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Final Report
Project No. 01023

Chevron Products Company
CARB Phase 3 Clean Fuels Project
Environmental Noise Survey

Submitted to
Chevron Products Company
324 West El Segundo Blvd., El Segundo, CA 90245
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I. Introduction

This report documents the results of environmental noise surveys conducted in and around the Chevron El Segundo Refinery between July 1999 and January 2001. The noise data will be used in the preparation of the CARB Phase 3 Clean Fuels Project noise impact assessment(1).

The reported data was collected by Navcon Engineering during three measurement surveys: **1)** South Side Noise Survey (conducted in January of 2001), **2)** Manhattan Beach Noise Survey (conducted in July of 1999) and **3)** El Segundo Noise Survey (conducted in December of 2000). The measurement surveys are described in **Section II, Measurement Surveys & Instrumentation**.

The noise data was reduced and is presented in terms of the statistical descriptors specified in the City of Manhattan Beach Noise Ordinance, the City of El Segundo Noise Ordinance and measures requested by ENSR International. The statistical descriptors are described in **Section III, Data Presentation**.

The project compact disk (CD) which accompanies this report includes the raw measurement data, photographs of the measurement locations and a PDF version of this report.

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(1) ***Background -*** *Under an executive order from Governor Gray Davis, gasoline produced for sale in California may not be blended with methyl-tertiary-butyl-ether (MTBE) after December 31, 2002. Since California gasoline is still required to contain an oxygenated compound by federal requirements, refiners in California will reformulate their gasoline so that it can be blended with ethanol instead of MTBE. In general, this will require a reduction in the sulfur content and volatility (vapor pressure) of the Refinery's overall gasoline pool. The specific requirements are described in regulations adopted by the California Air Resources Board (CARB).*

In conformance with CARB regulations, Chevron will install new equipment and processes at the El Segundo refinery. Prior to being issued construction permits, Chevron must submit an EIR to the Air Quality Management District which addresses all potential environmental impacts, including noise.

It is anticipated that the noise impact assessment and the Environmental Impact Report will be completed during the 1st quarter of 2001. The CARB Phase 3 construction is expected to begin early in 2002 and should be completed by November 2002.

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II. Measurement Surveys & Instrumentation

II.1 South Side Noise Survey (January 5th - 18th, 2001)

The South Side Noise Survey was conducted between January 5th & 18th, 2001. The data was collected specifically for the CARB Phase 3 noise impact assessment. A review of the CARB Phase 3 construction plans indicates that the majority of the new equipment installation and operational/process changes will occur in three principal areas of the refinery. The areas can be visualized in terms of three North-South slices (***Area Slice 1, 2 & 3***). In order to characterize the pre-construction environment on the South side of the refinery, two microphone locations were monitored in each North-South slice. The microphones were positioned along a line of sight between the CARB Phase 3 project construction and the community and in line with the anticipated sound propagation from the refinery into the community. One microphone was located on the refinery property line adjacent to Rosecrans Avenue (referred to as the source microphone, Microphones 1-1, 2-1 & 3-1). The second microphone was located a couple of blocks South of Rosecrans Avenue in the residential community of Manhattan Beach (referred to as the receiver microphone, Microphones 1-2, 2-2 & 3-2).

The South Side Noise Survey microphone locations were as follows:

1) **North-South Slice 1** is an area along the East side of the refinery (parallel to Sepulveda Blvd. & the East Patrol Rd.) and encompasses the rail car staging area, the rail loading rack and the new sphere. Slice 1 lines up with Gate 20 and Pine Avenue. Referring to ***Map 1***, **Microphone 1-1** was positioned at Gate 20 just inside the refinery fence. **Microphone 1-2** was attached to the roof of the home located at 3600 Pine Ave. The two microphone locations are also shown in ***Photo Set 1***.

2) **North-South Slice 2** is an area which encompasses the Isomax Complex and lines up with Gate 21 and Pacific Avenue. Referring to ***Map 1***, **Microphone 2-1** was positioned East of Gate 21 just inside the refinery fence. **Microphone 2-2** was attached to the roof of the home located at 3213 Pacific Ave., Manhattan Beach. The two microphone locations are also shown in ***Photo Set 2***.

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3) **North-South Slice 3** is an area which encompasses the FCC and tank construction (at Pipeway & Butler Blvd.) and lines up with Gate 22 and Bell Avenue. Referring to ***Map 2***, **Microphone 3-1** was positioned East of Gate 22 on top of the berm paralleling South Patrol Road. **Microphone 3-2** was mounted on the roof of the National Guard Armory located at 3601 Bell Ave., Manhattan Beach. The two microphone locations are also shown in ***Photo Set 3***.

The South Side Noise Survey data was collected using two identical Larson Davis (LD) outdoor monitoring systems (NMS009). The NMS009 monitors are based upon an LD Type 824 Precision Sound Level Meter fitted with an LD Type PRM 902 Preamplifier and LD Model 2541 Microphone. Both systems were calibrated to manufacturer specifications within 3 months of testing. The calibrations are traceable to the National Institute of Standards Technology (NIST). The analyzers were setup to acquire 1 second averaged sound pressure levels (refer to ***Section III, Data Presentation***).

II.2 Manhattan Beach Noise Survey (July 21st, 1999)

The Manhattan Beach Noise Survey data presented in this report was acquired in July of 1999 (refer to ***Navcon Report No. 99879, Isomax Division Noise Impact Assessment, Manhattan Beach Community Noise Survey***). For the purposes of the 1999 survey, the spatial variation of the noise in the Manhattan Beach community was described by recording levels at the six (6) locations shown in ***Map 3***. **Microphone Locations 1, 2 & 3** were on Rosecrans Avenue, across the street from the refinery. For the most part, the direct line of site[(2)] into the Isomax Complex was blocked by the refinery berm. **Microphone Locations 4 & 5** were on 35th Street, three to four blocks South of the refinery. They were approximately 35' higher than the grade elevation of the refinery and had a direct

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(2) ***Sound Propagation -*** *From a noise propagation standpoint, there is a greater shielding effect when the "line of site" between a noise source and receiver is broken. The amount of shielding (i.e., noise reduction) is dependent upon a number of factors including the frequency of sound, the distance between the source and the shield/barrier, the distance between the receiver and the shield/barrier, etc.*

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line of site into the Isomax Complex. **Microphone Location No. 6** was two blocks South of the refinery. The direct line of site into the refinery was blocked by the refinery berm and houses.

The test instrumentation system used to acquire the 1999 data set consisted of a Hewlett Packard 3569A Real Time Frequency Analyzer fitted with a Bruel & Kjaer 4155 Precision Microphone. The analyzer and microphone were calibrated to manufacturer specifications within 6 months of testing. The calibrations are traceable to the National Institute of Standards Technology (NIST).

The analyzer was placed in a sports utility vehicle. The microphone was attached and extended through the sun roof. The microphone was approximately 8' above the ground. The vehicle was driven to the first location (refer to ***Map 3***) and parked. Three hundred consecutive 1/1 octave band spectra (63 Hz. to 8,000 Hz.) were recorded with an integration time of 1 second per spectra. The total measurement duration was 5 minutes (i.e., 300 consecutive measurements). The vehicle was then moved to the second location, parked and the measurement process repeated. The noise level was sampled for a total of five minutes per hour at each measurement location between the hours of 4 p.m. and 12 a.m. on the evening of July 21st, 1999. The recorded data are presented in ***Section III, Data Presentation***.

II.3 El Segundo Noise Survey (December 15th - 19th, 2000)

The El Segundo Noise Survey data presented in this report was acquired in December of 2000 (refer to ***Navcon Report No. 01122, BOCPP/Chevron CO_2 Recovery Project, Community Noise Impact Assessment***). Three community locations were monitored as shown in ***Map 4***. **Microphone 1** was located at the Westshore Electric Company building on the Northwest corner of Lomita St. and El Segundo Blvd. The **Microphone 1** levels were recorded between December 15th & 16th, 2000. **Microphone *2*** was located at the Ranar Mfg. Co. building on the Southwest corner of Lomita St. and Franklin Ave. The **Microphone 2** levels were recorded between December 16th & 18th, 2000. **Microphone *3*** was located at St. Anthony Church school, South of Grand between

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Lomita St. and Sierra St. The **Microphone 3** levels were recorded between December 18th & 19th, 2000.

The El Segundo Noise Survey data was collected using two identical Larson Davis (LD) outdoor monitoring systems (NMS009). The NMS009 monitors are based upon an LD Type 824 Precision Sound Level Meter fitted with an LD Type PRM 902 Preamplifier and LD Model 2541 Microphone. Both systems were calibrated to manufacturer specifications within 3 months of testing. The calibrations are traceable to the National Institute of Standards Technology (NIST). The analyzers were setup to acquire 1 second averaged sound pressure levels (refer to ***Section III, Data Presentation***).

III. Data Presentation

The noise data was down loaded from the HP3569A & Larson Davis 824 Signal Analyzers to a PC where it was translated into ASCII files and reduced. The data reduction process included the calculation of the statistical noise descriptors presented in ***Table 1*** and the Community Noise Exposure Level (CNEL). The CNEL is a single number index designed to rate environmental noise on a 24 hour basis. It is essentially a weighted modification of the Leq described in ***Table 1*** with 5 dB(A) addition for the evening hours (7 pm to 10 pm) and a 10 dB(A) addition for the night time hours (10 pm to 7 am).

The South Side Noise Survey data are summarized in ***Tables 2 - 7***. The Manhattan Beach Noise Survey data are summarized in ***Table 8 & 9***. The El Segundo Noise Survey Data are summarized in ***Tables 10 - 12***.

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Map 1: South Side Noise Survey (January 2001)
North-South Slices 1 & 2, Microphone Locations 1-1, 1-2, 2-1 & 2-2

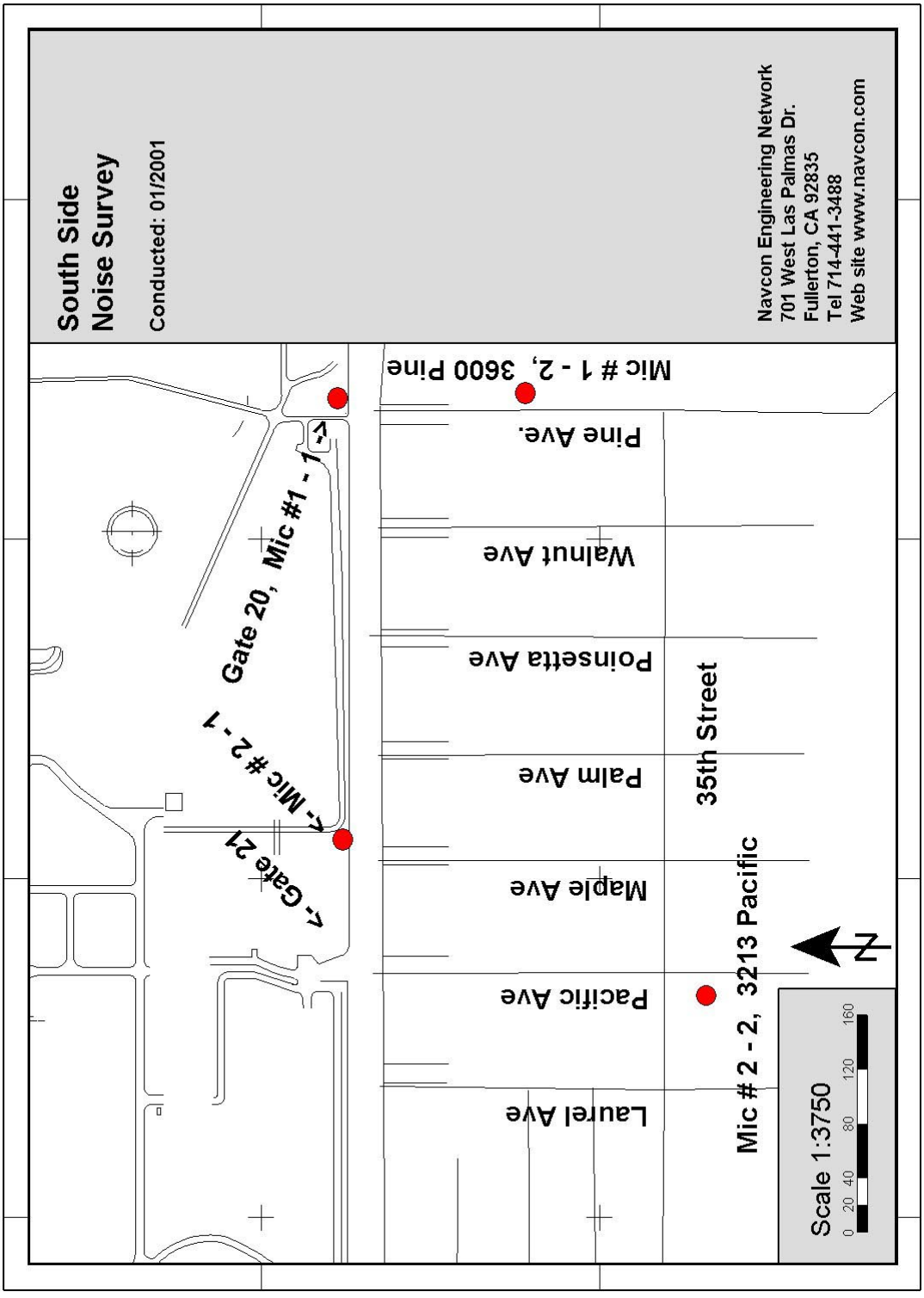

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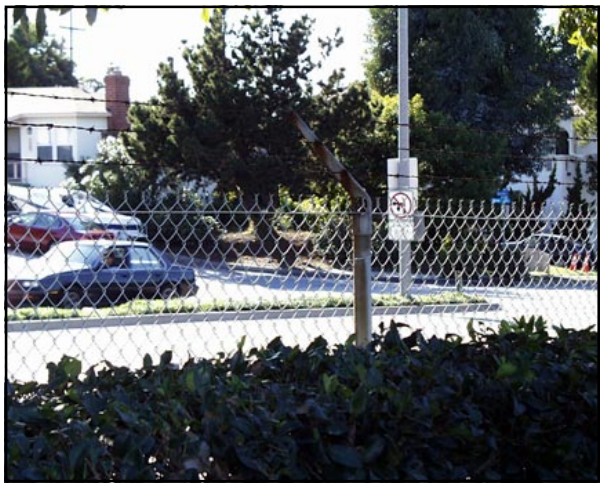
Photo Set 1: Microphone Locations 1-1 (Top Row) & 1-2 (Bottom Row)

Mic 1-1, Gate 20

View of Rosecrans Ave. from Mic 1-1



Mic 1-2, 3600 Pine, Manhattan Beach

View of Chevron from Mic 1-2

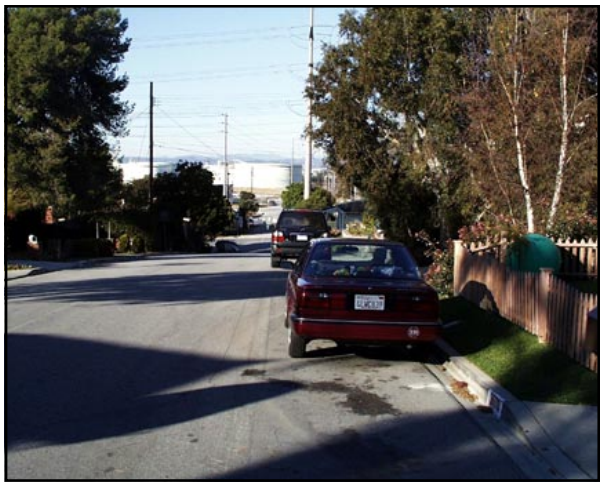


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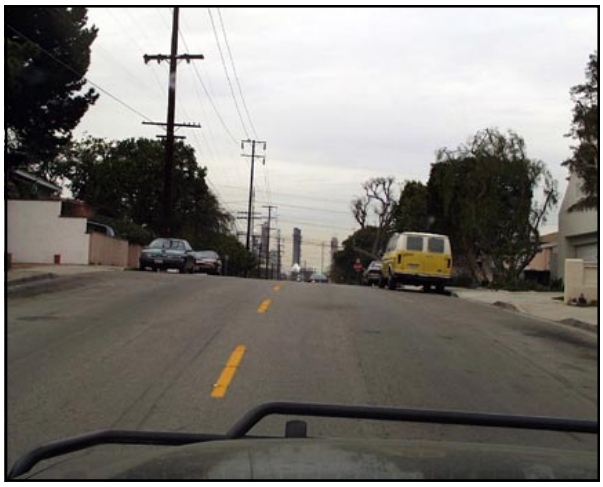
Photo Set 2: Microphone Locations 2-1 (Top Row) & 2-2 (Bottom Row)

Mic 2-1, Gate 21

View of Rosecrans Ave. from Mic 2-1

Mic 2-2, 3213 Pacific, Manhattan Beach

View of Chevron from Mic 2-2



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Map 2: South Side Noise Survey (January 2001)
Microphone Locations 3-1 & 3-2

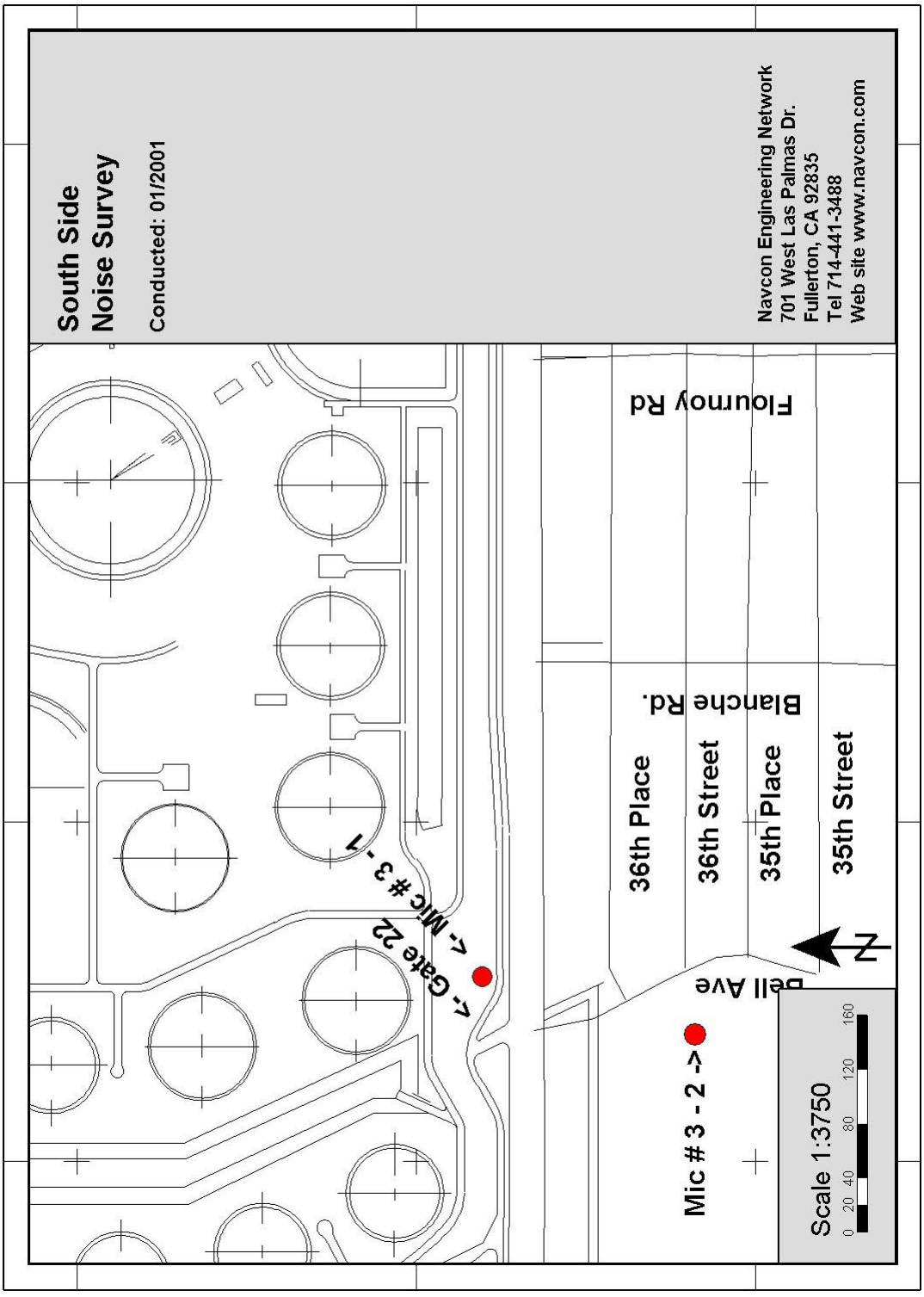

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Photo Set 3: Microphone Locations 3-1 (Top Row) & 3-2 (Bottom Row)

Mic 3-1, Gate 22

View of Rosecrans Ave. from Mic 3-1

Mic 2-2, 3601 Bell, Manhattan Beach

View of Chevron from Mic 3-2

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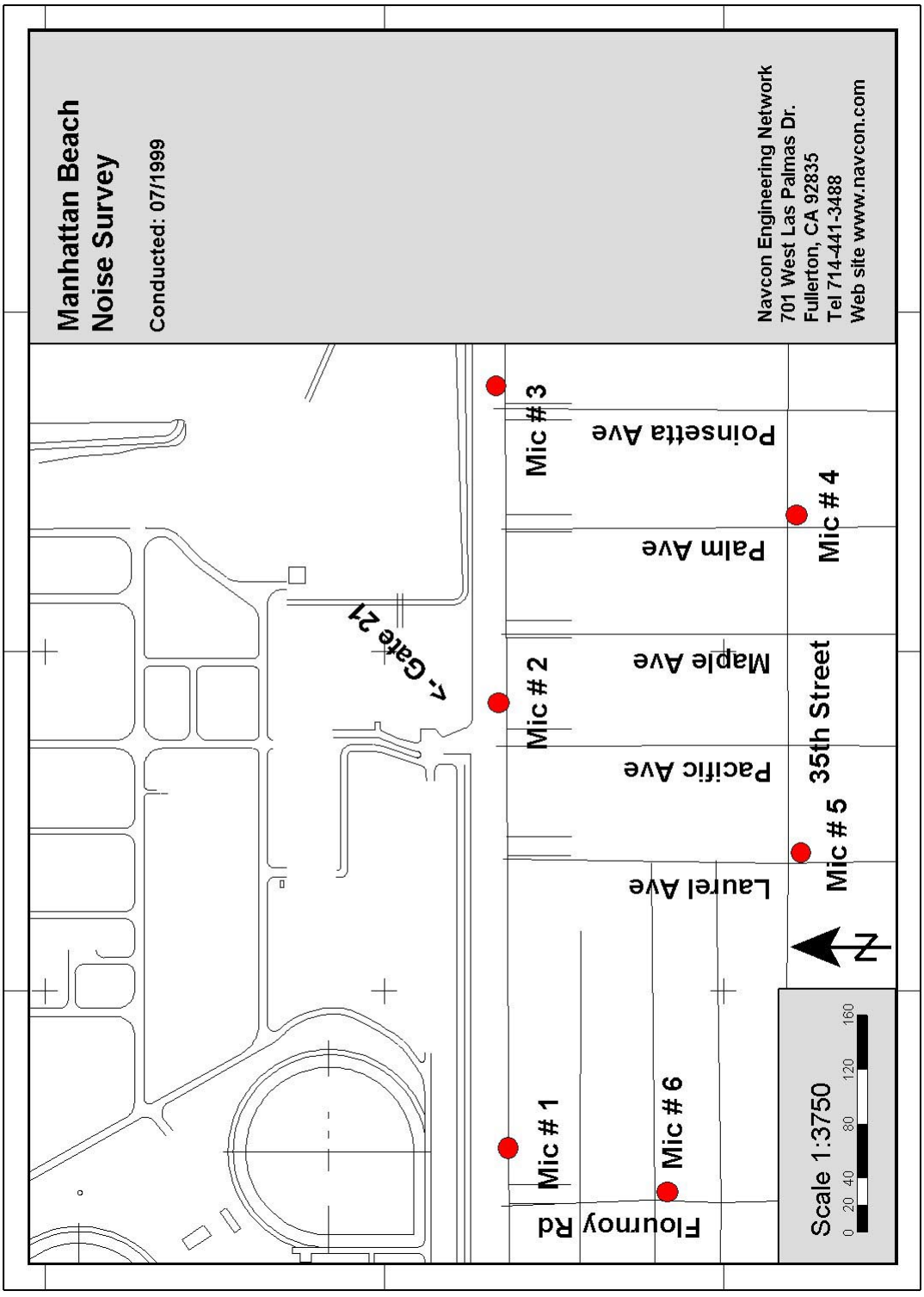
Map 3: Manhattan Beach Noise Survey (July 1999)
Microphone Locations 1, 2, 3, 4, 5 & 6



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Map 4: El Segundo Noise Survey (December 2000)
Microphone Locations 1, 2, 3, 4, 5 & 6

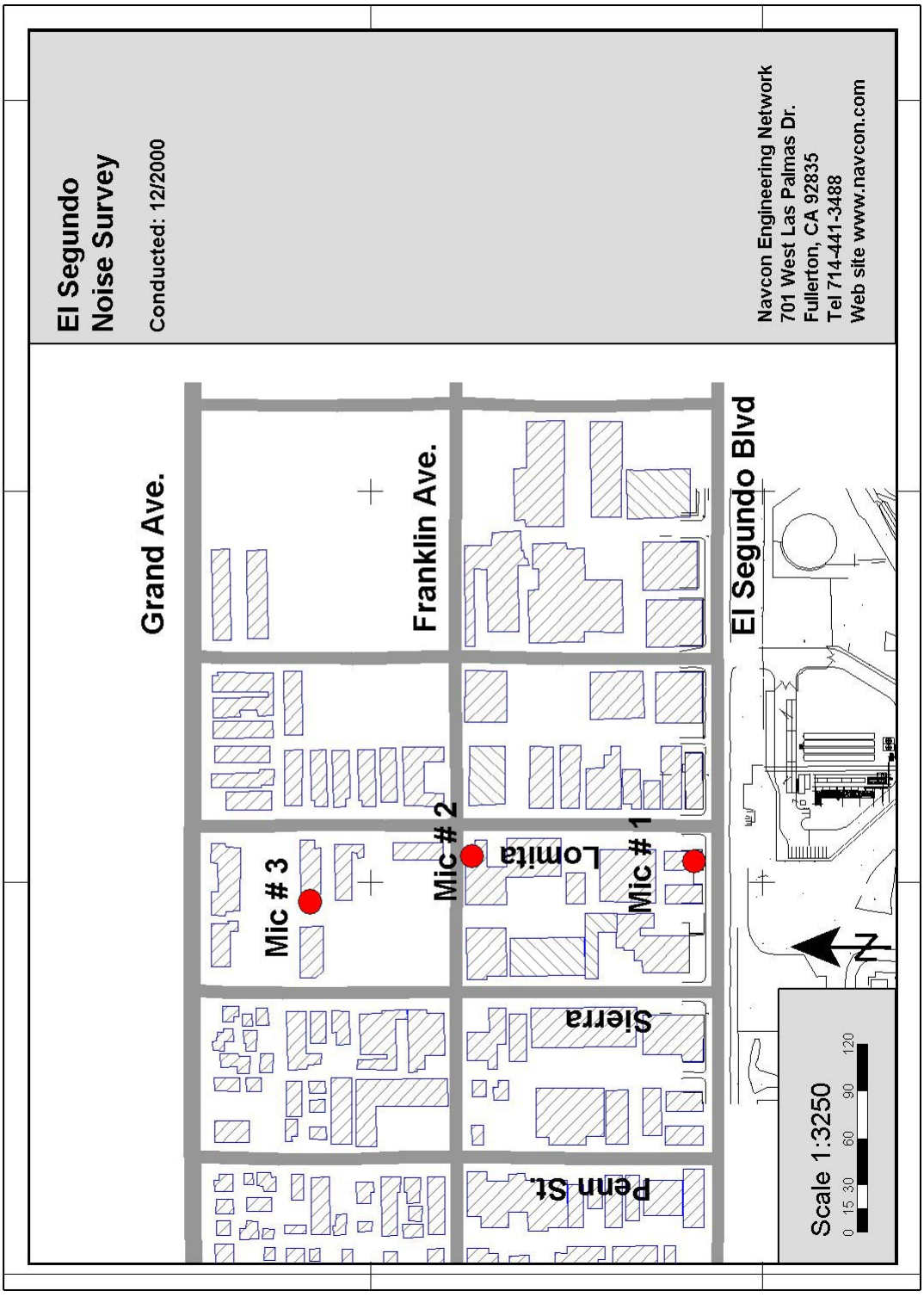

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Table 1: Statistical Noise Level Descriptor Definitions

Level	Description
L_{eq}	The steady state sound pressure level which contains the same amount of acoustical energy as the fluctuating level over the sample period. It is the time weighted, mean square sound pressure level.
L_0	The steady state sound pressure level which is exceeded 0% of the time during the sample period . The L0 Level is often referred to as the Lmax Level and can be attributed to a single event such as a car passing by or an aircraft fly over. The L0 Level is often used as a measure in community noise regulations.
$L_{1.6}$	The steady state sound pressure level which is exceeded 1.6% of the time during the sample period (equivalent 1 minute per hour). The L1.6 Level is often used as a measure in community noise regulations.
$L_{8.3}$	The steady state sound pressure level which is exceeded 8.3% of the time during the sample period (equivalent 5 minutes per hour). The L8.3 Level is often used as a measure in community noise regulations.
L_{10}	The steady state sound pressure level which is exceeded 10% of the time during the sample period (equivalent 6 minutes per hour). The L10 Level is often used along with the L50 Level as an indicator of arterial traffic. The difference, L10 - L50 increases as the traffic flow increases.
L_{25}	The steady state sound pressure level which is exceeded 25% of the time during the sample period (equivalent 15 minutes per hour). The L25 Level is often used as a measure in community noise regulations.
L_{50}	The steady state sound pressure level which is exceeded 50% of the time during the sample period (equivalent 30 minutes per hour). The L50 Level is often used as the base measure in community noise regulations.
L_{90}	The steady state sound pressure level which is exceeded 90% of the time during the sample period (equivalent 54 minutes per hour). L90 Level is often used as a measure of the true “ambient” noise level.
L_{99}	The steady state sound pressure level which is exceeded 99% of the time during the sample period (equivalent 59 minutes per hour).

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Table 2: South Side Noise Survey (Jan 2001), Gate 20, Mic 1-1

Date/Time	Chevron Gate 20 Sound Pressure Levels [dB(A)]							
1/17-18/01	L_{eq}	L_0	$L_{1.66}$	$L_{8.33}$	L_{10}	L_{25}	L_{50}	L_{90}
2:00 PM	**66.5**	83.3	74.1	71.4	71.0	67.0	62.4	53.1
3:00 PM	**67.2**	80.2	74.9	72.3	71.9	67.9	62.7	54.1
4:00 PM	**68.7**	95.2	74.8	72.7	72.4	68.6	64.0	57.5
5:00 PM	**68.3**	79.5	75.4	73.1	72.8	69.6	64.7	57.0
6:00 PM	**67.9**	84.0	74.7	72.6	72.4	69.3	64.4	57.0
7:00 PM	**67.6**	82.3	74.8	72.5	72.3	68.8	63.7	56.0
8:00 PM	**66.8**	78.5	74.7	72.0	71.6	67.6	61.8	55.0
9:00 PM	**65.4**	78.0	73.7	70.9	70.6	65.3	59.3	54.2
10:00 PM	**63.5**	78.2	73.0	68.8	68.2	62.0	56.7	52.1
11:00 PM	**60.5**	74.6	70.6	65.4	64.5	58.2	53.4	50.3
12:00 AM	**59.1**	79.2	68.8	61.3	60.5	56.0	55.1	53.6
1:00 AM	**58.1**	78.5	66.8	59.1	58.5	56.4	55.6	54.5
2:00 AM	**57.2**	77.8	66.5	57.0	56.8	55.7	54.8	53.3
3:00 AM	**54.8**	74.5	62.8	55.4	55.0	53.9	52.7	50.9
4:00 AM	**60.9**	88.2	68.7	59.7	58.6	54.4	53.0	50.8
5:00 AM	**63.4**	78.9	73.0	68.1	67.4	62.3	57.0	54.0
6:00 AM	**65.6**	81.6	74.8	70.7	70.0	64.2	59.8	55.4
7:00 AM	**67.9**	83.3	76.1	72.6	72.2	67.8	63.2	56.6
8:00 AM	**67.4**	81.2	75.5	72.5	72.1	67.6	63.4	55.3
9:00 AM	**67.0**	79.3	74.9	72.0	71.6	67.5	63.2	54.1
10:00 AM	**66.5**	80.5	74.5	71.6	71.2	66.8	62.1	51.8
11:00 AM	**67.4**	84.7	75.1	72.1	71.7	68.1	63.3	52.5
12:00 PM	**67.2**	78.6	75.0	72.1	71.7	68.2	63.2	53.6
1:00 PM	**67.3**	83.3	75.1	72.0	71.7	68.1	63.2	53.1
2:00 PM	67.3	82.2	74.8	72.2	71.8	68.1	62.9	54.0
CNEL	**70.0**	**dB(A)**						

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Table 3: South Side Survey (Jan 2001), 3600 Pine , Manhattan Beach, Mic 1-2

Date/Time 1/17-18/01	3600 Pine Ave., Manhattan Beach Sound Pressure Levels [dB(A)]							
	L_{eq}	L_0	$L_{1.66}$	$L_{8.33}$	L_{10}	L_{25}	L_{50}	L_{90}
3:00 PM	**56.2**	73.0	62.8	59.2	58.9	56.0	54.2	51.3
4:00 PM	**57.8**	74.8	63.5	59.1	58.9	57.8	57.0	55.1
5:00 PM	**57.5**	77.0	61.6	58.7	58.6	57.4	56.3	54.7
6:00 PM	**56.6**	70.6	61.1	58.2	57.9	56.9	55.9	54.4
7:00 PM	**57.1**	80.5	63.8	59.3	58.8	56.5	55.3	53.4
8:00 PM	**56.2**	68.3	61.9	58.4	58.1	56.3	55.3	53.5
9:00 PM	**55.0**	65.5	59.9	56.3	56.0	55.0	54.4	53.3
10:00 PM	**54.3**	65.7	59.1	56.6	56.3	54.8	53.6	51.2
11:00 PM	**52.7**	69.4	57.7	54.5	54.3	53.1	51.9	49.8
12:00 AM	**54.0**	58.5	56.9	56.0	55.9	54.8	53.8	52.1
1:00 AM	**54.9**	65.4	57.0	55.9	55.9	55.4	54.7	53.8
2:00 AM	**54.9**	64.6	57.5	56.2	56.1	55.5	54.7	52.9
3:00 AM	**53.6**	63.8	56.1	55.1	55.0	54.2	53.3	52.0
4:00 AM	**54.0**	60.6	56.9	55.8	55.8	54.8	53.7	52.0
5:00 AM	**56.6**	64.7	59.4	58.0	57.9	57.2	56.4	54.9
6:00 AM	**56.9**	65.8	58.9	57.9	57.8	57.4	56.8	55.6
7:00 AM	**56.9**	72.4	60.8	58.6	58.4	57.2	56.2	54.7
8:00 AM	**56.3**	68.5	61.6	58.5	58.3	57.0	55.2	52.6
9:00 AM	**54.6**	68.5	61.3	57.4	57.0	55.2	53.2	49.4
10:00 AM	**53.4**	72.4	62.3	55.8	55.1	52.4	50.2	47.5
11:00 AM	**55.3**	76.8	62.9	56.4	56.0	53.0	50.6	47.7
12:00 PM	**58.6**	77.5	69.7	61.5	60.4	54.8	52.4	49.3
1:00 PM	**53.0**	67.5	60.3	55.9	55.5	52.9	51.0	48.6
2:00 PM	**55.0**	76.1	61.9	56.9	56.5	53.9	52.7	51.0
3:00 PM	58.2	79.0	67.7	59.5	58.9	56.5	55.0	52.6
CNEL	**61.8**	**dB(A)**						

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Table 4: South Side Survey (Jan 2001), Gate 21, Mic 2-1

Date/Time 1/16-17/01	Chevron Gate 21 Sound Pressure Levels [dB(A)]							
	L_{eq}	L_0	$L_{1.66}$	$L_{8.33}$	L_{10}	L_{25}	L_{50}	L_{90}
1:00 PM	**68.0**	81.7	76.4	72.8	72.4	68.4	63.3	55.4
2:00 PM	**68.1**	82.6	76.5	73.1	72.7	68.2	63.0	55.0
3:00 PM	**68.8**	91.5	76.6	73.4	72.9	68.9	63.7	56.2
4:00 PM	**67.9**	81.5	76.1	72.8	72.4	68.4	63.3	56.5
5:00 PM	**68.5**	80.7	76.5	73.4	73.0	69.0	64.6	58.0
6:00 PM	**68.4**	79.7	75.9	73.4	73.1	69.4	64.2	57.7
7:00 PM	**68.5**	81.3	76.5	73.6	73.2	69.1	63.8	57
8:00 PM	**67.4**	81.6	75.7	72.7	72.3	67.8	61.7	56.1
9:00 PM	**67.0**	80.8	76	72.6	72.1	65.8	60.4	55.8
10:00 PM	**64.8**	78.9	74.6	69.9	69.2	62.6	58.2	56
11:00 PM	**62.2**	79.3	72.4	65.9	64.8	59.5	56.9	55.3
12:00 AM	**60.4**	77.2	71.1	61.8	61	56.8	55.7	54.5
1:00 AM	**58.6**	78.5	68.3	59	58.4	56.4	55.5	54.1
2:00 AM	**58.6**	81.7	67.5	58.3	57.8	56.4	55.6	54.6
3:00 AM	**57.8**	75.8	66.1	57.5	57.1	56.2	55.6	54.8
4:00 AM	**60.6**	80.2	70.9	61.7	61	57.1	56.2	55.2
5:00 AM	**63.5**	78.9	73.7	67.4	66.1	61.2	57.8	55.6
6:00 AM	**66.4**	81.6	75.6	71.6	71	64.7	60.6	56.6
7:00 AM	**67.2**	81.9	75.9	71.9	71.4	67.2	63.1	57.1
8:00 AM	**67.5**	81.7	76	72.4	71.9	67.4	63	55.7
9:00 AM	**67.1**	81	75.9	72.4	71.8	67.1	61.7	53.9
10:00 AM	**66.9**	78.8	75.6	72.2	71.7	66.8	61.6	54
11:00 AM	**67.8**	81.5	76.3	73	72.6	68	62.6	54.3
12:00 PM	**68.3**	83.2	76.6	73.4	73	68.8	63.2	55
1:00 PM	68.2	83.6	76.3	73.4	72.9	68.3	63.2	54.3
CNEL	**70.8**	**dB(A)**						

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Table 5: South Side Survey (Jan 2001), 3213 Pacific, M. Beach, Mic 2-2

Date/Time	3213 Pacific Ave, Manhattan Beach Sound Pressure Levels [dB(A)]							
1/16-17/01	Leq	L_0	$L_{1.66}$	$L_{8.33}$	L_{10}	L_{25}	L_{50}	L_{90}
1:00 PM	**57.2**	77.6	65.7	61.9	61.4	57.0	52.1	46.6
2:00 PM	**58.5**	76.4	66.8	62.7	62.3	58.5	53.3	48.4
3:00 PM	**61.9**	84.8	69.6	64.9	64.5	61.2	56.5	50.1
4:00 PM	**61.9**	80.6	69.9	66.0	65.4	61.1	56.8	51.1
5:00 PM	**59.7**	74.9	66.2	63.2	62.9	60.7	57.4	52.5
6:00 PM	**58.3**	71.5	64.7	62.1	61.9	59.6	55.9	51.6
7:00 PM	**57.6**	72.7	64.7	61.8	61.6	58.6	54.0	49.9
8:00 PM	**56.0**	71.9	64.2	60.5	60.0	55.4	51.6	48.3
9:00 PM	**53.8**	68.8	63.2	57.7	56.9	51.8	49.9	47.9
10:00 PM	**54.1**	68.3	62.4	56.8	56.2	53.4	51.8	50.2
11:00 PM	**52.1**	63.3	57.9	53.9	53.7	52.3	51.2	49.6
12:00 AM	**50.4**	64.3	54.4	51.7	51.6	50.6	49.7	48.4
1:00 AM	**51.4**	67.1	58.2	53.8	53.2	51.0	49.9	48.2
2:00 AM	**50.2**	64.3	54.3	51.5	51.3	50.3	49.5	48.2
3:00 AM	**50.4**	63.3	53.9	51.2	51.0	50.5	49.8	48.9
4:00 AM	**51.4**	71.6	57.9	51.9	51.7	50.8	50.0	49.0
5:00 AM	**52.9**	67.0	61.2	54.5	54.1	52.8	51.0	49.2
6:00 AM	**56.1**	72.6	64.6	60.5	59.9	54.6	51.9	50.2
7:00 AM	**60.5**	76.1	67.4	64.7	64.4	61.9	57.4	51.5
8:00 AM	**60.4**	71.0	66.6	64.2	64.0	62.0	58.7	50.7
9:00 AM	**59.1**	77.0	66.6	63.3	62.9	59.5	53.7	45.7
10:00 AM	**56.7**	72.7	65.0	61.5	61.1	56.3	51.2	47.0
11:00 AM	**57.0**	76.2	65.3	61.3	60.8	56.2	51.7	47.6
12:00 PM	**57.6**	76.2	65.4	61.7	61.3	57.2	52.9	48.7
1:00 PM	60.2	81.2	67.5	63.2	62.8	59.2	54.6	48.8
CNEL	**61.1**	dB(A)						

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Table 6: South Side Survey (Jan 2001), Gate 22, Mic 3-1

Date/Time 1/5-6/01	Chevron Gate 22 Sound Pressure Levels [dB(A)]							
	L_{eq}	L_0	$L_{1.66}$	$L_{8.33}$	L_{10}	L_{25}	L_{50}	L_{90}
2:00 PM	**64.2**	75.4	70.8	68.4	68.0	65.4	62.0	55.3
3:00 PM	**64.4**	77.3	71.1	68.5	68.2	65.4	62.1	56.0
4:00 PM	**64.6**	75.2	71.0	68.7	68.4	65.9	62.6	56.4
5:00 PM	**64.6**	74.7	70.5	68.5	68.2	65.9	63.0	57.1
6:00 PM	**64.6**	72.9	70.5	68.6	68.3	65.9	63.0	56.1
7:00 PM	**64.1**	73.1	69.9	67.9	67.7	65.5	62.5	56.4
8:00 PM	**62.8**	72.7	69.4	67.2	66.9	64.1	60.3	54.8
9:00 PM	**62.5**	77.0	69.3	66.9	66.6	63.6	59.6	54.3
10:00 PM	**61.7**	73.0	69.0	66.3	66.0	62.6	58.4	54.1
11:00 PM	**60.4**	71.4	68.2	65.2	64.7	60.9	56.6	53.1
12:00 AM	**59.6**	72.0	67.9	64.0	63.6	59.6	55.0	52.5
1:00 AM	**59.2**	75.1	67.3	63.2	62.7	59.0	55.5	52.7
2:00 AM	**57.4**	71.0	65.4	60.5	59.9	56.4	54.9	53.6
3:00 AM	**55.9**	69.5	63.6	57.6	57.0	54.9	54.4	53.3
4:00 AM	**56.2**	70.9	63.7	57.6	56.9	55.4	54.7	54.0
5:00 AM	**57.3**	70.4	65.3	59.9	59.3	56.0	55.1	54.1
6:00 AM	**59.5**	71.5	66.5	63.9	63.5	59.8	56.2	54.1
7:00 AM	**61.2**	73.1	68.9	65.6	65.2	61.4	58.0	54.1
8:00 AM	**63.1**	82.8	69.6	66.6	66.3	63.7	60.1	54.8
9:00 AM	**63.3**	80.1	70.2	67.4	67.0	64.3	60.8	55.0
10:00 AM	**63.5**	73.5	69.9	67.7	67.4	64.7	61.4	54.9
11:00 AM	**63.8**	73.7	70.0	67.9	67.6	65.2	61.6	55.6
12:00 PM	**64.5**	74.9	70.4	68.5	68.3	66.0	62.7	56.9
1:00 PM	**64.7**	79.2	71.0	68.8	68.6	66.0	62.5	56.4
2:00 PM	64.3	75.0	70.4	68.3	68.1	65.8	62.4	56.2
3:00 PM	64.1	77.5	70.5	68.1	67.8	65.2	62.0	56.5
CNEL	**67.0**	**dB(A)**						

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Table 7: South Side Survey (Jan 2001), 3601 Bell, M. Beach, Mic 3-2

Date/Time 1/5-6/01	3601 Bell Ave., Manhattan Beach Sound Pressure Levels [dB(A)]							
	L_{eq}	L_0	$L_{1.66}$	$L_{8.33}$	L_{10}	L_{25}	L_{50}	L_{90}
2:00 PM	**56.1**	72.7	63.3	59.3	58.9	56.5	54.1	50.4
3:00 PM	**55.1**	69.8	62.5	58.1	57.8	55.3	53.3	50.5
4:00 PM	**57.5**	81.4	64.9	58.4	58.0	55.8	53.7	50.7
5:00 PM	**53.9**	65.8	59.6	56.6	56.3	54.5	52.8	50.5
6:00 PM	**53.4**	64.4	57.8	56.0	55.8	54.3	52.6	49.8
7:00 PM	**53.5**	64.6	59.2	56.5	56.2	54.1	52.3	49.6
8:00 PM	**54.0**	67.2	59.9	56.8	56.6	54.6	52.7	50.1
9:00 PM	**52.7**	62.4	57.8	55.3	55.0	53.3	51.7	49.4
10:00 PM	**52.7**	63.9	57.8	54.9	54.8	53.3	51.9	49.6
11:00 PM	**50.9**	61.9	56.0	53.5	53.2	51.6	49.9	47.5
12:00 AM	**50.0**	62.2	55.2	52.5	52.2	50.6	49.1	46.6
1:00 AM	**51.6**	61.7	55.5	54.1	54.0	52.9	51.4	46.3
2:00 AM	**52.4**	60.3	55.4	53.8	53.8	52.9	52.2	50.4
3:00 AM	**50.9**	60.9	54.3	51.8	51.7	50.9	50.6	49.8
4:00 AM	**51.4**	56.8	53.8	52.5	52.4	51.8	51.3	50.3
5:00 AM	**51.9**	61.9	56.1	53.3	53.1	52.2	51.5	50.4
6:00 AM	**52.7**	62.2	57.0	54.7	54.5	53.3	52.2	50.1
7:00 AM	**53.9**	66.0	59.9	57.4	57.1	54.5	52.4	49.4
8:00 AM	**53.7**	69.4	60.5	56.8	56.5	54.3	52.1	48.7
9:00 AM	**54.0**	72.3	60.7	57.0	56.8	54.6	52.2	48.5
10:00 AM	**52.6**	68.5	59.3	55.8	55.5	53.3	50.9	46.9
11:00 AM	**52.4**	64.6	58.1	55.6	55.3	53.5	51.1	47.2
12:00 PM	**52.3**	65.3	58.0	55.6	55.4	53.3	50.9	47.1
1:00 PM	**54.1**	71.9	59.8	57.0	56.7	54.4	52.2	48.4
2:00 PM	52.8	65.9	58.1	55.8	55.5	53.6	51.6	48.2
3:00 PM	54.7	70.9	62.8	57.5	57.1	54.4	52.2	48.6
CNEL	**58.9**	**dB(A)**						

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Table 8: Manhattan Beach Noise Survey (Jul 1999)
716 Rosecrans, Rosecrans & Pacific and Rosecrans & Poinsetta

	716 Rosecrans, Manhattan Beach Sound Pressure Levels [dB(A)]						
7/21/99	**L_{eq}**	**L_0**	**L_1**	**L_{10}**	**L_{50}**	**L_{90}**	**L_{99}**
4:10 PM	72.1	82.8	80.0	76.0	68.5	59.5	55.0
5:09 PM	70.3	80.3	78.5	74.5	66.0	53.0	50.0
6:05 PM	71.9	80.9	78.5	75.5	69.5	59.0	55.5
7:13 PM	71.3	79.4	78.0	75.5	68.5	58.0	50.5
8:09 PM	71.6	84.9	79.0	75.0	68.0	60.5	56.0
9:06 PM	68.6	78.7	76.0	72.5	64.5	53.0	49.5
10:31 PM	67.3	78.1	75.5	71.5	63.0	55.0	51.5
11:45 PM	63.9	80.1	77.0	65.5	53.0	48.5	47.5

	Rosecrans & Pacific, Manhattan Beach Sound Pressure Levels [dB(A)]						
7/21/99	**L_{eq}**	**L_0**	**L_1**	**L_{10}**	**L_{50}**	**L_{90}**	**L_{99}**
4:20 PM	71.4	85.2	80.5	75.0	65.5	58.0	55.5
5:18 PM	73.6	91.0	83.5	76.0	68.5	61.5	59.0
6:13 PM	71.3	82.3	80.0	75.5	66.5	60.5	58.0
7:22 PM	72.1	82.1	80.0	75.5	69.0	61.5	56.5
8:17 PM	70.5	81.8	78.5	74.5	67.5	60.0	56.5
9:17 PM	68.3	84.9	78.0	71.5	63.0	56.0	53.0
10:50 PM	67.9	83.1	76.5	71.0	62.5	54.0	52.5
11:54 PM	60.7	78.9	72.5	63.0	53.0	51.5	50.5

	Rosecrans & Pointsetta, Manhattan Beach Sound Pressure Levels [dB(A)]						
7/21/99	**L_{eq}**	**L_0**	**L_1**	**L_{10}**	**L_{50}**	**L_{90}**	**L_{99}**
4:30 PM	73.4	88.6	80.5	76.5	69.5	57.5	56.0
5:26 PM	72.0	83.3	81.0	76.0	67.0	59.0	56.0
6:21 PM	72.7	81.3	80.0	77.5	69.0	57.0	54.0
7:30 PM	72.9	81.3	80.0	77.0	69.5	60.0	55.5
8:25 PM	70.8	80.3	79.0	74.5	67.0	59.0	57.0
9:25 PM	70.0	85.1	78.0	73.5	66.0	59.0	57.0
11:02 PM	66.4	78.5	75.5	70.5	59.0	54.5	53.5
12:03 AM	62.9	76.8	75.5	66.0	55.5	53.0	51.5

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Table 9: Manhattan Beach Noise Survey (Jul 1999)
Palm & 35th Street, Laurel & 35th Street and Flournoy & 36 Street

	Palm and 35th Street, Manhattan Beach Sound Pressure Levels [dB(A)]						
7/21/99	**L_{eq}**	**L_0**	**L_1**	**L_{10}**	**L_{50}**	**L_{90}**	**L_{99}**
4:40 PM	56.4	68.7	66.5	58.0	53.5	51.5	50.5
5:36 PM	57.8	72.5	67.5	59.0	53.5	52.0	50.5
6:41 PM	55.3	67.7	65.5	57.0	52.0	50.0	49.0
7:40 PM	55.5	70.6	64.0	56.5	53.0	52.0	51.0
8:35 PM	58.7	72.2	67.0	60.5	55.5	54.0	53.0
9:36 PM	55.9	68.3	62.5	57.0	54.0	52.0	51.0
11:14 PM	53.7	65.1	61.5	55.0	52.0	50.5	50.0
12:12 AM	55.3	73.3	69.5	51.0	49.5	48.5	47.5

	Laurel and 35th Street, Manhattan Beach Sound Pressure Levels [dB(A)]						
7/21/99	**L_{eq}**	**L_0**	**L_1**	**L_{10}**	**L_{50}**	**L_{90}**	**L_{99}**
4:50 PM	58.2	73.6	68.5	61.0	53.5	50.0	48.0
5:45 PM	54.2	68.6	62.0	56.5	51.0	49.0	48.0
6:41 PM	55.3	67.8	65.5	57.0	52.0	50.0	49.0
7:49 PM	61.5	82.1	73.5	58.5	52.5	50.5	49.5
8:45 PM	56.2	72.1	67.5	57.0	52.0	50.0	49.0
9:48 PM	54.2	61.9	60.5	57.0	52.0	48.0	47.0
11:25 PM	51.9	61.2	58.5	53.5	50.5	49.0	48.5
12:22 AM	54.1	68.2	62.5	56.5	50.0	49.0	48.0

	Flournoy and 36th Street, Manhattan Beach Sound Pressure Levels [dB(A)]						
7/21/99	**L_{eq}**	**L_0**	**L_1**	**L_{10}**	**L_{50}**	**L_{90}**	**L_{99}**
4:00 PM	52.5	66.8	59.5	54.0	50.5	48.0	47.0
5:00 PM	52.2	65.4	63.0	54.0	48.0	45.5	44.5
5:55 PM	55.4	69.7	68.0	56.5	50.0	47.0	45.5
6:50 PM	56.9	70.9	68.0	60.0	51.0	46.5	45.0
8:00 PM	55.7	71.3	66.5	58.0	50.0	48.0	47.0
8:55 PM	54.8	71.3	66.0	55.0	51.0	49.0	48.0
10:17 PM	51.8	66.5	61.5	53.0	49.0	46.5	45.5
11:34 PM	49.0	59.9	58.5	51.5	46.0	44.5	43.5

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Table 10: El Segundo Noise Survey (Dec 2000), Lomita & El Segundo, Mic 1

Date/Time	Lomita & El Segundo, El Segundo Sound Pressure Levels [dB(A)]							
12/15-16/00	L_{eq}	L_0	$L_{1.66}$	$L_{8.33}$	L_{10}	L_{25}	L_{50}	L_{90}
4:00 PM	**68.1**	78.3	73.5	70.6	70.4	68.8	67.3	64.4
5:00 PM	**67.4**	76.9	72.9	69.9	69.7	68.1	66.6	63.8
6:00 PM	**67.1**	85.3	72.9	69.6	69.3	67.5	65.7	62.5
7:00 PM	**66.1**	77.7	72.5	68.9	68.7	66.7	64.6	61.7
8:00 PM	**65.9**	78.1	72.5	68.7	68.4	66.5	64.4	61.7
9:00 PM	**65.7**	77.3	72.2	68.6	68.3	66.3	64.0	61.9
10:00 PM	**64.6**	79.6	71.8	67.4	67.1	64.7	62.7	60.6
11:00 PM	**65.2**	81.7	72.9	68.2	67.8	64.9	62.6	60.9
12:00 AM	**64.5**	77.1	71.5	67.4	67.0	64.6	62.6	61.2
1:00 AM	**65.3**	78.5	73.3	67.9	67.5	64.8	63.2	61.4
2:00 AM	**63.5**	78.5	71.4	65.2	64.7	62.5	61.7	60.9
3:00 AM	**63.5**	76.8	71.3	65.2	64.7	62.7	61.9	61.1
4:00 AM	**62.8**	76.1	70.8	65.3	64.7	61.8	60.8	60.2
5:00 AM	**64.8**	77.1	72.2	67.2	66.8	64.6	63.1	61.5
6:00 AM	**66.0**	77.1	72.8	68.8	68.5	66.1	64.4	63.0
7:00 AM	**67.2**	81.3	73.7	70.0	69.7	67.5	65.6	63.6
8:00 AM	**66.3**	76.9	72.6	69.4	69.1	66.9	64.8	61.9
9:00 AM	**65.9**	79.1	72.7	68.8	68.5	66.5	64.5	61.1
10:00 AM	**65.3**	77.5	71.9	68.3	68.0	66.2	63.9	60.1
11:00 AM	**65.2**	76.3	71.6	68.0	67.8	66.0	64.0	60.2
12:00 PM	**65.4**	76.5	71.9	68.3	68.0	66.3	64.3	60.0
1:00 PM	**65.2**	75.6	70.9	68.2	67.9	66.1	64.2	60.0
2:00 PM	**65.0**	76.3	71.5	68.0	67.7	65.9	63.6	59.9
3:00 PM	**64.8**	75.5	70.2	67.7	67.5	65.7	63.6	60.7
CNEL	**71.6**	**dB(A)**						

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Table 11: El Segundo Noise Survey (Dec 2000), Lomita & Franklin, Mic 2

Date/Time	Lomita & Franklin, El Segundo Sound Pressure Levels [dB(A)]							
12/16-17/00	L_{eq}	L_0	$L_{1.66}$	$L_{8.33}$	L_{10}	L_{25}	L_{50}	L_{90}
7:00 PM	**57.8**	73.1	64.0	60.8	60.5	58.0	56.2	53.3
8:00 PM	**57.8**	75.0	66.2	61.0	60.5	56.9	54.8	52.3
9:00 PM	**57.2**	73.8	65.1	60.0	59.5	56.8	54.7	53.1
10:00 PM	**58.1**	74.5	66.8	61.5	60.9	57.0	54.6	51.6
11:00 PM	**56.6**	75.1	65.5	59.9	59.3	55.8	53.4	51.2
12:00 AM	**56.4**	75.6	65.6	59.2	58.5	55.2	52.6	49.8
1:00 AM	**55.0**	73.0	63.3	56.9	56.5	53.8	52.6	50.7
2:00 AM	**54.0**	67.8	59.8	55.4	55.1	53.9	53.1	51.5
3:00 AM	**55.0**	74.4	63.1	54.6	54.2	52.7	51.7	50.2
4:00 AM	**54.6**	67.2	60.9	56.4	55.9	54.3	53.4	52.1
5:00 AM	**53.5**	62.9	57.8	54.9	54.9	54.0	53.2	51.4
6:00 AM	**55.3**	66.0	61.5	58.2	57.9	55.4	53.9	52.0
7:00 AM	**58.6**	79.4	65.3	59.8	59.5	57.4	55.6	53.1
8:00 AM	**57.9**	72.5	64.7	61.0	60.7	58.2	56.1	53.3
9:00 AM	**57.6**	73.2	66.3	61.2	60.7	57.1	54.3	50.6
10:00 AM	**57.1**	72.2	65.4	60.4	59.9	57.0	54.5	51.2
11:00 AM	**60.4**	80.3	67.4	62.9	62.4	59.8	57.7	55.3
12:00 PM	**60.9**	78.3	68.6	63.1	62.7	60.1	58.4	56.4
1:00 PM	**58.3**	71.4	65.8	60.6	60.3	58.4	56.5	53.9
2:00 PM	**57.7**	73.8	64.8	60.2	59.8	57.5	55.8	53.9
3:00 PM	**59.1**	71.2	65.4	61.7	61.4	59.3	57.8	55.7
4:00 PM	**60.2**	71.8	67.4	62.7	62.3	60.0	58.7	57.2
5:00 PM	**60.4**	73.1	65.7	62.7	62.4	60.7	59.4	58.0
6:00 PM	**62.7**	73.6	69.4	65.3	64.8	62.7	61.2	59.3
CNEL	**63.1**	**dB(A)**						

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Table 12: El Segundo Noise Survey (Dec 2000), Saint Anthony School, Mic s

Date/Time	St. Anthony School, El Segundo Sound Pressure Levels [dB(A)]							
12/18-19/00	L_{eq}	L_0	$L_{1.66}$	$L_{8.33}$	L_{10}	L_{25}	L_{50}	L_{90}
7:00 PM	**53.9**	68.3	61.0	56.6	56.3	54.0	52.2	49.7
8:00 PM	**53.7**	69.6	60.9	57.2	56.9	53.9	51.3	48.9
9:00 PM	**52.9**	67.3	60.6	55.7	55.3	52.6	50.7	49.1
10:00 PM	**53.3**	66.0	60.8	56.3	55.9	53.4	51.1	49.0
11:00 PM	**53.2**	68.1	61.7	56.5	56.0	52.8	50.5	47.8
12:00 AM	**52.3**	68.3	60.6	56.0	55.4	51.5	49.0	47.0
1:00 AM	**50.6**	67.5	60.2	52.1	51.4	48.9	47.8	46.3
2:00 AM	**47.5**	61.6	52.5	48.9	48.8	47.6	46.7	45.4
3:00 AM	**51.0**	70.8	60.2	50.4	50.0	48.6	47.4	45.4
4:00 AM	**49.9**	66.9	57.3	51.1	50.7	48.9	47.9	46.2
5:00 AM	**51.3**	74.2	58.7	52.3	51.9	50.2	49.0	47.3
6:00 AM	**55.9**	72.5	64.2	58.8	58.4	55.1	52.8	50.2
7:00 AM	**58.0**	73.0	67.1	61.0	60.4	56.9	54.5	52.3
8:00 AM	**56.0**	71.5	62.0	58.6	58.3	56.4	54.8	52.3
9:00 AM	**55.8**	70.0	62.0	58.6	58.2	56.0	54.3	52.0
10:00 AM	**55.8**	81.3	60.8	56.3	56.0	53.9	52.1	49.5
11:00 AM	**57.2**	70.0	66.3	60.8	60.0	56.3	53.8	50.3
12:00 PM	**57.9**	67.7	62.5	60.0	59.8	58.3	57.2	55.5
1:00 PM	**58.3**	70.5	62.6	60.1	59.9	58.7	57.7	56.2
2:00 PM	**59.4**	66.5	62.7	60.9	60.8	59.8	59.0	57.7
3:00 PM	**60.0**	73.6	63.0	61.2	61.0	60.4	59.6	58.3
4:00 PM	**60.6**	65.5	63.5	62.0	61.9	61.2	60.3	59.0
5:00 PM	**61.8**	72.9	68.9	64.2	63.5	61.4	60.4	59.1
6:00 PM	**61.6**	71.7	66.2	63.2	63.0	61.9	60.9	59.6
CNEL	**60.5**	**dB(A)**						

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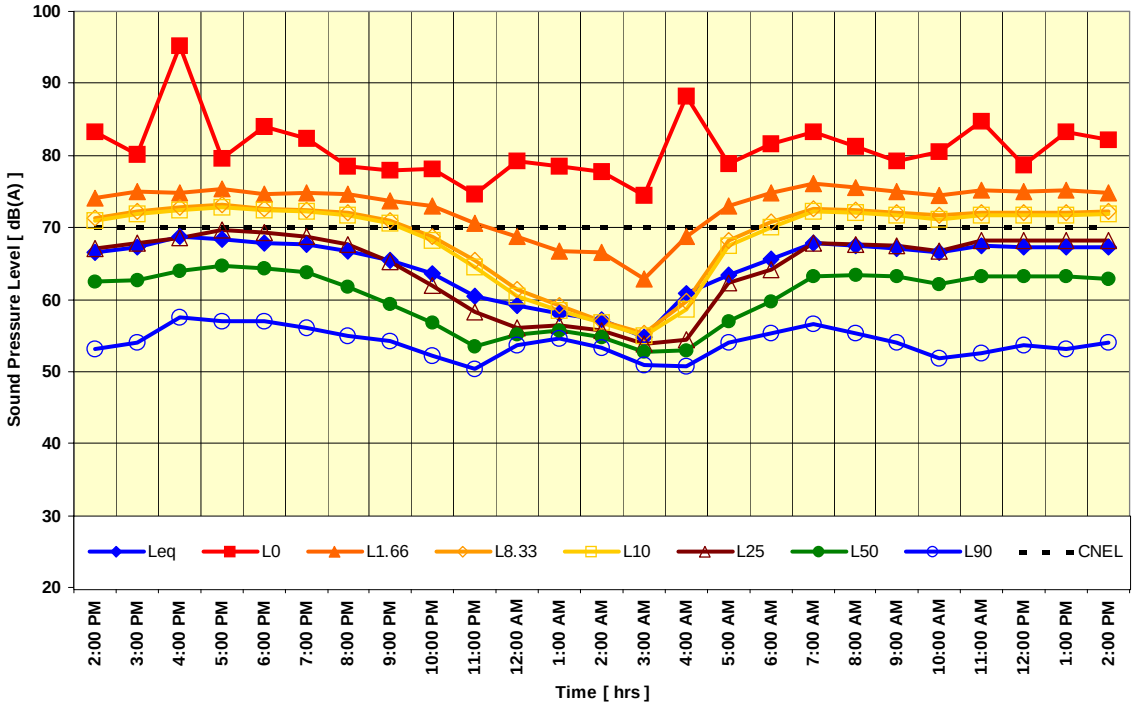
Figure 1: South Side Noise Survey (Jan 2001)
Chevron Gate 20, Mic 1-1 (Top Graphic)
3600 Pine Ave., Manhattan Beach, Mic 1-2 (Bottom Graphic)



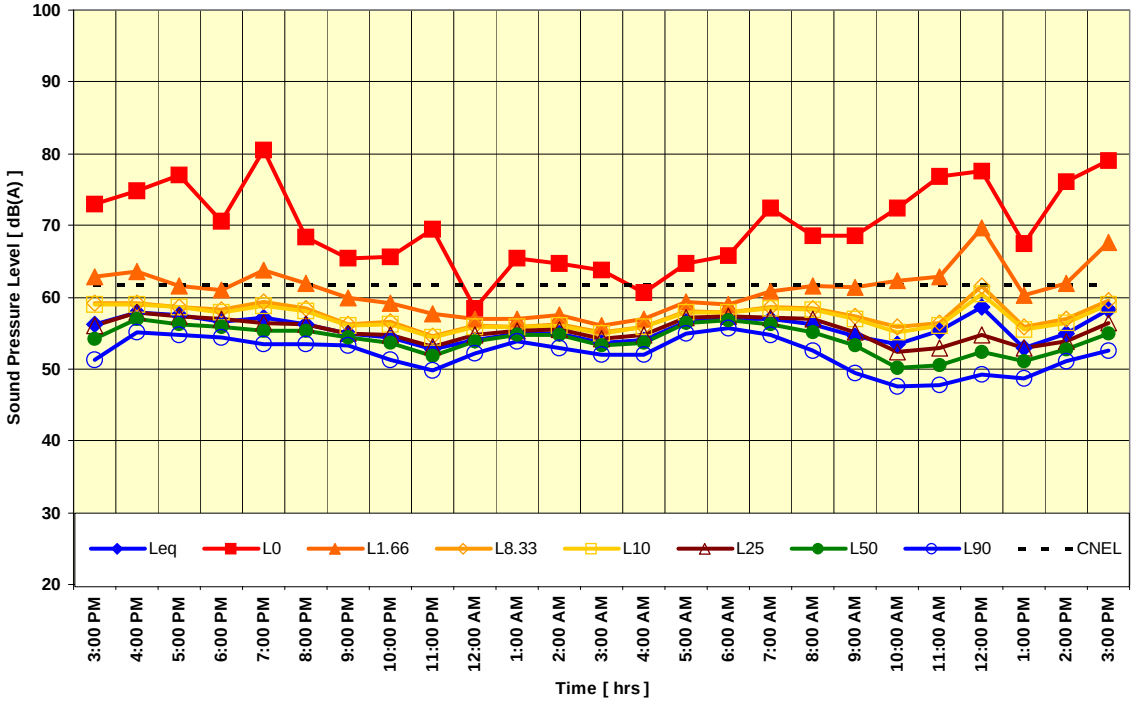


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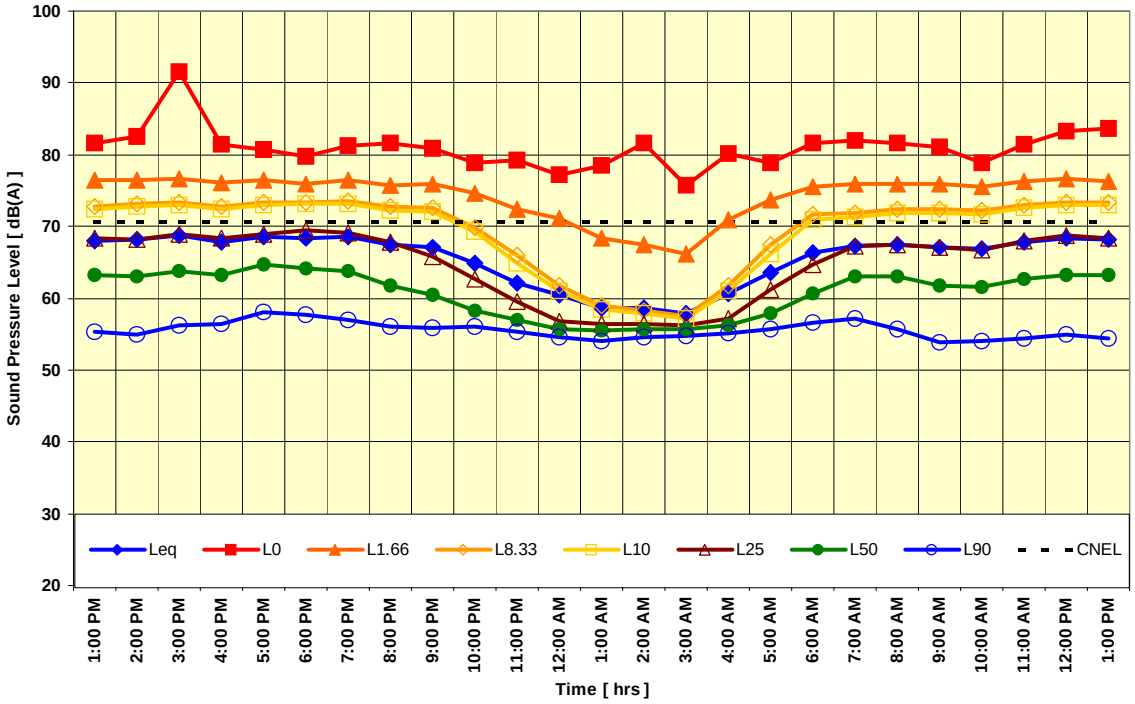
Figure 2: South Side Noise Survey (Jan 2001)
Chevron Gate 21, Mic 2-1 (Top Graphic)
3213 Pacific Ave., Manhattan Beach, Mic 2-2 (Bottom Graphic)



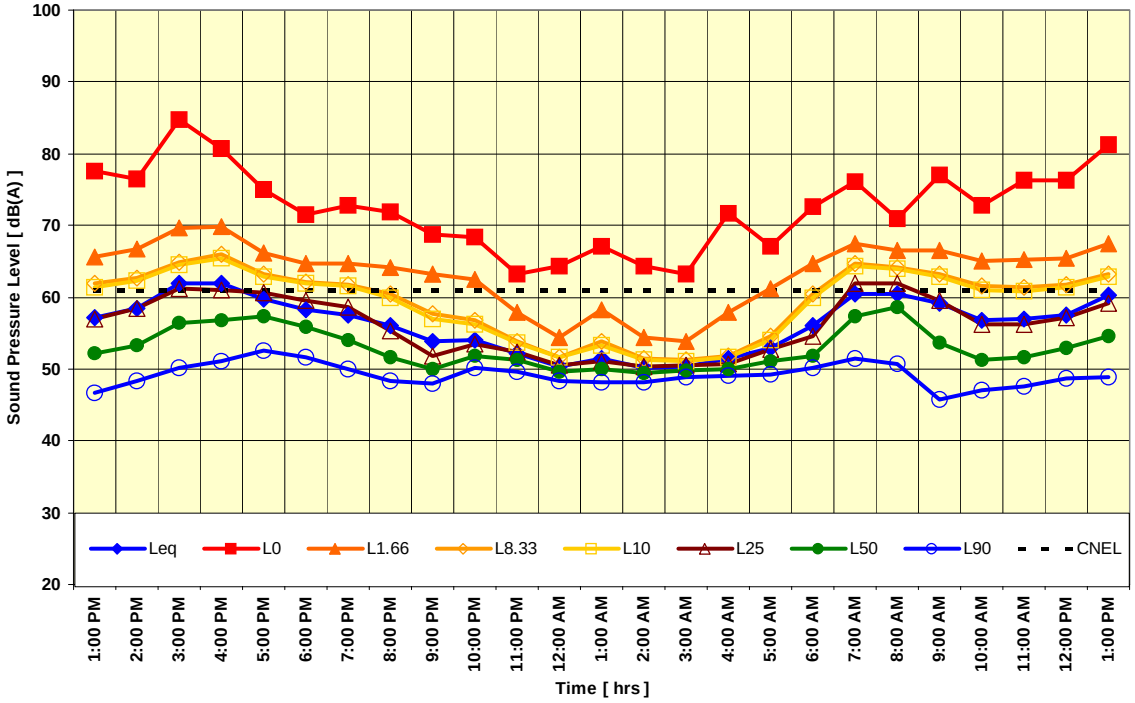


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Figure 3: South Side Noise Survey (Jan 2001)
Chevron Gate 22, Mic 3-1 (Top Graphic)
3601 Bell Ave., Manhattan Beach, Mic 3-2 (Bottom Graphic)