## 3.1.5 Noise and Vibration

### 3.1.5.1 Affected Environment

#### Noise Characteristics and Measurement

Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air. Noise can be defined as unwanted sound. Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency), speed of propagation, and pressure level or energy content (amplitude). In particular, the sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level. The decibel (dB) scale is used to quantify sound intensity. Because sound pressure can vary by over one trillion times within the range of human hearing, a logarithmic loudness scale is used to keep sound intensity numbers at a convenient and manageable level. Because the human ear is not equally sensitive to all frequencies within the entire spectrum, noise measurements are weighted more heavily within those frequencies of maximum human sensitivity in a process called "A-weighting," written as dBA. Finally, human hearing can detect changes in sound levels of approximately 3 dBA under quiet conditions. Changes of less than 3 dBA are discernible only under controlled, extremely quiet conditions.

Time variation in noise exposure is typically expressed in terms of a steady-state, average energy level called Leq or, alternately, as a statistical description of the sound level that is exceeded over some fraction of a given observation period. Because community receptors are more sensitive to unwanted noise intrusion during the evening and at night, state law requires that, for planning purposes, an artificial dB increment be added to quiet-time noise levels in a 24-hour noise descriptor called the community noise equivalent level (CNEL) or day-night noise level (Ldn). The CNEL descriptor requires that an artificial increment of 5 dBA be added to the actual noise level for the hours from 7:00 to 10:00 p.m. and 10 dBA for the hours from 10:00 p.m. to 7:00 a.m. The Ldn descriptor uses the same methodology, except no artificial increment is added to the hours between 7:00 and 10:00 p.m. Both descriptors give roughly the same 24-hour level, with the CNEL being only slightly more restrictive. The County's General Plan allows the use of either descriptor.

Sound pressure decreases in intensity as distance from the noise source increases. This phenomenon is known as atmospheric attenuation and is commonly referred to as sound attenuation with distance. Attenuation factors commonly used in noise analyses vary from between 3 to 6 decibels for each doubling of the distance from the noise source. For "line source" noises, such as those associated with a roadway or rail line, noise attenuation is assumed to be about 4.5 dB for each doubling of distance from the noise source. This level of attenuation for line sources is appropriate where noise is propagated over a soft surface such as ground that has a vegetative cover. For a "point source" of noise, such as the operation of construction machinery or aggregate processing equipment at the site, an attenuation factor of 6 dB for each doubling of distance from the source is assumed. This assumption is also based on noise propagated over relatively flat terrain with no intervening barriers. For distances more than 1,000 feet from a noise source, additional attenuation can occur from atmospheric absorption, wind direction and speed, changes in temperature and humidity, and elevation. However, this additional attenuation is very difficult to predict.

**Characteristics and Measurement of Vibration Due to Blasting**

Blasting is often performed in aggregate mines as the only practical method to fracture and loosen rock that is too hard or consolidated to excavate with conventional mechanical equipment. The effects and characteristics of such blasting have been studied by various researchers and governmental agencies, and standards have been established to limit the effects that blasting may have on surrounding areas. These standards, which are identified below, consider factors related to damage potential and those related to human perception and response.

The three main effects that potentially result from blasting include ground vibration, air overpressure (or airblast), and flyrock (rock flying away from the blast). The Department of the Interior, Office of Surface Mining Reclamation and Enforcement (OSMRE), addresses these aspects in its regulations implementing the Federal Surface Mining Control and Reclamation Act of 1977, Pub. L. 95-87 (30 U.S.C. §§1201 et seq.), found in 30 CFR, Chapter VII. Ground vibration and airblast are discussed below.

**Ground Vibration**

The commonly measured physical effects of blasting relating to ground vibration are particle displacement, velocity, and acceleration. Of these, particle velocity, measured in inches per second (in/sec), has been shown to be the most closely correlated to damage in the frequency range of typical blasting vibrations. OSMRE regulations stipulate that the maximum ground vibration due to blasting shall not exceed the limits listed in Table 3.1.5-1 at the location of any dwelling, public building, school, church, or community or institutional building outside of the permit area.

**Table 3.1.5-1**

**OSMRE MAXIMUM ALLOWABLE PARTICLE VELOCITY**

| Distance From Blast Site (feet) | Maximum Allowable Peak Particle Velocity (in/sec) | Scaled-Distance Factor |
|---|---|---|
| 0 to 300 | 1.25 | 50 |
| 301 to 5,000 | 1.00 | 55 |
| 5,001 and beyond | 0.75 | 65 |
| Source: OSMRE, 30 CFR, Section 816.67(d) | | |

The effects of blasting depend on frequency as well as velocity. In the frequency range from approximately 3 to 15 hertz (Hz), Siskind (1983) recommends a safe peak particle velocity of 0.75 in/sec for drywall in houses and 0.50 in/sec for plaster. Above 15 Hz, the recommended safe vibration levels increase linearly from 0.75 in/sec to 2 in/sec at 40 Hz. Above 40 Hz, 2 in/sec is the recommended safe level of vibration for houses. Five to 60 Hz are typical frequencies that result from blasting.

For this Project, the impact significant criterion for ground vibration is set at 0.5 in/sec, which is below the OSMRE maximum limits shown in Table 3.1.5-1 and is consistent with the regulatory limits established for other projects involving blasting in California.

Although structural damage from blasting does not normally occur unless ground vibrations are greater than 2 in/sec, humans respond to vibrations accompanied by noise at much lower levels. Based on experience from monitoring in residential areas around numerous quarry, mine, and construction blasts, it has been reported that the average individual has the following response to blast vibration and airblast levels (Bender 1991). The scale assumes that the individual is at rest in a quiet location.

| Average Human Response | Vibration (in/sec) | Sound Level (dB) |
|---|---|---|
| Barely | 0.02-0.10 | 50-70 |
| Distinctly to strongly perceptible | 0.10-0.50 | 70-90 |
| Strongly perceptible to mildly unpleasant | 0.50-1.00 | 90-120 |
| Mildly to distinctly unpleasant | 1.00-2.00 | 120-140 |
| Distinctly unpleasant to intolerable | 2.00-10.00 | 140-170 |

As to the threshold of perceptibility, persons cannot detect blast vibration levels lower than 0.01 inches/second. In the absence of blast noise, many people are unable to detect blast vibration levels in the range of 0.03 to 0.06 inches/second, even when they are anticipating the event (Bender 1991).

**Airblast**

When energy from an explosion is released directly into the air, it forms a propagating wave commonly referred to as an airblast. Airblast waves are referred to as noise (frequencies between 20 and 20,000 Hz) and concussion (frequencies below 20 Hz). The airblast waves are measured in terms of overpressure in either dB or pounds per square inch (psi).

Airblasts have not been as thoroughly investigated as ground vibration. The U.S. Bureau of Mines (1980a) and OSMRE give the following airblast damage criteria for nongovernment structures such as residential buildings.

| | |
|---|---|
| "No Damage" threshold of blasting | 128 dB |
| OSMRE limits (above 2 Hz) | 133 dB |
| USBR interim limit of allowable airblast | 136 dB |
| Some large plate glass windows may break | 141 dB |
| Some windows break | 151 dB |
| Most windows break | 171 dB |
| Structural damage | 181 dB |

Factors normally affecting airblast include weather, time, product, depth of individual charges, time delay of individual charges, and physical barriers. Consequently, prediction of actual airblast overpressure is somewhat more difficult than predicting ground vibration. The appropriate regulatory limit for airblast is the limit recommended by both the Bureau of Mines and the OSMRE is 133 dB for airblast.

An additional factor to consider is the perceived noise level resulting from the airblast. Some of the sound pressure frequencies of the airblast are not within the range of human hearing. A blast with an air overpressure of 115 dB, for instance, might be virtually unnoticeable if the predominant frequencies are low (less than 5 Hz). A similar blast with predominant frequencies within the range of human hearing could be quite annoying. With respect to airblast, the magnitude of the blast expressed as overpressure in dB has little to do with whether the blast is audible, and how loud the blast is has little to do with whether or not damage could occur. These factors are indicative of the difficulty in developing a relationship between airblast overpressure and audible noise level. The audible noise component of blasting is best quantified by monitoring during actual blast conditions. However, OSMRE air blast standards have been established in consideration of the human response to airblast.

**Human Response to Blasting**

Bender (1991) summarizes human response to blast vibration as follows. "Human response to blast vibration and airblast is difficult to quantify. Vibration and airblast levels can be felt that are well below those required to produce any damage. Duration of the event has an effect on human response as does the frequency. Events are of relatively short duration, on the order of one or two seconds for millisecond—delayed blasts. Typically, the longer the event and the higher the frequency, the more adverse effect there is on human response. Factors such as frequency of occurrence, fright or the "startle factor", level of activity at the time of the event, health of the individual, time of day, the perceived importance of the blasting operation and other political and economic considerations also have an effect on human response."

In addition, considerable attention has been given in the literature to the inherent problems of determining cause and effect relative to perceived damage from blasting. Many forces are associated with the typical use of residential structures, such as closing doors, walking on structural floors, and normal settlement, that can exert far greater structural strains than properly conducted blasting operations. Although OSMRE regulations do not specifically address criteria for human perception and subjectivity of response, they do provide a considerable measure of protection against adverse reactions. The recommended maximum peak airblast for protection from structural damage is also low enough to meet the strictest criteria for public health promulgated by the Committee on Hearing, Bioacoustics, and Biomechanics (CHABA).

Local Setting

The region in which TMC is located is predominantly mountainous. The primary land uses in the Project vicinity are surface mining, open space, and rural residential. The Angeles National Forest lies generally to the south and southeast of the site. Vacant land borders the site to the north. Few sensitive receptors are located in this area. Three existing surface mines are located within ¼ mile of the eastern site boundary. Further east of those mines (over 2,000 feet east of the eastern site boundary), a single-family dwelling exists at elevations above Soledad Canyon Road, and a few dwellings exist at elevations below Soledad Canyon Road. Most other land adjoining the site is currently vacant and consists of open space. The nearest single-family dwelling (sensitive receptor) to TMC's site is located approximately ¼ mile south of the south-central boundary of Area A (Figure 3.1.5-1). The River's End Trailer Park is located approximately 1,000 feet southwest of the southwest corner of the site. Also, an abandoned residence is located northwest of the site in Bee Canyon. Figure 3.1.5-2 shows an aerial view of the Project and the nearest receptors.

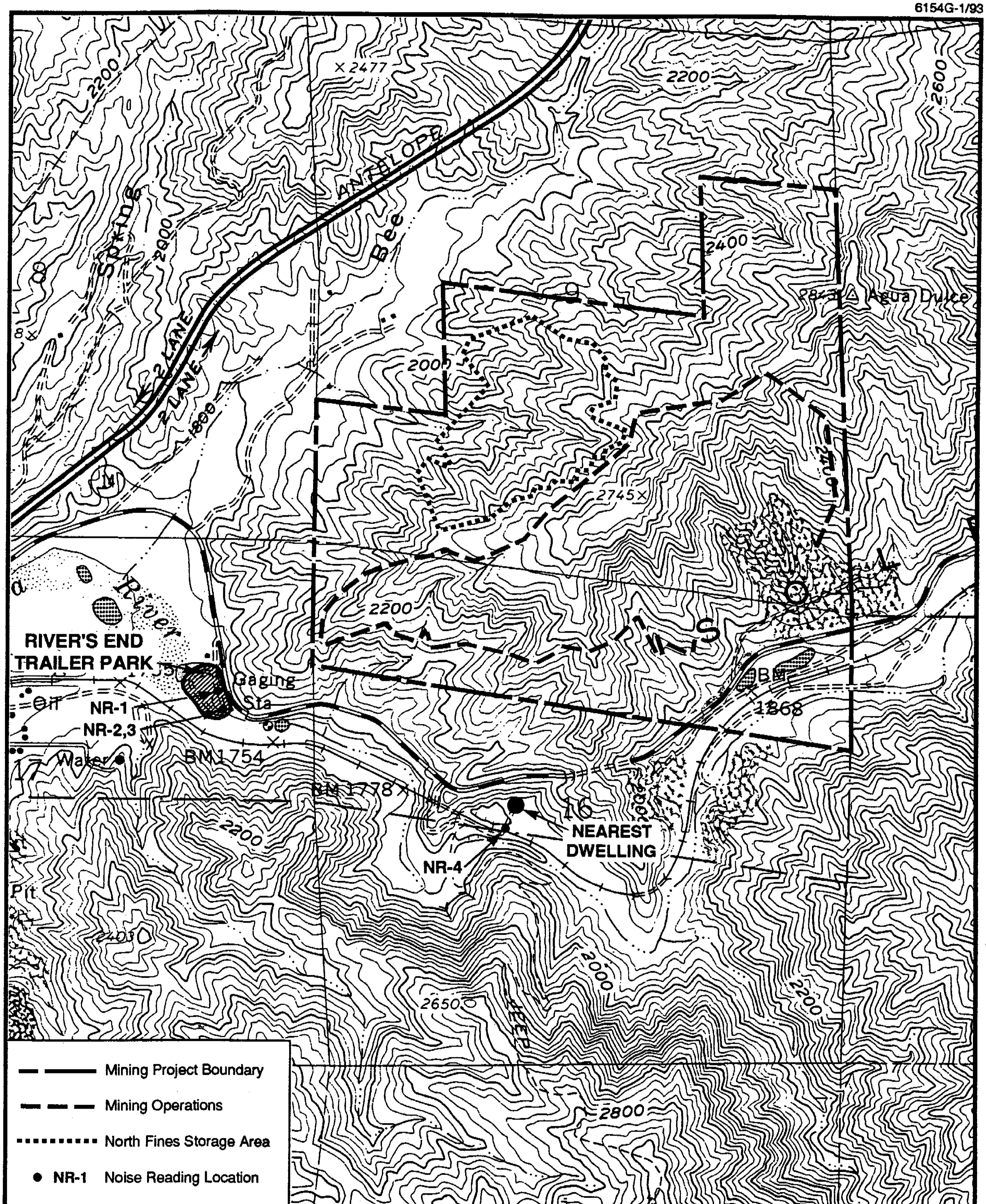
Soledad Canyon Road and a Southern Pacific Transportation Company (SP) railroad right-of-way bisect Area B of the site. A major noise source, the Antelope Valley Freeway, is located about 1,500 feet north of the site.

Currently, most noise in the area is generated by vehicles traveling along these roadways and railroad activity.

In the general site vicinity, and of importance from a noise perspective, is the rural community of Agua Dulce. Agua Dulce Town Center (Agua Dulce Canyon Road and Darling Road) is located nearly 4 miles (about 21,000 feet straight-line distance) from the central area of the Project site. Features existing between the Project site and Agua Dulce include the Antelope Valley Freeway, numerous hills and valleys, and rural residential structures. Some residences within the community are about 15,000 feet (2.8 miles) from the site. The great majority of rural residential units existing within the Town of Agua Dulce area are located between the 2,450- and 2,550-foot elevations, whereas the TMC Project site is between the 1,875 and 2,745-foot elevations.

Site-Generated Noise Levels

To assess existing noise levels at the site, Chambers Group conducted field monitoring on February 21, 1992, using a Larson-Davis LDL Model 700 Dosimeter/Type 2 integrating sound level meter. The meter meets the American National Standards Institute (ANSI) Standard S1-4-1983, Type 2, and International Electrotechnical Commission Standard 651, Type 2.

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Source: USGS 1:24,000 series
Agua Dulce, CA

**NOISE LEVEL MEASUREMENT LOCATIONS OBTAINED IN PROXIMITY TO SENSITIVE RECEPTORS**

**Figure 3.1.5-1**


SOURCE: Chambers Group, Inc.

**AERIAL PHOTO OF THE PROJECT SITE AND SURROUNDING SENSITIVE NOISE RECEPTORS**
**Figure 3.1.5-2**

The meter was calibrated prior to the first set of readings. The accuracy of the calibrator is maintained through a program established through the manufacturer and is traceable to the National Bureau of Standards. The calibrator meets the requirements of ANSI Standard S1.2-1971 and the International Electrotechnical Commission Publication 123-1961. Three onsite noise levels were recorded as described below.

1. The first onsite noise level measurement was taken on a bench (graded area) southeast of the existing facility from 9:40 to 9:50 a.m. During this period, a front-end loader was loading large rocks for riprap into semitrucks for export offsite. Two other idling trucks waiting to be loaded were located approximately 100 feet away. The meter was situated on the same side of the truck that the loader was dropping into. Although the meter was set 50 feet from the center of the semitrailer, the distance to the loader varied as the loader picked up the riprap and deposited it in the trailer. The distance from the meter to the loader ranged from approximately 10 feet to as much as 60 feet. The measured Leq was 83.9 dBA, with peaked as high as 100.5 dBA.

2. The second onsite noise level measurement was taken in the same area, but the meter was situated on the far side of the semitruck from the loader. Again, two other semitrucks were idling nearby, both with their engines approximately 50 feet away. The noise reading was obtained from 9:55 to 10:05 a.m. The Leq was 73.7 dBA, with a peak of 93.0 dBA.

3. The third noise level was obtained approximately 1,000 feet from the truck-loading activity at an elevation approximately 100 feet below the first two readings and 350 feet southwest of the rock plant that was not operating. A light breeze was stirring (less than 5 miles per hour [mph]). From this point, the dominant noise source was vehicle traffic on Soledad Canyon Road. Other observed noise sources included bird calls, two jet and two propeller-powered airplane overflights, and the river across Soledad Canyon Road. The truck-loading activities were barely audible in the background, with the only discernible noise being from the loader's backup alarm. The reading was obtained from 10:15 to 10:25 a.m. The observed Leq was 46.4 dBA, with a peak of 59.5 dBA. Levels similar to this would be expected across undeveloped portions of the site and for the area in general.

<u>**Road-Generated Noise Levels**</u>

To assess noise contribution from traffic on Soledad Canyon Road, noise levels were measured from the front of the C.A. Rasmussen facility approximately 50 feet west of its entrance gate across from the site on Soledad Canyon Road. Because of the mountain to the north and canyon to the south, the meter could only be placed about 45 feet from the centerline of the road. Due to logistics, the meter was situated across from a 50- to 60-foot-high embankment. Behind the meter were mounds of dirt lining the road with heights ranging from approximately 3 to 5.5 feet. The reading was taken from 10:57 to 11:07 a.m., and an Leq of 61.5 dBA was obtained. During this period, 18 automobiles were observed. No light or heavy trucks passed by on Soledad Canyon Road during this period; however, three heavy trucks proceeded up and one down the grade across the road currently leading to the Project site. These trucks were approximately 150 feet from the meter at an elevation of approximately 50 feet above the meter. The noise of the trucks climbing the hill and using engine braking down the hill was obvious above the sparse traffic. Additionally, one jet and two propeller-powered airplane overflights were observed. The average speed of vehicles on this section of Soledad Canyon Road was approximately 45 to 55 mph.

When modeled using the Federal Highways Administration (FHWA) Highway Noise Prediction Model, this assemblage of automobiles is predicted to generate an Leq noise level of 59 dBA (based on an average speed of 50 mph). Discrepancies between the noise level predicted by the model and the measured value may be due to the following:

- truck traffic moving up to the access road to the Curtis Sand and Gravel site raised the noise level, although these trucks were not included in the vehicle count;
- the embankment across the road reflected noise back to the meter, thus raising the measured noise level;
- the passing jet raised the measured Leq; or
- the road was on a grade, which can raise the Leq.

In consideration of these variables, the FHWA model is fairly accurate in its prediction of noise for the road conditions.

The site is located along Soledad Canyon Road, approximately 2.9 miles east of the Antelope Valley Freeway. Site access is from Soledad Canyon Road. The average daily traffic (ADT) along this stretch is approximately 2,600 vehicles per day. The ADT along Soledad Canyon Road between the Antelope Valley Freeway and Lang Station is estimated at 4,950 (Associated Transportation Engineers [ATE] 1997). The traffic volume for Antelope Valley Freeway at Soledad Canyon Road is 76,000 ADT (Caltrans 1996a).

Traffic noise was modeled using the Caltrans FHWA Highway Noise Prediction Model, California vehicle noise (CALVENO) version for current and anticipated traffic levels at the time of Project completion. The model calculates the Leq noise level for a particular reference set of input conditions and makes a series of adjustments for site-specific traffic volumes and mixes, distances, speeds, and noise barriers.

In calculating CNEL values, the following methodology was used:

- The morning rush hour period lasts from 6:00 to 9:00 a.m., and the traffic volume for each hour of this rush hour is equal to 2 hours of standard, nonrush-hour daytime traffic.
- The evening rush hour lasts from 4:00 to 7:00 p.m. and, like the morning rush hour, the traffic volume for each hour of this rush hour is also equal to 2 hours of standard, nonrush-hour daytime traffic.

- Nighttime traffic is equal to 15 percent of the total ADT and is divided between the hours of 10:00 p.m. to 6:00 a.m.

- In the calculation of a CNEL value, evening traffic (7:00 to 10:00 p.m.) was given a 5-dBA penalty, and nighttime traffic (10:00 p.m. to 7:00 a.m.) was given a 10-dBA penalty added to its predicted value.

- Traffic noise levels are as measured 50 feet from the centerline of the road under study.

The vehicle mix for Antelope Valley Freeway was taken from the 1995 Annual Average Daily Truck Traffic on the California State Highway System (Caltrans 1996b). This mix was also applied to Soledad Canyon Road. The roadways addressed in this study are listed in Table 3.1.5-2 along with the traffic mix, average speed, and CNEL as measured 50 feet from the roadway centerline. Most of the area surrounding Soledad Canyon Road is open field and mountain terrain and is considered "soft," with an atmospheric attenuation of 4.5 dBA each time the distance is doubled. The calculated distances from the centerline to the 75-, 70-, 65-, and 60-dBA CNEL contours are presented in Table 3.1.5-3. Note that no sensitive receptors are currently subject to noise levels above the 65-dBA CNEL criterion along Soledad Canyon Road.

<u>Railroad-Generated Noise Levels</u>

The Project site is located next to the SP railroad line. Typically, SP runs eight trains on this line in a 24-hour period. Because these trains are infrequent and on an as-needed basis, no day/night split (i.e., percentage of night operations) could be ascertained. Thus, the standard day/night split of 15 percent nighttime operations was assumed. These trains typically have four engines and vary in length from 40 to 90 rail cars.

Metrolink also runs eight operations on this line, with two occurring at night. These trains are six to eight cars long with two engines. An average speed of 35 mph was assumed. Based on this information, Table 3.1.5-4 provides the CNEL values generated from these operations.

<u>Proximate Receptor Noise Levels</u>

Noise level readings were also taken in proximity to the local sensitive receptors on October 14, 1992. The first reading (NR-1) was obtained at the River's End Trailer Park next to the trailers as shown on Figure 3.1.5-1. This 15-minute reading was obtained from 10:38 to 10:55 a.m. (including a 2-minute pause while a resident started his truck near the meter). Soledad Canyon Road is located approximately 60 feet east and approximately 40 feet above the monitored location. Winds were from 3 to 6 mph. The ambient noise included approximately 14 vehicles passing on Soledad Canyon Road, five aircraft overflights, wind rustling through the trees, bird calls, and Antelope Valley Freeway traffic audible in the background. The Leq was 50.8 dBA, with minimum and maximum values of 41.0 and 65.0 dBA, respectively.

## Table 3.1.5-2

## TRAFFIC MIX AND CNEL FOR SITE LOCAL ROADWAYS

| Road Name | Locale | ADT | No. Autos | No. Medium Trucks | No. Heavy Trucks | Average Speed (mph) | CNEL (dBA) |
|---|---|---|---|---|---|---|---|
| Soledad Canyon Road[1] | At Facility Site | 2,600 | 2,449 | 77 | 74 | 45 | 64 |
| Soledad Canyon Road[1] | At Antelope Valley Freeway | 4,950 | 3,233 | 13 | 3 | 45 | 67 |
| Antelope Valley Freeway[2] | At Soledad Canyon Road | 76,000 | 71,592 | 2,252 | 2,156 | 65 | 82 |

**[1] Vehicle ratios based on Antelope Valley Freeway.**
**[2] ADT per vehicle mix per Caltrans 1996b.**

## Table 3.1.5-3

## DISTANCES TO THE 75-, 70-, 65-, AND 60-dBA CNEL CONTOURS FOR SITE ACCESS ROADWAYS

| Road Name | Locale | Average ADT | CNEL @ 50 (dBA) | Dist to 75-dBA CNEL (feet) | Dist to 70-dBA CNEL (feet) | Dist to 65-dBA CNEL (feet) | Dist to 60-dBA CNEL (feet) |
|---|---|---|---|---|---|---|---|
| Soledad Canyon Road[1] | At Facility Site | 2,600 | 64 | <50 | <50 | <50 | 92 |
| Soledad Canyon Road[1] | At Antelope Valley Freeway | 4,950 | 67 | <50 | <50 | 68 | 146 |
| Antelope Valley Freeway[2] | At Soledad Canyon Road | 76,000 | 82 | 146 | 315 | 680 | 1,464 |

**[1] Vehicle ratios based on Antelope Valley Freeway.**
**[2] ADT per vehicle mix per Caltrans 1996b.**

**Table 3.1.5-4**

**CNEL FROM RAILROAD OPERATIONS IN PROXIMITY TO TMC SITE IN SOLEDAD CANYON[1]**

| Distance From Rails (feet) | CNEL (dBA) |
|---|---|
| 50 | 72.0 |
| 100 | 67.5 |
| 200 | 63.0 |
| 400 | 58.5 |
| 800 | 54.0 |
| 1,320 | 50.7 |
| 2,640 | 46.2 |
| 5,280 | 41.7 |

[1] Table is based on data presented in the text and calculated from Ldn nomographs contained in *The Noise Guidebook* (HUD, 1985). CNEL values are assumed to be equivalent but could be as much as 1 dBA greater than presented.

A second reading (NR-2) was obtained in the trailer park near the river (Figure 3.1.5-1). At the beginning of the reading at 10:58 a.m., a train came by directly across the river at a distance of about 200 feet. The train, traveling at approximately 25 mph, passed for about 2 minutes and produced an Leq of 74.3 dBA.

A third reading (NR-3) was obtained at the same location as the second reading, approximately 150 feet west of Soledad Canyon Road at an elevation about 40 feet below the grade of the road. The reading was obtained from 11:01 to 11:11 a.m. During this period, approximately nine vehicles passed by on Soledad Canyon Road, and three aircraft overflights were noted. Other noises were as recorded for the first reading. The measured Leq was 48.0 dBA, with minimum and maximum values of 41.0 and 59.0 dBA, respectively.

A fourth reading (NR-4) was obtained at the terminus of Capra Road next to the dwelling. The reading was obtained from 11:25 to 11:35 a.m. Winds were from 3 to 8 mph. Ambient sounds included traffic (approximately 14 vehicles) on Soledad Canyon Road, wind noise, leaves rustling in the trees, and bird calls. The Leq was 52.4 dBA, with minimum and maximum values of 34.0 and 74.5 dBA, respectively.

## Agua Dulce Noise Levels

As noted above, sensitive receptors are also located in the town of Agua Dulce and its outlying areas. To determine ambient noise levels in the Agua Dulce area, onsite noise level monitoring was conducted on July 8 and 9, 1997. Noise level measurements were obtained using a Quest Technologies Model 2900 Type 2 Integrating/Logging Sound Level Meter. The unit meets the ANSI Standard S1.4-1983 for Type 2, International Electrotechnical Commission Standard 651-1979 for Type 2, and International Electrotechnical Commission Standard 651-1979 for Type 2 sound level meters. The unit was calibrated at 5:45 p.m. using a Quest Technologies

QC-10 calibrator immediately prior to the first set of readings. The accuracy of the calibrator is maintained through a program established through the manufacturer and is traceable to the National Bureau of Standards. The calibrator meets the requirements of the ANSI Standard S1.4-1984 and the International Electrotechnical Commission Standard 942-1988 for Class 1 equipment.

All measurements were obtained across from 32000 Haskett Road. The actual location was beside the mail box noted as "Soder Ranch" listed at 12235 West Trail Road. This location is located south of Davenport Road and is the most proximate location accessible over paved roads within the Agua Dulce area to the Project site with a view across the freeway. Additionally, the location was well off the main road (i.e., Davenport Road) and would be considerably quieter than homes located more proximate to Agua Dulce Canyon Road and Davenport Road. From the monitored location, a small portion of the Antelope Valley Freeway was visible through the valley.

Five 15-minute noise level measurements were obtained at this location. Each is described below:

The first was obtained at 5:55 p.m. and was intended to determine the ambient noise associated with the p.m. rush hour. Highway noise was barely audible in the background. Several aircraft overflights were also noted. During the measurement, three cars passed by the metered location. One of these cars stopped at the meter and idled so that the occupant could pick up his mail. The meter indicated an Leq of 50.2 dBA with 1-second minimum and maximum values of 31.3 and 70.9 dBA, respectively. While the Leq value was skewed due to the idling vehicle, such activities commonly affect ambient noise. Still, such occurrences may not be truly applicable to the noise produced at receptor locations located further from the road(s). The L50 represents the noise level that is exceeded 50 percent of the time, whereas the Leq represents the average noise level. Using simple mathematics, one would expect the 50-percent value to represent the average. However, noise is a logarithmic function and short-duration, loud events will raise the Leq but do not affect the L50. As such, the L50 descriptor presents a reasonable estimation of the Leq, barring anomalies. (In actual practice, the L50 is usually 0 to 2 dBA less than the Leq and never greater than the Leq.) During this reading, an L50 of 41.4 dBA was recorded. To account for the passing and idling vehicles, the measurement was repeated at 6:15 p.m. Local traffic on the I-14 had subsided somewhat, and fewer aircraft overflights were noted. No cars passed during the measurement. During this measurement, the meter indicated an Leq of 44.9 dBA with 1-second minimum and maximum values of 28.9 and 63.4 dBA, respectively. The L50 was recorded at 36.6 dBA.

Because TMC operations could feasibly take place until 10:00 p.m., it was deemed necessary to procure readings during this time to assess the Project's contribution to the nighttime noise regime. As such, a 15-minute measurement was obtained at 10:47 p.m. Ambient noise included dogs barking in the background and crickets chirping. Two distant overflights were also noted. The meter indicated an Leq of 45.5 dBA with 1-second minimum and maximum values of 41.6 and 51.3 dBA, respectively. The L50 was recorded at 45.4 dBA.

TMC proposes to begin operations as early as 5:00 a.m., and it was deemed necessary to procure readings during this time to assess the Project's contribution to the early morning noise regime. A 15-minute measurement was obtained at 5:00 a.m. Ambient noise included dogs barking near the meter (a couple of barks once). Freeway traffic was still light, and the a.m. rush hour had yet to peak. The meter indicated an Leq of 58.7 dBA with 1-second minimum and maximum values of 35.9 and 87.0 dBA, respectively. The L50 was recorded at 39.9 dBA.

A subsequent measurement was obtained to determine the ambient noise during the a.m. rush hour. The reading was taken at 5:45 a.m. Ambient noise included dogs barking in the background. Additionally, one car passed the meter once in each direction (newspaper delivery). Freeway traffic was clearly audible. The meter indicated an Leq of 52.3 dBA with 1-second minimum and maximum values of 38.3 and 75.3 dBA, respectively. The L50 was recorded at 47.4 dBA.

### 3.1.5.2 Environmental Effects

Significance Criteria

The Project has the potential to elevate local noise levels in two ways. Onsite construction and subsequent operations can raise the noise level in proximity to the site because of using heavy equipment, conducting periodic blasting, processing sand and rock, and manufacturing concrete. Additionally, the use of heavy trucks and, to a lesser extent, automobiles used to deliver materials and workers to and from the site will raise noise levels on all major routes of travel.

The Project has the potential to produce perceptible ground vibration as a result of conducting periodic blasting. The blasting is necessary to aid the excavation of the sand and gravel in the conglomerate formation.

Noise impacts were considered significant if the Project:

- produced noise levels that exceed County or local noise ordinances,
- raised the ambient CNEL by 3 dBA and the resultant noise level exceeded the level specified in the applicable ordinances, and/or
- raised the ambient CNEL 5 dBA and remained under the level specified in the applicable ordinances.

For this site, the County noise ordinance (significance criteria) is 65 dBA CNEL as measured at the perimeter of any structure with sensitive receptors inside.

Vibration impacts were considered significant if the Project:

- produced ground vibration in excess of 0.5 in/sec at the perimeter of any residential receptors, and/or

- produced airblast waves exceeding 133 dB at the perimeter of any offsite habitable structure.

The vibration limit of 0.5 in/sec and the airblast limit of 133 dB (within the range of 1 to 100 Hz) are more than sufficient to protect typical residential structures from damage. However, a ground vibration of 0.5 in/sec will be strongly perceptible to most people and possibly annoying to some.

## Construction Noise Impacts

Construction noise represents a short-term impact on ambient noise levels because noise levels produced by construction activities can reach high levels. Initially, an aggregate processing facility and concrete batch plant will be constructed. Current plans call for a 9-month preconstruction grading schedule followed by a 6-month construction schedule. This will require the use of heavy equipment during the temporary project construction phase. These activities are intrinsically noisy. The noise emissions will be most heavily concentrated in the immediate vicinity of the structures being erected. Noise emissions will result primarily from mobile sources; however, temporary placement of stationary sources may also occur.

Because all of the details of construction have not been finalized, the exact type of equipment cannot be determined accurately at this time. One can, however, assume that a generic type of equipment is performing onsite activities and bringing in concrete and other building materials.

Noise emission levels from an area source of equipment activity were based on the literature value presented by Bolt, Beranek, and Newman (1971). A value of 89 dBA is the predicted average noise for construction of industrial and commercial facilities (also see Operational Noise Impacts, below). The calculated noise level from this construction activity with distance is as follows:

| Sound Level (dBA)* | Distance From Construction Activities (feet) |
|---|---|
| 89 | 50 |
| 83 | 100 |
| 77 | 200 |
| 71 | 400 |
| 65 | 800 |
| 53 | 3,000 (nearest sensitive receptor) |
| 43 | 10,500 (nearest receptor in Agua Dulce area) |
| 37 | 21,000 (Agua Dulce Town Center) |
| * Based solely on atmospheric attenuation of 6 dBA for each doubling of distance from the source. | |

Note that the nearest sensitive receptor to the construction effort (i.e., the resident at the end of Capra Road) is listed as 3,000 feet from most of the area of active construction, although this receptor is actually only approximately ¼ mile from the nearest site boundary.

Figure 3.1.5-3 shows the anticipated noise contours resulting from site grading and construction. Note that this figure omits the grading of the fines storage area access road, which would require only minimal equipment and time for its grading.

The values presented above and on Figure 3.1.5-3 address only atmospheric attenuation. Because the topography of the area is mountainous, anticipated noise levels will be much lower than presented here. According to the FHWA, a berm can reduce noise propagation by as much as 23 dBA. Because local terrain blocks the line of sight and serves as a berm and because of the extended distances between the site and any sensitive receptors, no significant adverse impacts are anticipated from construction of the facility. Based on the field study, ambient noise in the Agua Dulce area is approximately 45 dBA at the receptor locations. The noise from construction will add up to 2 dBA at the most proximate receptors in the Agua Dulce area and less than 1 dBA at the town center. These increases in noise are virtually nondetectable and will have a less-than-significant impact.

Noise will also be produced by worker and delivery trucks accessing the site. Preconstruction is anticipated at 9 months and will use 10 workers and as many as two trucks on a daily basis. Actual erection of the structures may require that as many as 25 workers travel to the site from the County area on a daily basis. Additionally, after the initial grading period, more haul trucks will be used to bring building materials to the site on a regular basis. Four trucks bringing in supplies were assumed on a daily basis. This additional volume of traffic will raise the CNEL by less than 1 dBA, and no significant impacts are anticipated.

Another area of potential concern is from any blasting operations that may be necessary for construction. If blasting is to be performed, then the single-event level will temporarily far exceed the long-term construction activity noise levels and thus create a brief noise intrusion over a very wide area. These impacts are potentially significant but would occur only over a short time period.

<u>Operational Noise Impacts</u>

After completion of initial construction, operational noise will be generated by onsite operations and increased vehicle traffic offsite. Onsite activities that will generate noise include (1) blasting operations conducted in conjunction with excavation operations, (2) the use of onsite heavy equipment for excavation and transport of aggregate to the plant, and (3) processing facility and batch plant operations including loading facilities for trucks and activities associated with the equipment and maintenance shop. Offsite noise generation will be related to offsite vehicle travel. Both onsite and offsite aspects are described below.

**Blasting**

When blasting is to be performed, the single-event noise level may temporarily exceed the long-term excavation activity noise levels and thus create a brief noise intrusion. The site is composed mainly of conglomerate materials, consisting of tightly compacted sand and gravel. In order to efficiently excavate the conglomerate, a program of low-yield blasting will be implemented to loosen the material. The actual blasting is a rapid event, typically lasting only

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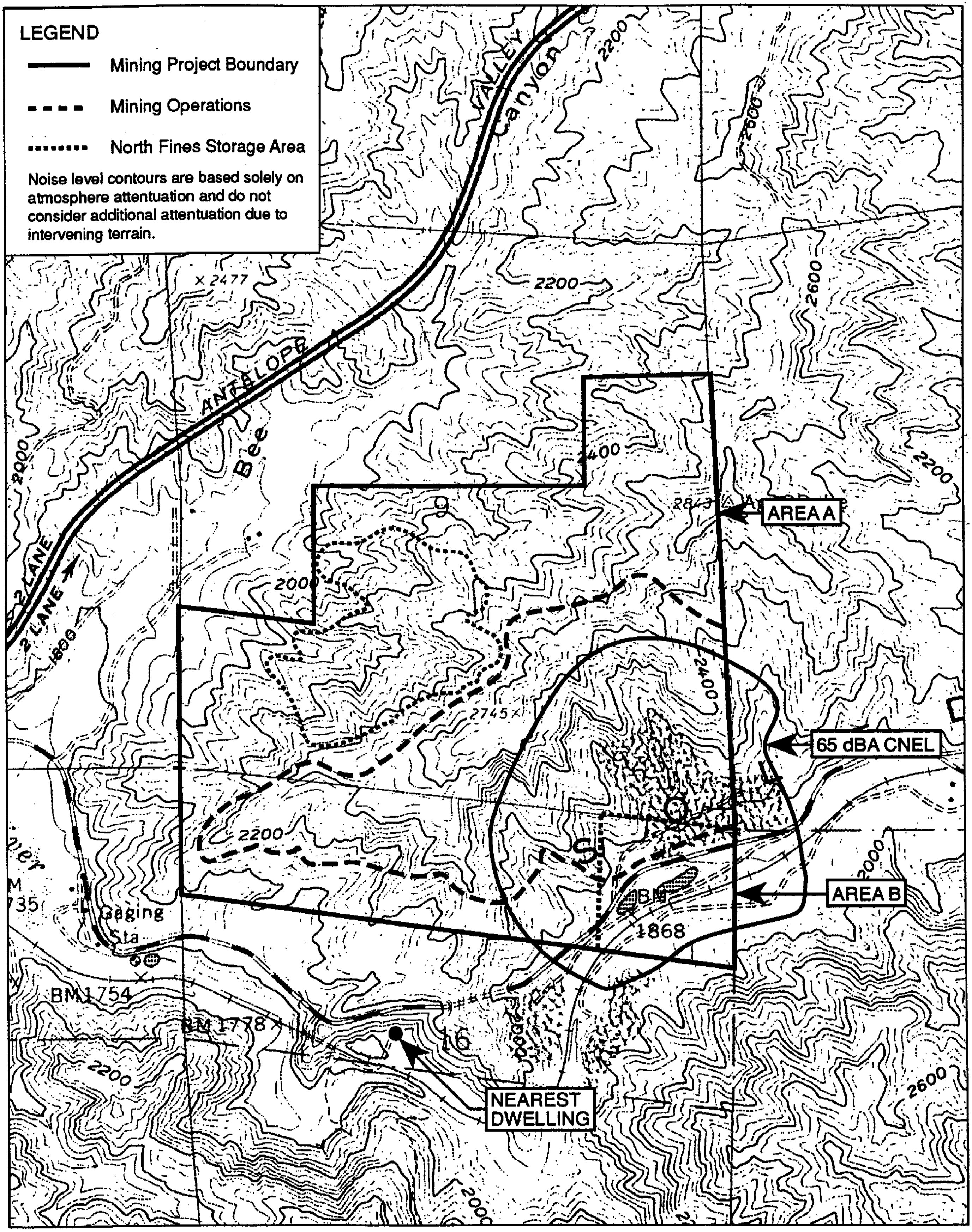


N

Feet

0 1330

SOURCE: Environmental Solutions, 1992

## CONSTRUCTION NOISE CONTOURS

**Figure 3.1.5-3**

seconds. Due to the placement of charges underground, this blasting typically produces less noise than the heavy equipment used in the mining operation. Furthermore, because the occurrence is so brief, it does not significantly raise the CNEL but could be more of a nuisance impact due to potential ground vibrations. Rock drills used to create holes for blasting charges are another noise source. The use of these drills, however, is not projected to create a greater noise level than that predicted for pit operations and will not raise the offsite CNEL above predicted levels.

A typical blast may involve approximately 17,600 cubic yards of conglomerate sand and gravel material. Approximately 0.5 pound per cubic yard of the explosive agent ammonium nitrate/fuel oil (ANFO) will be required to loosen the material. Charges of 200 pounds each will be detonated per delay period, with a typical blast event of 44 charges or 8,800 total pounds of ANFO. The purpose of the delay period is to minimize the sound and vibrational impact of the blast event. The impacts of the blast event are then characterized using the size of the individual charge (Calder & Workman, Inc. 1996).

As noted in the discussion of significance criteria, an impact may also be significant if it creates vibration in excess of 0.5 in/sec at the perimeter of any of the proximate residential structures. Vibration created from subsurface blasting is approximated using data prepared for the military (Gould and Tempo 1981), as follows:

$$V_{max} = 2{,}700\ (D/W^{1/3})^{-1.4}$$

where

$V_{max}$ = resultant peak particle velocity (centimeters per second [cm/sec])
$D$ = distance (m)
$W$ = TNT-equivalent weight (tons)

For proximate receptor locations,

$D$ = 1,320 ft / 3.28 ft/m = 402.4 m
$W$ = 200 lbs / 2,000 lb/ton = 0.1 tons

(The referenced document notes that, with respect to ground cratering, ANFO has a TNT equivalent weight of 1.00).

$$V_{max} = 2{,}700\ (402.4/0.1^{1/3})^{-1.4}$$
$$V_{max} = 0.21 \text{ cm/sec} / 2.54 \text{ in/cm} = 0.08 \text{ in/sec}$$

This value (0.08 in/sec), applicable to the residence on Capra Road, is below the vibration significance criteria and is considered less than significant. This level of vibration could be characterized as "barely perceptible" by humans and would not damage residential structures. By using the same methodology, the motion velocity of blasting vibration projected to River's End Trailer Park would be 0.12 in/sec, which is also less than significant. If the Bee Canyon

Mobile Home Park is constructed, vibration levels during Cut 3 blasting would be 0.32 in/sec (at a distance of 500 feet). The impact would not be significant.

For those proximate residents located in the Agua Dulce area (2.8 miles from the Project site), the calculated vibration is 0.0028 in/sec, which is not significant and is also below the perception thresholds of humans. Finally, the vibration at the Agua Dulce Town Center located at about 4 miles from the Project site is calculated at 0.0017 in/sec which is not significant.

Precise prediction of the impact due to airblast is difficult due to the number of variables that can affect the propagation of air overpressure. For purposes of this impact analysis, the impacts are considered potentially significant. However, airblast can be effectively modified by altering the blast design, and it can be monitored for compliance. The Applicant has agreed to conduct blasting operations in compliance with OSMRE standards including a blasting monitoring program (see Mitigation Measure N1). As previously discussed, OSMRE standards have been developed to provide adequate protection to receptors from both ground vibration and air overpressure. In addition, airblast impacts will be substantially attenuated at most receptor locations by the intervening ridgeline.

The Project blasting ground vibrations will range from barely perceptible (at Capra Road residence), to distinctly perceptible (at River's End Trailer Park), to strongly perceptible (if Bee Canyon Mobile Home Park is built). Because of the variation in human response to these levels of vibration that otherwise could be considered not significant, the Applicant has agreed to comply with OSMRE regulations requiring a public awareness program including notification of local residences and businesses of the blasting schedule and other facets related to blasting. The public awareness program will be conducted, at a minimum, for residents living within ½ mile of blasting (see Mitigation Measure N1).

**Excavation and Onsite Aggregate Transport**

Excavation, or pit, activities will require the use of the heavy equipment listed in Table 3.1.5-5. These activities are intrinsically noisy. Noise emissions, which will be most heavily concentrated within the immediate vicinity of the active mining area, will result primarily from mobile sources. Onsite heavy equipment used to excavate material will use a pit loader and haul trucks to move material to a mobile crusher/conveyor system that subsequently delivers the material to the surgepile.

The noise from heavy excavating equipment was assessed by field monitoring conducted by Chambers Group for TMC at its Azusa Quarry on September 16, 1992. During this survey, a Demag shovel was observed to remove aggregate and load a Haulpack offroad truck. The meter was situated toward the noisy end of both the shovel and truck (the engine side for both pieces) at a distance of 100 feet. The measured Leq was 85.4 dBA during the actual loading of the truck including the noise of the rock and aggregate falling into the truck bed. When the truck left to deliver its load to the crusher, the shovel continued to dig. When the truck was no longer present, the shovel was again monitored, and an Leq of 85.5 dBA was observed. This high Leq was observed because, even though the truck was no longer present, the shovel was actively digging and required more power to dig than it did to load. During the reading, the cliff wall

**Table 3.1.5-5**

**HEAVY EQUIPMENT INVOLVED IN EXCAVATION ACTIVITIES**

| Type of Equipment | No. of Pieces |
|---|---|
| Pit Loader (13 cubic yard) | 1 or 2 |
| D-10 Dozer | 1 |
| Earthmover (scraper) | Phase 1: 1/Phase 2: 2 |
| 100-ton haul trucks | 2 to 4 |
| Compactor | 1 |
| Portable drilling unit | 1 |
| Semiportable primary crusher | Phase 1: 1/Phase 2: 2 |
| Conveyor system | Phase 1: 1/Phase 2: 2 |

into which the shovel was digging reflected noise back toward the meter. Based on the hardness of the material, this reflection can raise measured noise by as much as 3 dBA. It should be noted that the Demag is considerably larger and noisier than the proposed newer pit loader, and actual noise from the Soledad Canyon operation would be less than presented. However, to present a reasonable worst-case scenario, a noise level of 85 dBA will be used in this analysis.

The operation will also use a mobile primary crusher in the excavation area to reduce onsite trucking of materials (and its associated pollutants). Noise from the primary crusher at the TMC Azusa facility was monitored on September 16, 1992. The noise produced by the crusher was measured at 83.3 dBA Leq at a distance of approximately 100 feet. Based on the action of the shovel, haultruck, and crusher, excavation activities are anticipated to generate a noise level of 87 dBA as measured at a distance of 100 feet. From this 87-dBA Leq, the CNEL was determined. A typical operations scenario assumes that excavation activities will occur during daylight hours, from approximately 6:00 a.m. to 8:00 p.m. Based on the 87-dBA Leq, adding 10 dBA to the 6:00 a.m. to 7:00 a.m. period and 5 dBA to the 7:00 p.m. to 8:00 p.m. period gives a CNEL of 87 dBA as measured at a distance of 100 feet from the excavation activities. (Note that, by coincidence, this happens to be the same as the Leq value.) Based on a more typical 12-hour-per-day operation between the hours of 7:00 a.m. and 7:00 p.m., the CNEL would be reduced to 84 dBA. During infrequent periods of late night operation, the CNEL at 100 feet from excavation would increase to 88.2 dBA (for operations up to 10:00 p.m.) and to 92.3 CNEL (for operations extending to 3:00 a.m.).

Other pieces of equipment will also be located within the excavation. However, because these pieces will be moving around the area, their noise will not add to the overall noise level but will spread the noise around the excavation. Because the 87-dBA CNEL predicted for the combined efforts of the pit loader, haul truck, and crusher is modeled as emanating from the boundaries of the excavation, this other equipment will not raise the offsite noise level.

Onsite-generated noise will be reduced by atmospheric attenuation at a rate of 6 dBA each time the distance doubles. In addition, terrain that shields receptors or blocks the line of sight will further attenuate the noise level by as much as 23 dBA. This second means of attenuation depends on the height and width of the barrier and the materials from which the barrier is constructed. Soft surfaces, such as sand, bushes, trees, and soil, absorb noise, which further reduces the sound pressure level with distance. Unfortunately, quantifying the attenuation that a noise source will receive at a receptor site is not possible (except by measuring actual conditions during mining operations).

The 87-dBA value for typical operations used in this analysis is considered conservative when considering that the onsite measured noise level for the loader dropping riprap into a semitrailer with the trailer located 50 feet away and the loader varying in distance from 10 feet to as much as 60 feet produced an Leq of 83.9 dBA. Based on an excavation noise level of 87 dBA at 100 feet, the following presents the anticipated noise levels at varying distances from the excavation activities. This information has been compiled into noise contours, and the 65-dBA CNEL is depicted on Figure 3.1.5-4. Note that the CNEL contour encompasses work for the entire site including excavation activity and fines placement. In actuality, excavation work will proceed in one area at a time such that, on a daily basis, the 65-dBA CNEL would not extend to the contours shown.

| Sound Level (dBA)* | Distance From Mining Operation (feet) |
|---|---|
| 93 | 50 |
| 87 | 100 |
| 81 | 200 |
| 75 | 400 |
| 67 | 1,000 (River's End Trailer Park) |
| 65 | 1,255 |
| 65 | 1,320 (single-family dwelling on Capra Road) |
| 58 | 3,000 |
| 47 | 10,500 (nearest receptor in Agua Dulce area) |
| 41 | 21,000 (Agua Dulce Town Center) |

* **Based solely on atmospheric attenuation of 6 dBA for each doubling of distance from the source. Also, based on direct line of sight with no intervening terrain.**

Nearby receptors include the residence on Capra Road, located approximately ¼ mile south of the south-central portion of the site, and residents at the River's End Trailer Park, located approximately 1,000 feet from the southwest corner of the site. The proposed Bee Canyon Mobile Home Park would also be a noise receptor if approved and constructed. The anticipated excavation noise at the nearest existing receptors would be lower than presented because of the intervening landscape, which would effectively shield the receptors from this noise, and no significant impacts from excavation operations would be produced. With respect to the proposed Bee Canyon Mobile Home Park (Specific Plan for Bee Canyon, October 1995), the 65 CNEL contour as shown on Figure 3.1.5-5 intersects approximately 72 proposed trailer lots adjacent to the western boundary of the Project site. These potential future lots could experience significant noise impact from the mining of Cut 3 (see Mitigation Measure N2). Other mining

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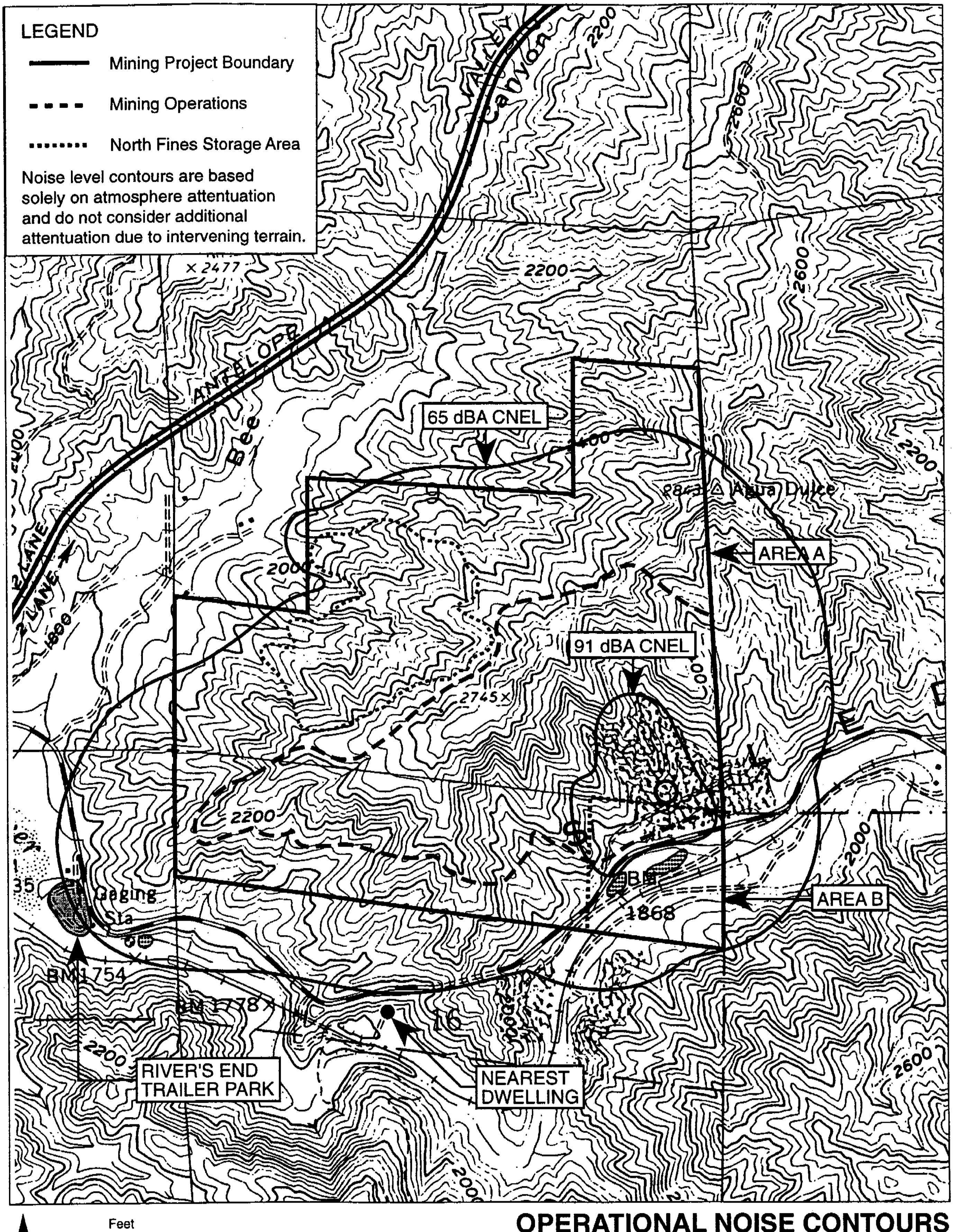
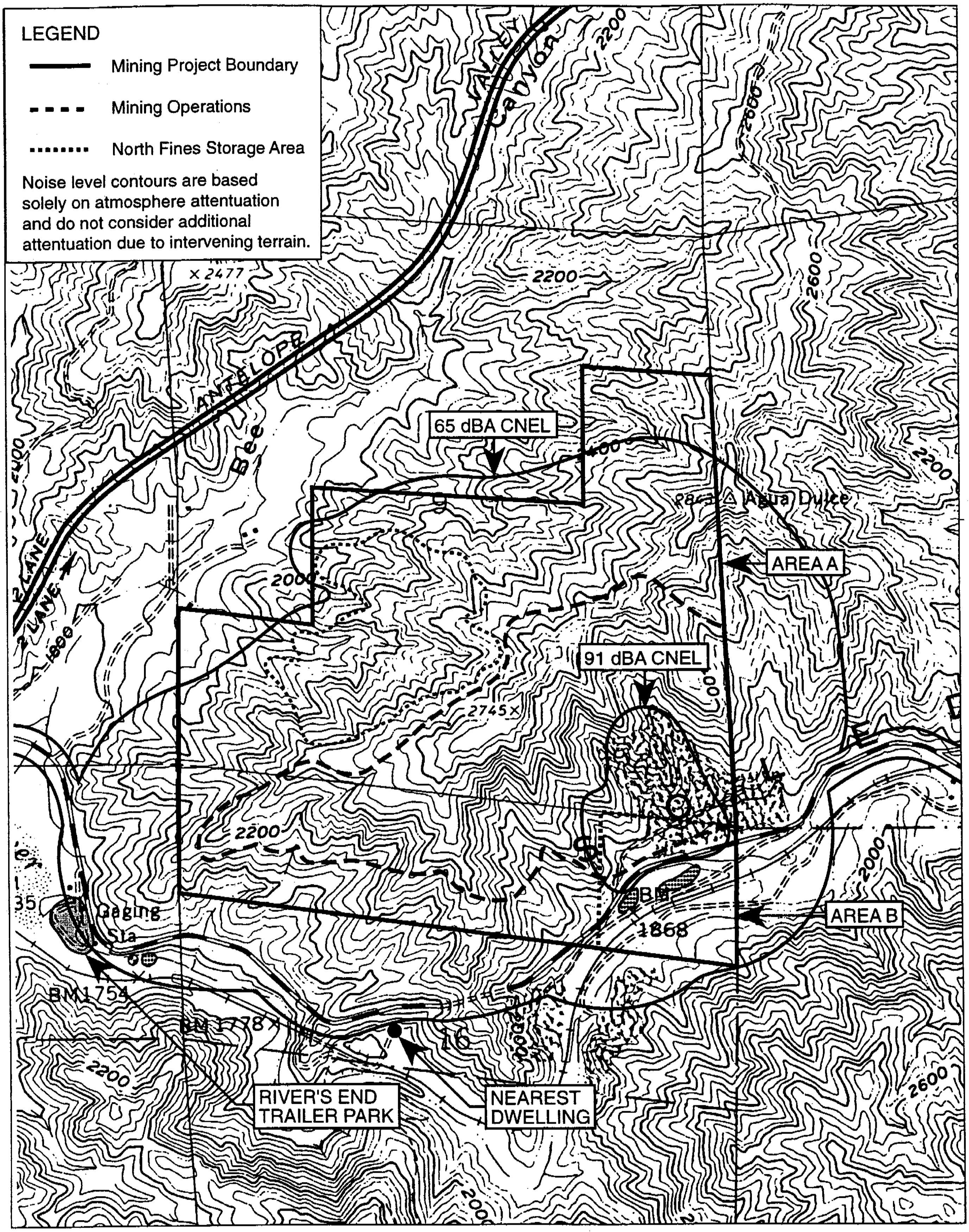



SOURCE: Environmental Solutions, 1992

**OPERATIONAL NOISE CONTOURS**

**Figure 3.1.5-4**




SOURCE: Environmental Solutions, 1992

**OPERATIONAL AND VEHICLE NOISE CONTOURS**

**Figure 3.1.5-5**

activity on the proposed project site, including the fines storage activity, is not projected to result in noise levels exceeding 65 CNEL at the Bee Canyon Mobile Home Park.

Potential distant receptors include the town of Agua Dulce. Considering atmospheric attenuation only, site operations could produce noise levels of about 41 dBA at the Town Center and 47 dBA at residences in the southwestern area of the town. However, noise generated at the TMC facility, nearly 4 miles away, will be attenuated by a number of factors. These include intervening topography, masking by other existing noises in the community, and other meteorological factors that are difficult to quantify.

For operations that would extend the typical operating day to 10:00 p.m., the 65 CNEL shown on Figure 3.1.5-5 may extend another 153 feet away from the site. Late night operations could extend the 65-CNEL contour shown on the figure by approximately 1,000 feet. It may be noted that contour distances are unattenuated and that the actual noise levels will be considerably lower due to attenuation by topography.

The Project is designed so that the majority of the excavation and site activity will occur on the south side of the site's major ridgeline. The primary aggregate processing operations, batch plant, and aggregate shipping operations will occur at an elevation of about 2,070, which is substantially below the 2,500-foot ridgeline (after excavation). This arrangement of facilities on the site will provide significant reduction in the predicted levels of noise generation at the Project site's northern boundary.

The topography between the Project site and Agua Dulce is highly variable, consisting of vegetated ridges and canyons ranging roughly between 1,800 and 2,800 feet in elevation. The existing topography will tend to break up and disperse the sound pressure waves generated at the Project site and will act as a berm to shield many potential receptors. Because a berm can attenuate noise by as much as 23 dBA, it is reasonable to assume that the additional attenuation due to the intervening ridge and undulating topography over the distance to Agua Dulce would be at least 20 dBA, in addition to atmospheric attenuation. This rationale provides the basis of the conclusion that the Project will not have a significant noise impact on the town of Agua Dulce.

**Aggregate Processing Facility and Batch Plant Operations**

To assess the noise produced by the plant operations, noise level measurements were obtained on September 16, 1992, at the TMC Azusa aggregate processing facility. Four measurements were made around the plant at a distance of 100 feet. The 10-minute Leq values ranged from 79.8 to 85.1 dBA with an average of 82.8 dBA. (Note that these readings were purposely obtained in the noisiest areas around the plant, and a true 100-foot average would be even lower than presented.) The loudest 10-minute Leq (85.1 dBA) was measured in proximity to the processing plant's rock crusher. Although haul trucks and miscellaneous equipment were operating simultaneously, that noise was indistinguishable from the noise produced by the facility except when the trucks or equipment passed directly between the meter and the plant.

Noise level readings were also obtained at the onsite ready-mixed concrete batch plant. The meter was located 100 feet from the batch plant on the opposite side from the rock plant. (The metered site was approximately 260 feet from the rock plant.) The noise of the batch plant was indistinguishable over the noise of the rock plant, even though the batch plant was between the rock plant and the meter. The only distinguishable noise from the batch plant was from the concrete trucks that rev up their engines while receiving their loads. Here, a 2.75-minute Leq of 80.8 dBA was recorded while a truck received a load of concrete. The same period produced an Leq of 72.8 dBA when no trucks were being loaded. Furthermore, as the trucks pulled into a tunnel to receive their loads, this noise was very directional and almost indiscernible off to the sides of the batch plant.

To further document the noise produced by the concrete batch plant, additional noise level readings were taken by Chambers Group at the City Concrete Stanton facility on October 14, 1992. As with the TMC Azusa plant, the concrete plant itself generates almost no noise, and the noise associated with operation of the facility is generated from the operation of concrete trucks. At the noisiest point, the trucks created an Leq of 84.9 dBA as measured at a distance of 50 feet when revving their engines while receiving their loads and during a subsequent washdown. (Note that this value is 4.1 dBA louder than measured at the TMC site. This difference is due [at least partially] to the fact that the City Concrete site is entirely paved and surrounded by block walls that reflect the noise to the meter.) The noise produced by the plant when no trucks were present was 69.1 dBA, also at a distance of 50 feet. However, even this value was elevated by a front-end loader idling approximately 100 feet from the meter. The loader, a Case W36, was monitored while moving aggregate and produced a noise level of 77.3 dBA as measured at a distance of about 75 feet. Based on an attenuation of 6 dBA per doubling of the distance, this value equates to 73.8 dBA at 100 feet.

In addition to noise generated as a result of the processing facility and batch plant, heavy equipment and truck noise is also associated with plant operations. A list of this anticipated heavy equipment is presented in Table 3.1.5-6. This mobile equipment will operate intermittently around the processing area. As evidenced at the TMC Azusa facility, operation of this equipment will be indistinguishable over the noise produced by processing operations and will not raise the CNEL predicted for processing operations. No impacts on sensitive receptors will result.

**Offsite Vehicle Travel**

Noise generation will also occur along any material haul routes and from employee commuting travel. Upon buildout of Phase 1, 15 employees and 347 trucks will access the site daily. With an estimated four trips per employee, this will yield a fully operational ADT of 754. These values will increase to 30 employees and 582 trucks (1,284 ADT) for Phase 2. During both phases, 95 percent of the trucks and 70 percent of the employee trips will be to the west along Soledad Canyon Road.

The traffic impact study (Appendix D) prepared by ATE indicates that use of Soledad Canyon Road will increase by approximately 1.5 percent per year. No projections are presented for the Antelope Valley Freeway; however, a similar rate is assumed for the purposes of this analysis.

**Table 3.1.5-6**
**CONSTRUCTION EQUIPMENT**
**INVOLVED IN PROCESSING PLANT ACTIVITIES**

| Type of Equipment | No. of Pieces |
|---|---|
| 9-cubic-yard wheeled loaders | 2 |
| Motor grader | 1 |
| 4,000-gallon water truck | 1 |
| Rough-terrain crane | 1 |
| 35-ton end dump truck (for tight access situations) | 1 |
| Street sweeper (for entrance road cleaning) | 1 |
| Bobcat loader | 1 |
| Miscellaneous service trucks and welders | 4 |
| Rough-terrain forklift | 1 |
| Portable light plant generator | 1 |

The truck trips for the existing and other related projects were added to this 1.5-percent-per-year growth factor.

For related mining projects, employee trips were assessed using a similar percentage of truck trips to employee vehicles as projected for Phase 1 of the Project. Table 3.1.5-7 presents the modeled noise levels with and without Project implementation for Soledad Canyon Road in 2000, the year of Phase 1 startup. (Because the project is not anticipated to use the full complement of trucks during the first full year of operation, 2000 was used to assess the worst-case impact. Subsequent years would have higher nonproject-related volumes of traffic on the road, and the Project would make a proportionately smaller contribution.) Note that because of the anticipated 1.5-percent-per-year increase in traffic and the addition of the existing mining operations, CNEL contours along Soledad Canyon Road are calculated to increase by 1 dBA over the value presented in Table 3.1.5-2. Also, notice that the noise level along Soledad Canyon Road could increase by as much as an additional 5-dBA CNEL because of Project implementation. This would present a significant impact for sensitive receptors along Soledad Canyon Road in the length of roadway between the site and the Antelope Valley Freeway to the west. These receptors are in proximity to the road and set at the grade of the road. (Differences in grade elevation tend to function in much the same way that a sound berm functions.)

Table 3.1.5-8 presents the distances to the various noise contours for Soledad Canyon Road. Note that Project implementation would extend the 65-dBA CNEL contour as much as 58 feet to a distance of 108 feet from the centerline of the road to the east of Lang Station Road.

The only current receptors that may be located within this distance are residents in the River's End Trailer Park. The nearest dwelling (the office) at the River's End Trailer Park is approximately 50 feet from the centerline of Soledad Canyon Road. If this office were level with the road, the anticipated noise at this location would be 70 dBA CNEL. Other trailers are situated at distances of approximately 75 to 300 feet. However, the trailer park is situated at a lower (approximately 25 to 55 feet) elevation than the roadway. The grade separation was

**Table 3.1.5-7**

**2000 TRAFFIC MIX AND CNEL CONTOURS FOR SOLEDAD CANYON ROAD WITHOUT AND WITH PROJECT IMPLEMENTATION[1]**

| Status | ADT | No. Autos | No. Med Trucks | No. Hvy Trucks | Avg Speed (mph) | CNEL (dBA) |
|---|---|---|---|---|---|---|
| Without Project | 3,346 | 3,195 | 77 | 74 | 45 | 65 |
| With Project | 4,100 | 3,255 | 77 | 768 | 45 | 70 |

[1] To the west of the project site. All values include 1.5-percent-per-year growth factor and related projects.

**Table 3.1.5-8**

**1994 DISTANCES TO THE 75-, 70-, 65-, AND 60-dBA CNEL FOR SOLEDAD CANYON ROAD[1]**

| Status | ADT | CNEL @ 50 feet (dBA) | Dist to 75-dBA CNEL (feet) | Dist to 70-dBA CNEL (feet) | Dist to 65-dBA CNEL (feet) | Dist to 60-dBA CNEL (feet) |
|---|---|---|---|---|---|---|
| Without Project | 3,346 | 65 | <50 | <50 | 50 | 108 |
| With Project | 4,100 | 70 | <50 | 50 | 108 | 232 |

[1] To the west of the project site.

modeled assuming that the grade represented a berm of 0 feet in height and the receptor was situated 25 feet below this barrier. The resultant modeled noise at 50 feet from the roadway was 12 dBA lower than if the roadway was at grade. With Project implementation, the resultant noise level at the River's End Trailer Park office would be approximately 58 dBA CNEL. Although this value is below the 65-dBA CNEL as specified in the local noise ordinance, it represents an increase of 5 dBA and thus will be clearly audible to the local receptors. Thus, a significant impact is projected (see Mitigation Measure N3).

A second area of concern is along Agua Dulce Road. A small volume of the Project's traffic would access this route (35 ADT for trucks and 12 ADT for employee trips). However, based on a total ADT of 2,250, the Project's noise contribution along this road will not present a significant impact.

Finally, raising the noise level along the Antelope Valley Freeway by 3 dBA would require a doubling of the current traffic volume. Because the Project represents less than 2 percent of the freeway volume, no impacts are projected along this route.

By Phase 2, beginning in 2008, the traffic along the site access routes will increase because of areal growth and as a result of cumulative projects within the general area. Based on the traffic analysis prepared by ATE, the anticipated traffic is as presented in Table 3.1.5-9. To this volume, the Project will add as many as 1,164 heavy trucks and 120 employee trips. The greatest portion of this Project-generated traffic would again be along Soledad Canyon Road. Based on 95 percent of the truck trips and 70 percent of the employee trips taking place between the site and Antelope Valley Freeway along Soledad Canyon Road, an additional 1,106 truck trips and 84 employee trips would be expected. Table 3.1.5-9 also includes the projected Phase 2 traffic for a comparison of the Project's noise contribution. Table 3.1.5-10 presents the distances to the various noise contours for Soledad Canyon Road. Note that Project implementation would raise the noise level by 6 dBA and extend the 65-dBA CNEL contours as much as 88 feet. Again, the only current receptors located within these distances are residents in the River's End Trailer Park. However, the modeled 12-dBA attenuation provided by the grade separation would reduce the noise at the nearest receptors at the trailer park to a level of 60 dBA CNEL. Still, this 5-dBA increase represents a significant impact.

Based on a projected volume of 5,000 ADT, the small volume of Project traffic that will access Agua Dulce Road (58 ADT for trucks and 24 ADT for employee trips) will not present a significant impact.

As with Phase 1, raising the noise along the Antelope Valley Freeway by 3 dBA would require a doubling of the future traffic volume. Because the Project represents less than 2 percent of the freeway volume, no impacts are projected along this route.

**Summary**

Site noise, when logarithmically summed with that from heavy equipment operations involved in excavation (87 dBA Leq at 100 feet), the rock plant (85 dBA Leq at 100 feet), and the concrete batch plant (79 dBA Leq at 100 feet), will have a source strength of 90 dBA Leq at 100 feet. However, this noise will not all be produced in one area. Vehicle travel will add to this noise but will not be concentrated at the site. Noise contours from both onsite operations and vehicle traffic along Soledad Canyon Road west of the Project are illustrated on Figure 3.1.5-5.

As mentioned, the distance to the receptor on Capra Road is approximately ¼ mile from the center of the southern site boundary. Although the River's End Trailer Park is located only about 1,000 feet from the nearest site boundary, it is approximately 1 mile from the processing area and would not be subject to processing and loading noise. From the nearest point of the processing area, the receptor on Capra Road is approximately 3,000 feet. Thus, the noise exposure to nearby receptors is based on excavation activities located at a distance of 1,320 feet and all other operations located at a distance of 3,000 feet. The noise from onsite operations at this receptor site is calculated at 65 dBA Leq and 66 dBA CNEL (atmospheric attenuation only). Though it is difficult to calculate the additional attenuation occurring from the complex terrain of the area, it is estimated that the additional sound attenuation due to intervening terrain would be at least 5 dBA Leq. (The sound attenuation due to a 10-foot noise wall in this instance would be at least 5 dBA.) Consequently, it is reliably estimated that resulting CNEL would be well below the 65 CNEL criterion but may exceed the 5-dBA above-ambient criterion. Based on the latter criterion the noise impact is considered significant during excavation of Cut 3.

## Table 3.1.5-9

## 2008 TRAFFIC MIX AND CNEL FOR SOLEDAD CANYON ROAD WITHOUT AND WITH PROJECT IMPLEMENTATION[1]

| Status | ADT | No. Autos | No. Med Trucks | No. Hvy Trucks | Avg Speed (mph) | CNEL (dBA) |
|---|---|---|---|---|---|---|
| Without Project | 4,610 | 4,432 | 91 | 87 | 45 | 66 |
| With Project | 5,800 | 4,516 | 91 | 1,193 | 45 | 72 |
| [1] To the west of the project site. All values include 1.5-percent-per-year growth factor and related projects. | | | | | | |

## Table 3.1.5-10

## 2008 DISTANCES TO THE 75-, 70-, 65-, AND 60-dBA CNEL FOR SOLEDAD CANYON ROAD[1]

| Status | ADT | CNEL @ 50 feet (dBA) | Dist to 75-dBA CNEL (feet) | Dist to 70-dBA CNEL (feet) | Dist to 65-dBA CNEL (feet) | Dist to 60-dBA CNEL (feet) |
|---|---|---|---|---|---|---|
| Without Project | 4,636 | 66 | <50 | <50 | 58 | 126 |
| With Project | 5,841 | 72 | <50 | 68 | 146 | 315 |
| [1] To the west of the project site. | | | | | | |

As discussed in the impact section, a portion of the proposed Bee Canyon Mobile Home Park intersects the projected 65-dBA CNEL operations noise contour of the Project. If the Bee Canyon Mobile Home Park is constructed, approximately 72 lots could experience noise levels exceeding 65 dBA CNEL during excavation of Cut 3. This is considered a potentially significant impact.

Potential noise impacts on the River's End Trailer Park due to Project offsite vehicle travel along Soledad Canyon Road will result. While the County noise standards will not be exceeded, the increase in ambient noise may increase by 5 dBA and, if so, will be clearly discernible to local receptors. If the Bee Canyon Mobile Home Park is approved and constructed, two lots could be within the 65-dBA CNEL contour of traffic on Soledad Canyon Road.

Based on atmospheric attenuation and the effects of intervening topography, noise from Project construction and operations will not exceed significance criteria at potential receptors in and around the town of Agua Dulce.

### 3.1.5.3 Mitigation Measures

Onsite Measures

The potentially significant impacts related to blasting operations required to loosen the conglomerate rock formations will be mitigated as follows:

N1. The Applicant will conduct blasting operations in general conformance with the federal OSMRE regulations as stated in 30 CFR, Chapter VII, Sections 816.61 through 816.68, and other applicable regulations. Conformance shall be demonstrated by preparing a detailed Blasting Plan identifying project compliance with the stated requirements (as minimum standards) and monitoring of blasting activities. The Blasting Plan shall be reviewed and approved by the County prior to conducting any blasting onsite. The Blasting Plan shall provide the following:

a. Submission and approval by the County of the specific blast design prior to blasting, where such blasting will occur within 1,000 feet of habitable buildings outside of the permit area.

b. Conducting a public awareness program including notification of all residents within ½ mile of any part of the permit area of the opportunity to request a preblast survey. The notification is to be done at least 30 days prior to initiation of blasting. A TMC information officer who can be contacted by telephone for information will be designated.

c. Publication of the anticipated blasting schedule at least 10 days prior to the beginning of the blasting program via a newspaper of general circulation in the Project area and by direct mail to residents within ½ mile, and republishing at least every 12 months or whenever substantive changes to the schedule are to be implemented.

d. Placement of warning signs and access controls to blast areas.

e. Incorporation of the provision that blasting shall be conducted to prevent injury to persons, damage to public or private property outside the permit area, adverse impacts on any underground mine, and change in course, channel, or availability of surface or groundwater outside of the permit area.

f. Conducting blasting so that the maximum air overpressure shall not exceed 133 dB (2-Hz minimum) measured directly between the nearest occupied residence and the blast site (ref. U.S. Bureau of Mines Report of Investigations 8485 (1980) "Structure Response and Damage Produced by Airblast from Surface Mining").

g. Conducting blasting so that the peak particle velocity generated from any blast shall not exceed 0.5 in/sec for vibration frequencies below 40 Hz and 2.0 in/sec for vibration frequencies of 40 Hz or more, measured directly between the nearest residence and the blast site (U.S. Bureau of Mines 1980b). Other methods of determining acceptable particle vibration, such as the use of scaled-distance equations, shall be allowed subject to approval by the County.

h. Conducting periodic monitoring offsite to ensure compliance with airblast and vibration standards and providing a seismograph record of each blast. Monitoring shall be conducted at a representative residential receptor and at a representative location adjacent to Santa Clara River riparian habitat.

i. Controlling flyrock at the blast site in accordance with OSMRE regulations. That is, flyrock traveling in the air or along the ground shall not be cast from the blasting site.

j. Maintain records as specified by the County of all blasts for a minimum 3-year period.

k. Identification of conditions when blasting will be curtailed including atmospheric conditions that are conducive to transmission and amplification of noise offsite, and/or conditions conducive to the transport of high levels of fugitive dust emissions offsite. The Blasting Plan will identify such conditions where blasting is to be curtailed by the Applicant. The program shall also specify the candidate control measures specifically aimed at reducing blasting fugitive emissions.

l. Identification of other parameters affecting blasting such as the regulatory requirement that blasting be conducted during daylight hours. Blasting shall be prohibited on Sundays and specified holidays.

m. Implementing specific measures to prevent nitrate contamination of surface and groundwater due to use of ANFO.

Noise impacts will be mitigated as follows:

N2. Based on the proposed lot configurations of the proposed Bee Canyon Mobile Home Park, trailers located west of the westernmost boundary of the TMC Project may be subject to significant noise during Cut 3 operations. If the Bee Canyon Mobile Home Park is constructed, the noise impact will be reduced to less than significant by constructing berms or cut slopes to shield lots from direct noise exposure as confirmed through acoustic evaluation (based on final grading contours of the Bee Canyon project). It is anticipated that these measures would be applicable only if the Bee Canyon Mobile Home Park were actually constructed. If a soundwall is to be constructed, a detailed study will be conducted by qualified personnel in the fields of structural engineering, environmental noise assessment, and architectural acoustics.

Offsite Measures

A significant impact has been identified because of Project vehicle-generated noise at the River's End Trailer Park. In accordance with the noise model, the grade separation should provide an attenuation of 12 dBA, and this would reduce the noise generated along Soledad Canyon Road to a level less than specified by the noise ordinance. However, an increase of 5 dBA CNEL is predicted and will be clearly audible to the residents in the park. At the proposed Bee Canyon Mobile Home Park, two lots are potentially within the 65-dBA CNEL contour of Soledad Canyon Road.

N3. At the River's End Trailer Park and the Bee Canyon Mobile Home Park, if constructed, soundwalls or berms will be constructed adjacent to affected lots to mitigate offsite truck transportation noise.

If a soundwall is constructed, its placement and dimensions will depend on the materials used, the height differential between the roadway and the receptors, the grade and curvature of the road next to the receptors, and the actual positions of the receptors at the bottom of the slope. Prior to wall construction, a more thorough study will be conducted by qualified personnel in the fields of structural engineering, environmental noise assessment, and architectural acoustics.

Another means of reducing truck-generated noise at the River's End Trailer Park would be to reroute haul trucks along Agua Dulce Road. This mitigation was rejected for the reasons presented below.

Haul trucks proceeding along Agua Dulce Road would create a noise level roughly equivalent to that predicted along Soledad Canyon Road. Several residents located along Agua Dulce Road are situated at the same elevation or higher than the road with a clear view of the road. Furthermore, several of these residents are located closer to the road than those situated in the trailer park. Finally, because the hills rise on either side of the road, the noise is contained in an "amphitheater-like setting." This can reflect noise to the receptors, thus elevating noise levels by as much as 3 dBA above that predicted by the noise model. This being the case, these residents would most certainly experience an increase in the ambient noise level that would exceed the 5-dBA criterion as well as the 65-dBA County ordinance level.

Due to the grade separation, residents at the River's End Trailer Park would need a relatively low soundwall to block their line of sight and mitigate vehicle-generated noise. Residents located along Agua Dulce Road are situated higher than the road and would need a much higher wall to block the line of sight and vehicle-generated noise.

Furthermore, the residents at the trailer park are clustered together at a bend in the road and would require a relatively short wall (in length) to provide the necessary attenuation. Along Agua Dulce Road the residents are scattered, thus necessitating construction of a separate wall for each impacted dwelling.

### 3.1.5.4 Unavoidable Significant Adverse Effects

The measures proposed above can be feasibly implemented and will reduce the identified impacts to a less-than-significant level. No potential significant unavoidable adverse impacts will remain after mitigation.