

APPENDIX F

**SOUND LEVEL READINGS FROM THE
METROLINK MAINTENANCE FACILITY FOR
PROPOSED SCAQMD RULES 3501 AND 3502**

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Prepared for:

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INTRODUCTION

Noise level testing was performed at the Metrolink Maintenance Facility located at 1555 San Fernando Road in Los Angeles on November 3rd and November 8th, 2005. The noise readings were taken by field technicians representing Environmental Audit, Inc. (EAI), an independent consulting firm, operating under the direction of the South Coast Air Quality Management District (SCAQMD). Readings were taken to record sound levels of specific locomotive engines, as well as sound levels at various locations within the maintenance facility.

SCOPE OF WORK

EAI took noise readings in conjunction with emissions testing of locomotive engines being conducted at the maintenance facility. The purpose of the noise tests was to determine the noise levels generated by locomotive engines during cold start-ups, during start-ups when the engine has been shutdown for a short period of time, and during engine idling. EAI performed the following scope of work to complete the analysis required:

- Take noise readings during emission monitoring of two different locomotive engines.
- Take noise readings during the start up of each engine under various conditions.
- Take noise readings at increasing distances from the engine to determine the actual noise attenuation with distance.
- Prepare a brief report that summarizes the noise monitoring and provides the monitoring data.

Two technicians performed noise sampling in order to take simultaneous instantaneous noise readings at different distances from the locomotive engines. Noise level measurements were taken using a precision sound meter, as specified by the American National Standards Institute Specifications (ANSI) S1.4, "Specification for Sound Level Meters." Sound measurements were taken in accordance with ANSI S1.13, "Methods for Measurement of Sound Pressure Levels," and the latest version of the American Society of Testing and Materials (ASTM) E 1014, Measurement of Outdoor A-Weighted Sound Levels.

FACILITY OVERVIEW

The Metrolink Maintenance Facility lies between San Fernando Road in Los Angeles, and the Los Angeles River. Only the Metrolink Maintenance Facility lies west of San Fernando Road and east of the river. To the east of San Fernando Road, there are primarily businesses (light industrial) fronting San Fernando Road, with residential areas behind (east of) the businesses. The nearest receptor to the east of the maintenance

facility test area is AAA Trailer Home Estates (approximately 100 yards), which was the only residential area with frontage on San Fernando Road.

West of the Metrolink Maintenance Facility is the Los Angeles River. Only the Metrolink Maintenance Facility lies east of the river. Located west of the Los Angeles River, and east of Interstate 5, is a residential area. The nearest residence west of the maintenance facility test area is at a distance of at least 300 yards.

SAMPLING ACTIVITIES

Sound readings were taken on engine nos. 804 and 887 on November 3, 2005, and again on engine no. 804 on November 8, 2005. The first readings on engine no. 804 were taken while a sheet metal shroud was attached to the exhaust stack as part of emissions testing. The first readings on engine no. 887, and the second readings on engine no. 804, were completed with no attachments to either stack. Tables 1 and 2 give site and equipment specifications for the engines tested. Noise readings were taken at distances from the engine of six, 12, 50 and 100 ft. Additionally, several readings were taken at various locations throughout the yard. Attachments A, B and C provide the data collected. A majority of the readings came from engine no. 804. Due to circumstances with yard operations and emissions testing, three readings from engine no. 887 were taken.

TABLE 1

Site and Equipment Specs for Engine # 804

Approximate Size of Maintenance Area:	100 yards wide by 300 yards long
Distance to the Nearest/Type Receptor:	100 yards /AAA Trailer Home Estates
Location Conditions:	Facility lies parallel to LA River and I-5 Frwy.
Engine # 804 Manufacturer/Type/Age:	EMD 16-710 G3A/Diesel Electric/?
HP of the Locomotive Engine:	3800
Any other Engine Specifications:	S/N# 86H110011

TABLE 2

Site and Equipment Specs for Engine # 887

Approximate Size of Maintenance Area:	100 yards wide by 300 yards long
Distance to the Nearest/Type Receptor:	100 yards / AAA Trailer Home Estates
Location Conditions:	Facility lies parallel to LA River and I-5 Frwy.
Engine # 887 Manufacturer/Type/Age:	EMD/Diesel Electric/2001
HP of the Locomotive Engine:	3000
Any other Engine Specifications:	S/N# O1H11017

SUMMARY OF NOISE LEVELS

As noted in Table 3, the average noise levels detected during the cold start of a locomotive (66.5 dBA), high idle of the locomotive (68 dBA), and regular idle of the locomotive (65 dBA) were all below a 70 dBA level at 100 feet. Assuming the industry standard of six dBA noise attenuation (reduction) for every doubling distance, noise levels associated with the locomotive engines would be reduced to 65 dBA or less at about 150 feet from the sources.

TABLE 3

SUMMARY OF NOISE READINGS

Distance from Engine (feet)	Noise Level – Cold Start (dBA)	Noise Level – High Idle (dBA)	Noise Level – Regular Idle (dBA)
50 ⁽¹⁾	71.1	72.8	69.5
100 ⁽¹⁾	66.5	68	65
150 ⁽²⁾	63.5	65	62
200 ⁽²⁾	60.5	62	59

(1) Averaged from all noise readings taken under the given condition; however, the high noise readings during high idle for Engine No. 804 were eliminated as the emissions shroud appears to increase noise levels during high idle conditions (74-80 dBA).

(2) A six dBA noise attenuation was assumed for every doubling distance.

APPLICABLE NOISE ORDINANCES

Table 4 provides a list of the railyards that could be affected by SCAQMD proposed Rules 3501 and 3502. Table 5 lists the cities and/or counties where noise ordinances are not available. City and county websites, as well as municipal and county codes, were reviewed, and when no noise ordinances were available, phone contact was made. All cities and counties have restrictions regarding noise, but not all list specific allowable dBA levels. These restrictions are noted in Table 5. Where no city noise ordinance applies, the county noise ordinance is assumed to apply (where available).

Tables 6 – 14 show the noise ordinances for cities and counties with railyards located in them.

TABLE 4

Locations of Railyards

Railyards	Location of Railyard	Applicable Noise Ordinance*
City of Industry Yard	17225 Arenth St., City of Industry, CA 91748	Table 5, 14
Colton Yard	19100 Slover Ave., Bloomington, CA 92316	Table 5
Commerce Diesel Maintenance Facility	6300 Sheila Ave., Commerce, CA 90040	Table 13
Commerce Eastern Intermodal Facility	2818 Eastern Ave., Commerce, CA 90040	Table 13
Commerce Intermodal Facility	4341 E. Washington Blvd., Commerce, CA 90023	Table 13
Dolores Yard	2442 Carson St., Carson, CA 90810	Table 7
Intermodal Container Transfer Facility	2401 Sepulveda Blvd, Long Beach, CA 90810	Table 8
La Mirada Yard	14503 Macaw St., La Mirada, CA 90638	Table 5, 14
Los Angeles Intermodal Facility	3770 Washington Blvd, Commerce, CA 90023	Table 13
Los Angeles Junction Railway	4433 Exchange Ave, Los Angeles, CA 90058	Table 9
Los Angeles Transportation Center Intermodal Facility	750 Lamar St., Los Angeles, CA 90031	Table 9
Meade Yard	2402 Anaheim St., Wilmington, CA 90744	Table 10
Mira Loma Auto Distribution Facility	4500 Etiwanda Ave., Mira Loma, CA 91752	Table 11
Montclair Yard	10773 Central Place, Montclair, CA 91763	Table 12
Pacific Harbor Lines	340 W. Water St., Wilmington, CA 90744	Table 9
Pico Rivera Yard	7427 Rosemead Blvd, Pico Rivera, CA 90660	Table 5, 14
San Bernardino Yard	1535 W. 4 th St., San Bernardino, CA 92411	Table 11
Watson Yard	1302 Lomita Blvd. Wilmington, CA 90744	Table 9
Anaheim Yard	200 S. Adams St., Anaheim, CA 90802	Table 6
Metrolink Maintenance Yard	1555 San Fernando Rd., Los Angeles, CA 90065	Table 9

* The table where the noise ordinance is located applicable to each facility is identified in the column.

TABLE 5

Cities and County with No Noise Ordinances Available

City/County	Action	Status
City of Industry	Contacted Planner (Troy Helling)	No ordinance for Industrial areas. As part of the municipal code for business licensed and regulations, there is a rule regarding dances and dance halls. No ordinance exists stating noise thresholds in dBAs. The Los Angeles County noise ordinance is assumed to apply.
Bloomington, CA	Left many messages with County (San Bernardino) Planning (Lorreta Matthews), but no response to requests.	Bloomington is a small area in San Bernardino County. County Code has no ordinance stating noise thresholds in dBAs.
La Mirada, CA	Contacted by phone	Code of ordinances, under Public Peace, morals and Safety, discusses Noise – Disorderly Conduct. No ordinance exists stating noise thresholds in dBAs. The Los Angeles County noise ordinance is assumed to apply.
Pico Rivera, CA	Contacted by phone	No specific rules exist. Noise issues are dealt with by city council. The Los Angeles County noise ordinance is assumed to apply.

TABLE 6

City Of Anaheim Noise Ordinance

Activity Category	Description of Activity Category	Design Noise Levels ¹	
		L _{eq} (dBA)	L ₁₀ (dBA)
A	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose. Examples include natural parks or wildlife habitat.	57 (exterior)	60 (exterior)
B	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.	67 (exterior)	70 (exterior)
C	Developed lands, properties, or activities not included in Categories A or B above.	72 (exterior)	75 (exterior)
D	Undeveloped lands.	---	---
E	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.	52 (interior)	55 (interior)

Source: City of Anaheim General Plan, May 2004

¹ Either L_{eq} or L₁₀ (but not both) design noise levels may be used on a project.

TABLE 7

City Of Carson Noise Ordinance Thresholds

Duration	Symbol	Industrial* Limit (dBA)	Residential Limit (dBA)	Residential Limit (dBA)
		Nighttime (10pm – 7am)	Daytime (7am – 10pm)	Nighttime (10pm – 7am)
15 minutes in any half hour	L ₅₀	70	50	45
7.55 minutes in any half hour	L ₂₅	75	55	50
2.55 minutes in any half hour	L ₈	80	60	55
30 seconds in any half hour	L ₂	85	65	60
Anytime in any half hour	L _{max}	90	70	65

* City of Carson Ordinance No. 4101

TABLE 8

City Of Long Beach, Exterior Noise Limits

Receiving Land Use District*	Time Period	Noise Level** (dBA)
Nighttime		
District One	10:00 PM – 7:00 am	45
District Two	10:00 PM – 7:00 am	55
District Three	10:00 PM – 7:00 am	65
District Four	10:00 PM – 7:00 am	70
District Five	10:00 PM – 7:00 am	***
Daytime		
District One	7:00 am - 10:00 PM	50
District Two	7:00 am - 10:00 PM	60
District Three	7:00 am - 10:00 PM	65
District Four	7:00 am - 10:00 PM	70
District Five	7:00 am - 10:00 PM	***
*District One:	Predominantly residential with other land use types also present.	
District Two:	Predominantly commercial with other land use types also present.	
Districts Three and Four:	Predominantly industrial with other land types use also present.	
District Five:	Airport, Freeways and waterways regulated by other agencies.	

Source: City of Long Beach, Municipal Code, Title 8, Chapter 8.80

* Noise at Long Beach Airport is Regulated by state and federal laws

** Districts Three and Four limits are industrial and noise levels are intended primarily for use at their boundaries rather than for noise control within those districts.

*** Regulated by other agencies and laws.

TABLE 9

City Of Los Angeles Noise Limits

ZONE	Daytime dBA	Nighttime dBA
Residential Zones	50	40
P, PB, CR, C1, C2, C4, C5, CM (commercial and public zones)	60	55
M1, MR1, MR2 (industrial/manufacturing zones)	65	65
M2, M3 (heavy industrial zones)	70	70

Source: City of Los Angeles Noise Ordinances Nos. 1156,363 and 11574

TABLE 10

County Of Riverside Noise Limits

Hours	Interior Standards	Exterior Standards
10:00 PM – 7:00 am	40 L_{eq} (10 minute)	45 L_{eq} (10 minute)
7:00 am – 10:00 PM	50 L_{eq} (10 minute)	65 L_{eq} (10 minute)

Source: County of Riverside, Noise Ordinance No. 847

TABLE 11

City Of San Bernardino Noise Limits

Activity Category	Description of Activity Category	Design Noise Levels¹	
		L_{eq} (dBA)	L_{10} (dBA)
A	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.	57 (exterior)	60 (exterior)
B	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.	67 (exterior)	70 (exterior)
C	Developed lands, properties, or activities not included in Categories A or B, above.	72 (exterior)	75 (exterior)
D	Undeveloped lands.	--	--
E	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.	52 (interior)	55 (interior)

¹ Either L_{eq} or L_{10} (but not both) design noise levels may be used on a project.

TABLE 12

City Of Montclair Noise Limits

Zone	Time	Decibels
Daytime		
Residential	7:00 am – 10:00 PM	55 dBA
Commercial	7:00 am – 10:00 PM	65 dBA
Industrial	7:00 am – 10:00 PM	70 dBA
Nighttime		
Residential	10:00 PM – 7:00 am	45 dBA
Commercial	10:00 PM – 7:00 am	55 dBA
Industrial	10:00 PM – 7:00 am	60 dBA

Source: City of Montclair, Municipal Code 6.12.040

TABLE 13

City Of Commerce Noise Limits

Zone	Time	Allowable Noise Level
Daytime		
Residential	7:00 am – 7 PM	55
Commercial	7:00 am – 10 PM	65
Evening		
Residential	7:00 PM – 10:00 PM	50
Nighttime		
Residential	10:00 PM – 7:00 am	45
Commercial	10:00 PM – 7:00 am	55
Industrial	Anytime	70

Source: City of Commerce, March 2000, Zoning Ordinance, Chapter 19.1

TABLE 14

County Of Los Angeles Noise Limits

Day-Night Average Exterior Sound Level (CNEL dBA)		
Designated Noise Zone Land Use	Time Interval	Exterior Noise Level
Daytime		
Residential Properties	7:00 am – 10:00 PM	50 dBA
Commercial Properties	7:00 am – 10:00 PM	60 dBA
Nighttime		
Residential Properties	10:00 PM – 7:00 am	45 dBA
Commercial Properties	10:00 PM – 7:00 am	55 dBA
Noise Sensitive Area	Anytime	45 dBA
Industrial Area	Anytime	70 dBA

Source: Los Angeles County Codes, Title 2, Chapter 12, 1978

COMPARISON TO NOISE ORDINANCES

Railyards are generally located within areas that are zoned for industrial uses. The acceptable noise level in industrial areas is 70 decibels (dBA) for all industrial areas, except the County of Riverside which is 65 dBA. As previously noted in Table 3, the average noise levels during cold start of a locomotive (66.5 dBA), high idle of the locomotive (68 dBA), and regular idle of the locomotive (65 dBA) were all below the 70 dBA level at 100 feet. Assuming a six dBA noise attenuation for every doubling distance, noise levels associated with the locomotive engines would be reduced to 65 dBA or less at about 150 feet from the sources.

ATTACHMENT A

NOISE READINGS FOR # 804 WITH SHROUD

THURSDAY, NOVEMBER 3, 2005

(Locomotive # 804; with sheet metal shroud (approx. 18" H X 48" W X 80" H) mounted to exhaust)

Activity	Time	Db level at 6 ft	Time	Db level at 12 ft	Time	Db level at 50 ft	Time	Db level at 100 ft	Noted Conditions (temps; wind direction; unusual loud interference; passing train)
Cold Start	8:02	85.1	8:02	83.4	8:02	70.8	8:02	65.2	65 degrees with light to no wind
High Idle	8:12	85.8	8:02	85.8	8:02	79.6	8:02	74.5	65 degrees with light to no wind
High Idle	8:22	85.8	8:02	84.8	8:02	79.5	8:02	74.7	65 degrees with light to no wind
Regular Idle	8:32	76.7	8:02	74.5	8:02	70.0	8:02	66.8	65 degrees with light to no wind
Regular Idle	8:42	76.6	8:02	74.8	8:02	69.0	8:02	63.4	65 degrees with light to no wind
Regular Idle	8:52	76.4	8:02	74.7	8:02	70.5	8:02	62.9	65 degrees with light to no wind
Regular Idle	9:02	76.3	9:02	73.9	9:02	67.5	9:02	63.6	65 degrees with light to no wind
High Idle	9:05	90.6	9:05	90.9	9:05	84.7	9:05	80.54	65 degrees with light to no wind
Regular Idle	9:45	78.0	9:45	75.6	9:45	71.1	9:45	66.2	65 degrees with light to no wind
High Idle	9:57	86.2	9:57	85.8	9:57	77.6	9:57	75.4	65 degrees with light to no wind
Location of Reading: Capture existing yard noise conditions w/no locomotive engine	Db level								
Maintenance Test Area	59.1								65 degrees with light to no wind

Location of Reading: Noise levels at site/boundary – note distance to locomotive/receptor	DbA level								
200' east of #804 (100' from AAA Trailer Home Estates). Regular Idle	62.4								65 degrees with light to no wind
200' east of #804 (100' from AAA Trailer Home Estates). High Idle	70.6								65 degrees with light to no wind
200' east of #804 (100' from AAA Trailer Home Estates). High Idle w/train passing on main line	75.2								65 degrees with light to no wind
75' east of #804 (225' from AAA Trailer Home Estates). High Idle w/train passing on main line	80.0								65 degrees with light to no wind
125' west of #804 (270 yards from residential area west of river). High Idle	66.1								65 degrees with light to no wind
125' west of #804 (270 yards from residential area west of river). High Idle with train passing in maintenance yard.	77.1								65 degrees with light to no wind
125' west of #804 (270 yards from residential area west of river). High Idle with train passing in maintenance yard with bell ringing.	83.2								65 degrees with light to no wind

ATTACHMENT B

NOISE READINGS FOR # 887

THURSDAY, NOVEMBER 3, 2005

(Locomotive # 887)

Activity	Time	Db level at 6 ft	Time	Db level at 12 ft	Time	Db level at 50 ft	Time	Db level at 100 ft	Noted Conditions (temps; wind direction; unusual loud interference; passing train)
Start	11:11	81.2	11:11	79.5	11:11	71.7	11:11	68.1	65 degrees with light to no wind
High Idle	11:15	80.3	11:15	79.0	11:15	74.0	11:15	66.5	65 degrees with light to no wind
Regular Idle	11:24	76.1	11:24	72.3	11:24	68.1	11:24	65.8	65 degrees with light to no wind

ATTACHMENT C

NOISE READINGS FOR # 804

TUESDAY, NOVEMBER 8, 2005

(Locomotive # 804; with sheet metal shroud (approx. 18" H X 48" W X 80" H) mounted to exhaust)

Activity	Time	DbA level at 6 ft	Time	DbA level at 12 ft	Time	DbA level at 50 ft	Time	DbA level at 100 ft	Noted Conditions (temps; wind direction; unusual loud interference; passing train)
Cold Start	12:40	86.2	12:40	79.0	12:40	70.9	12:40	66.5	65 degrees with light to no wind
High Idle	12:45	84.7	12:45	81.5	12:45	73.1	12:45	71.2	65 degrees with light to no wind
High Idle	12:50	82.1	12:50	79.3	12:50	72.7	12:50	67.9	65 degrees with light to no wind
High Idle	13:00	81.3	13:00	78.2	13:00	72.4	13:00	67.6	65 degrees with light to no wind
High Idle	13:10	81.4	13:10	78.1	13:10	72.3	13:10	67.3	65 degrees with light to no wind
High Idle with #800 directly in front of #804 running at high idle	13:15	81.3	13:15	N/R ¹	13:15	75.1	13:15	N/R	65 degrees with light to no wind
Hot Re-start	1:46	84.3	1:46	79.3 ⁸	1:46	72.4	1:46	68.0 ²	65 degrees with light to no wind
High Idle	1:56	82.4	1:56	79.0	1:56	72.7	1:56	72.9 ²	65 degrees with light to no wind
High Idle	2:06	81.9	2:06	78.5	2:06	72.7	2:06	70.8 ²	65 degrees with light to no wind
Regular Idle	2:10	78.2	2:10	75.9	2:10	68.9	2:10	67.2 ²	65 degrees with light to no wind
Regular Idle	2:16	77.6	2:16	73.0	2:16	71.0	2:16	N/R	65 degrees with light to no wind
Location of Reading: Capture existing yard noise conditions w/no locomotive engine	DbA level								
150' east of #804 (150' from AAA Trailer Home Estates). Regular Idle	66.5								
6' from #804 with engine at high idle; air relief valve opened	107.4								

¹ N/R No reading taken at this time

² A train arrived on track and parked preventing access to 100 ft. distance from #804. Readings were taken at 85 ft. with a train parked directly behind.