project and the related projects could potentially result in exceedance of the City's noise regulations at sensitive receptors. The noise from any stationary noise sources associated with the related projects could be controlled at the source (by means of noise walls, enclosures, site planning, and so on), but there is no guarantee that all the related projects would include such noise controls as part of their proposals. Therefore, significant cumulative noise impacts associated with stationary noise sources could occur. Projects along Douglas Road within the Sunrise Douglas Specific Plan area, and proposed development in the Grantline West planning area, are close enough to the Rio del Oro project site to have an additive effect from stationary noise sources. As mentioned above, implementation of Mitigation Measure 3.16-2 would reduce project-generated stationary-source noise impacts, but not to a less-than-significant level; thus, project implementation would result in a cumulatively considerable incremental contribution to significant cumulative stationary-source noise impacts.

The City's noise regulations limit construction activities to daytime hours. However, for the Rio del Oro project, it was determined that adherence to these noise regulations alone would not be sufficient to avoid significant construction-noise impacts on sensitive receptors (i.e., schools, convalescent care and daycare facilities, and places of worship). It is similarly anticipated that compliance with these regulations alone would not avoid significant construction-noise impacts associated with the related projects. Therefore, significant cumulative noise impacts associated with construction activities could occur. Projects along Douglas Road within the Sunrise Douglas Specific Plan area and proposed development in the Grantline West planning area are close enough to the Rio del Oro project site to have an additive effect from construction-noise sources. However, implementation of Mitigation Measure 3.16-1 would reduce project-related construction-noise impacts to a less-than-significant level. Coupled with the fact that noise diminishes with distance, project construction would not result in a cumulatively considerable incremental contribution to any significant cumulative noise impacts.

Construction noise and stationary-source noise can be controlled on-site at the point of origin; however, traffic noise may extend beyond a project site along existing and proposed off-site and on-site roadways, resulting in significant traffic noise impacts on sensitive uses along these roadways. Because full buildout of the Rio del Oro project would result in a perceptible increase in traffic noise on several roadways, the project would incrementally contribute to a cumulative impact. Furthermore, the combined cumulative increase in traffic on area roadways would extend the 60-dBA noise contour distances for these roadway segments, causing additional proposed sensitive receptors to fall within this contour. Thus, the traffic noise impacts from Rio del Oro and the related projects, taken together, are considered cumulatively significant. Construction of sound walls and other noise-attenuating features (e.g., berms) throughout the area would require a citywide program and may not be feasible to implement. Because it is considered infeasible to sufficiently reduce noise at every existing and proposed sensitive receptor that would be affected, this cumulative traffic noise impact is considered significant and unavoidable. The project's incremental contribution to the significant cumulative impact is itself considered cumulatively considerable, and thus significant and unavoidable.

Noise impacts related to airport land uses are limited to a specific distance around the individual airport, depending on flight patterns. Because these impacts are localized, they would not result in cumulative, additive effects.

3.16.4 RESIDUAL SIGNIFICANT IMPACTS

Residual significant exterior noise impacts would remain from the increase in project-generated traffic; the increase in cumulative traffic noise on area roadways as a result of full project buildout; and exposure of sensitive project-generated land uses to single-event aircraft noise generated by Mather Airport and concurrent mining activities. Because no feasible mitigation is available to reduce these impacts to a less-than-significant level, the impacts would remain significant and unavoidable. Additionally, noise from activities on land or from land uses over which the City has limited control could still result in stationary-source noise levels at nearby sensitive receptors that exceed the City's maximum allowable noise standards. Therefore, this impact would remain significant and unavoidable.