

APPENDIX D

NOISE IMPACT ASSESSMENT

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Navcon Engineering Report No. 143110d (Rev D)

NOISE IMPACT ASSESSMENT

for the

Tesoro LA Refinery Integration and Compliance Project

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1.0 INTRODUCTION

This report documents the results of the Tesoro Refining & Marketing Company, LLC Los Angeles Refinery Integration and Compliance Project (Project) noise impact assessment. The principal objectives were as follows:

1. To determine whether the noise impact during the facility construction will exceed the Project's thresholds of significance, and
2. To determine whether noise impact associated with the operation of the new equipment will exceed the Project's thresholds of significance (refer to **Section 4.1**).

The noise impact assessment included the following tasks:

1. An environmental noise survey was conducted to document the current ambient noise environment in the residential communities closest to the refinery (refer to **Section 4.2**).
2. A three dimensional acoustical model was developed to predict the residential noise impact from the construction activities and from the operation of the new equipment (refer to **Section 4.3**).
3. A noise impact assessment was conducted by comparing the noise levels predicted from the construction activities and operation of the new equipment the thresholds of significance (refer to **Section 4.4**).

The noise impact assessment project was conducted by Hans Forschner and Jim Steedman of Navcon Engineering under the direction of Debbie Bright Stevens, Senior Vice President, Environmental Audit Inc.

2.0 TESORO LA REFINERY INTEGRATION AND COMPLIANCE PROJECT OVERVIEW

The purpose of the Tesoro LA Refinery Integration and Compliance Project is to further integrate the Tesoro Wilmington Operations with the Tesoro Carson Operations. As part of the proposed project the operation of the adjacent facilities will be redesigned to comply with federally mandated Tier 3 gasoline specification and State and local regulations mandating emission reductions.

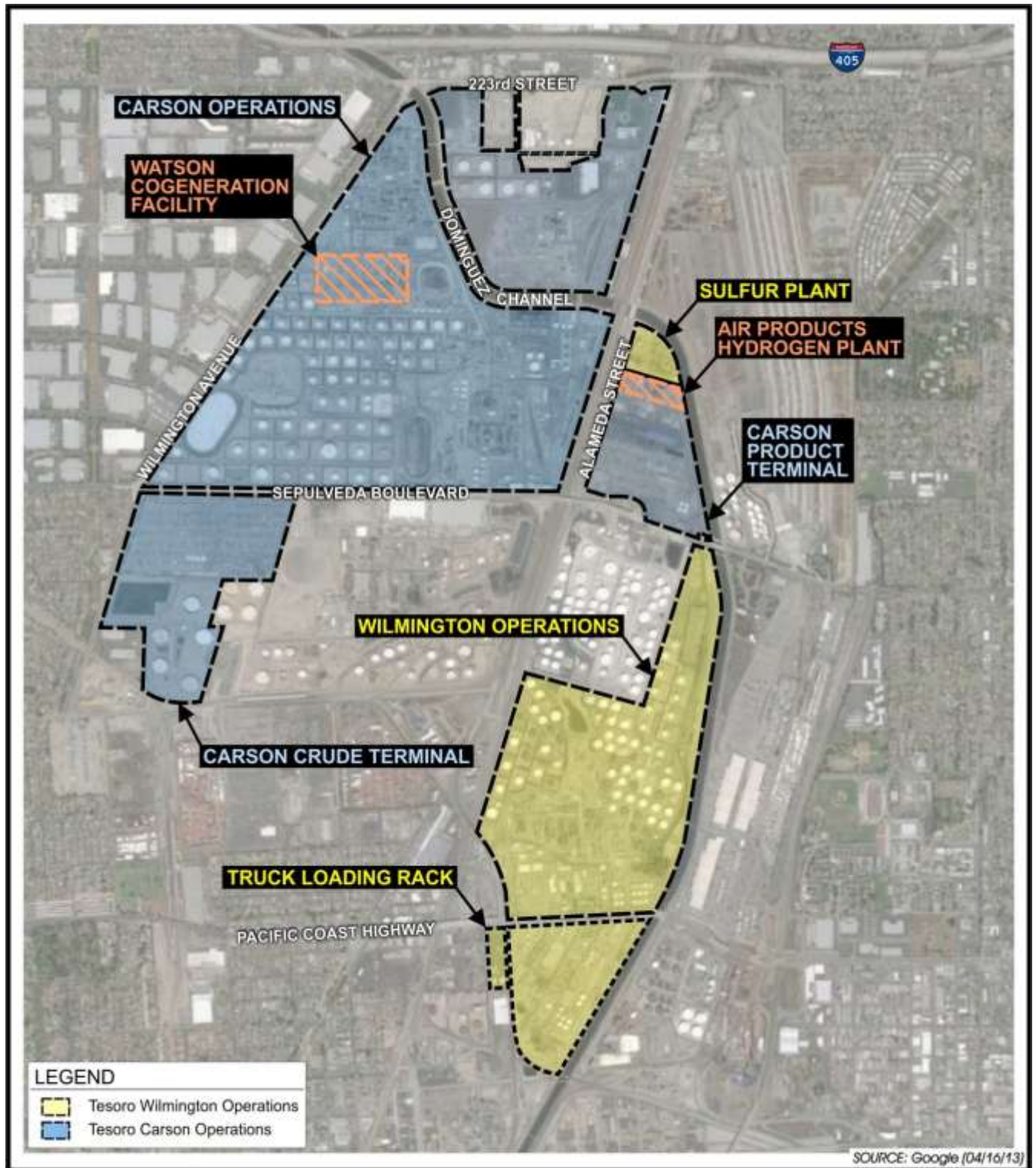
The Tesoro Wilmington Operations is located within Wilmington, a community under the jurisdiction of the City of Los Angeles, at 2101 East Pacific Coast Highway, Wilmington, Los Angeles County, California 90744. The Tesoro Carson Operations is located at 2350 E 223rd Street, Carson, California, 90745. **Aerial Photo 2-1** depicts the Site Location Map. Both new and modified equipment, as well as connecting piping, will be located within portions of the Refinery under both the City of Carson jurisdiction and the City of Los Angeles jurisdiction.

The Wilmington Operations are bounded to the north by Sepulveda Boulevard, to the west by Alameda Street, to the south by railroad tracks, and to the east by the Dominguez Channel (see **Aerial Photo 2-1**). The Wilmington Operations are bisected by Pacific Coast Highway, with the larger portion of the Wilmington Operations to the north of Pacific Coast Highway and the smaller portion to the south. The Refinery and all adjacent areas are zoned for heavy industrial use (M3-1).

The Carson Operations are bounded by Wilmington Avenue to the west, 223rd Avenue to the north, Alameda Street to the east, and Sepulveda Boulevard to the south. The Dominguez Channel flows through the Carson Operations, dividing the property into two sections: Northeastern and Southern (see **Aerial Photo 2-1**). Several industrial/commercial facilities and the 405 Freeway border the Carson Operations to the north. The Alameda Corridor and other industrial facilities, including the Tesoro Coke Barn, the Air Products Hydrogen Plant, and the Tesoro Sulfur Plant, are located to the east of the Carson Operations. Commercial and residential areas are located to the west of the Carson Operations. The Phillips 66 Refinery and tank farms occupy the area located to the south of the Tesoro Carson Operations.

The Carson Operations and all adjacent properties are zoned manufacturing heavy (MH). The closest residential area to the Carson Operations is approximately 250 feet southwest of the Refinery on the southwest corner of the Sepulveda Boulevard/Wilmington Avenue intersection.

Aerial Photo 2-1, Site Plan (Source: Environmental Audit)



3.0 EXECUTIVE SUMMARY

The principal objective of this study was to assess whether the Tesoro LA Refinery Integration and Compliance Project will result in a significant noise impact to the surrounding communities based upon the project's thresholds of significance. The project's thresholds of significance were derived from the project's applicable noise regulations.

The results of the noise analysis concluded that:

- The proposed Tesoro LA Refinery Integration and Compliance Project construction noise will not represent a significant noise impact to the residential communities.
- The proposed Tesoro LA Refinery Integration and Compliance Project operations noise will not represent a significant noise impact to the residential communities.

4.0 ENVIRONMENTAL NOISE

4.1 Noise Impact Assessment Criteria & Thresholds of Significance

The Tesoro LA Refinery Integration and Compliance Project noise impact assessment criteria are based upon the noise metrics, limits, methods and procedures contained in the City of Los Angeles Municipal Code, the City of Los Angeles Noise Element, the City of Carson Municipal Code, the California Department of Health Services, the Federal Rail Administration, and the Federal Highway Administration. The regulations and codes are described in detail in Tesoro LA Refinery Integration and Compliance Project EIR.

The Tesoro LA Refinery Integration and Compliance Project noise impact assessment was conducted by applying the most stringent limits from each of the regulations listed above. The Project noise limits are described in three thresholds of significance.

NOI-1 Construction of the proposed Project would have a significant noise impact if construction noise levels exceed the local noise ordinances, or if the noise ordinance is currently exceed, if ambient Community Noise Exposure Levels (CNEL) would be increased by three (3) dBA or more at a noise sensitive receptor during the construction period.

NOI-2 Operation of the proposed project would have a significant noise impact if proposed project operational noise levels exceed any of the local noise ordinances at the site boundary or, if the noise threshold is currently exceed, ambient CNEL noise levels would be increased by three (3) dBA or more at a noise sensitive receptor.

NOI-3 Operation of the new equipment would have a significant noise impact if Daytime ambient noise level (Leq,day) or Nighttime ambient noise level (Leq,night) would be increased by three (3) dBA or more at a noise sensitive receptor.

4.2 Environmental Noise Survey

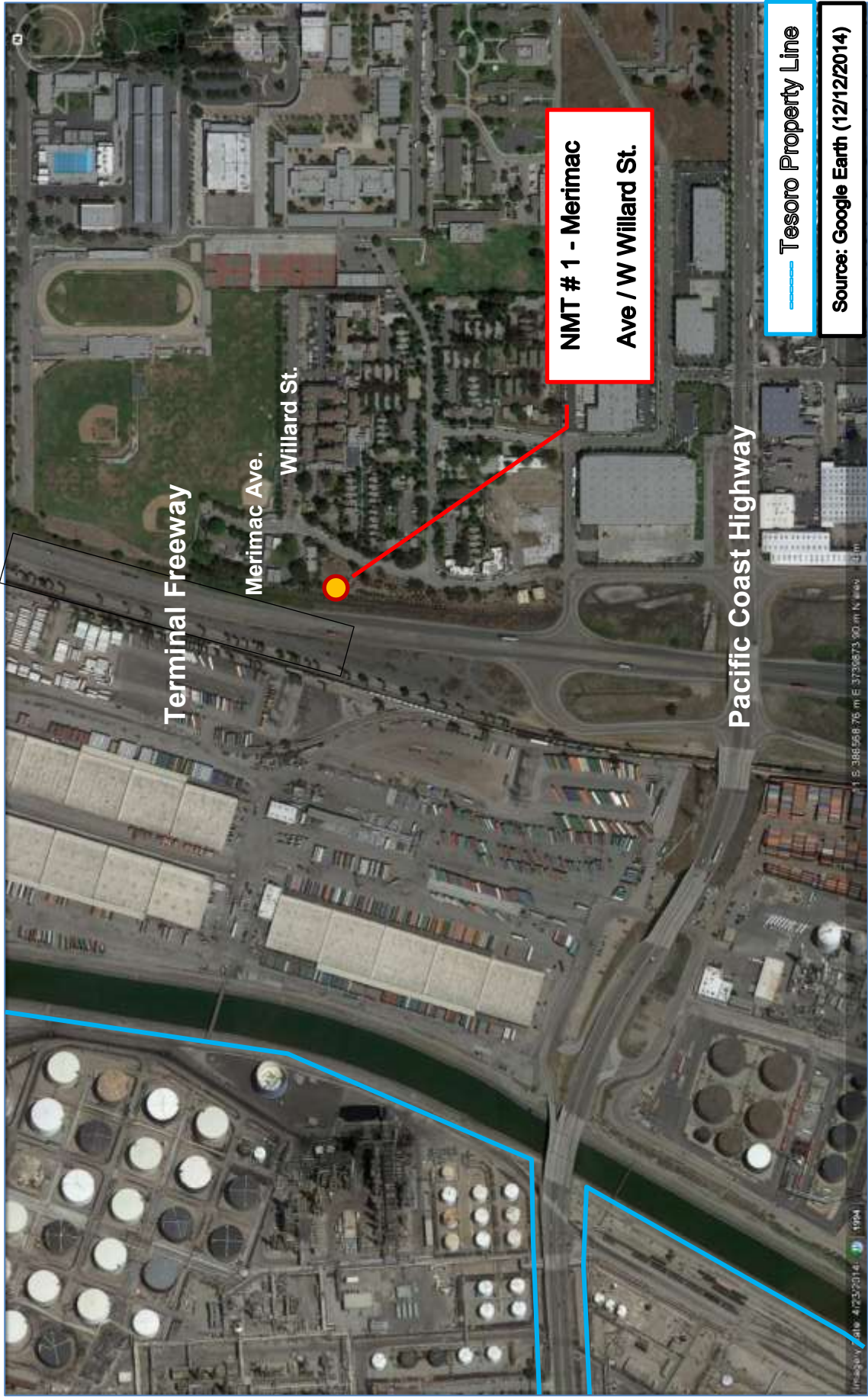
Environmental noise surveys were conducted to characterize the existing ambient noise environment. No immediate residential communities are located to the North or North-East of the facilities. The surveys were conducted between August 29th, 2014 and September 18th, 2014 and focused on the closest residential communities located to the South-East, South-West and West of the Tesoro Refineries.

The noise monitoring locations are shown in **Aerial Photo 4-1**, **Aerial Photo 4-2**, **Aerial Photo 4-3** and **Photo 4-1** through **Photo 4-4**. The noise data was collected using stationary noise monitoring terminals (NMT). Each NMT was placed in a weatherproof enclosure and collected data continuously throughout the survey period.

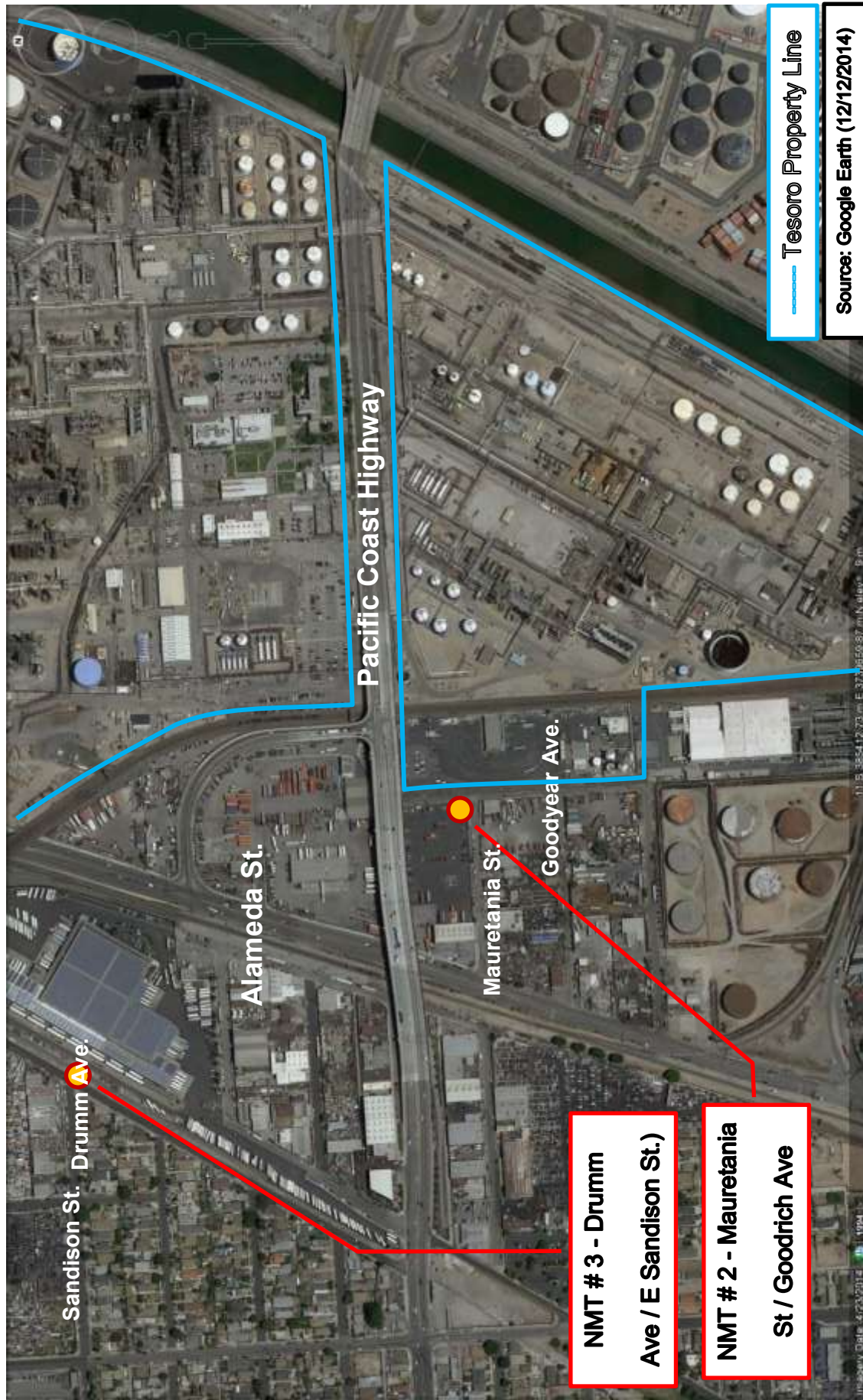
The noise monitoring terminals were based upon Larson Davis (LD) Model 831 sound level analyzers, LD PRM813 pre-amplifiers and 377B02 microphones. The analyzers meet the American National Standards Institute (ANSI) S1.4, 1983 specification for Type I (Precision) sound level meters. The system sensitivities were set immediately prior to each survey using a Bruel & Kjaer (B&K) Type 4230 Sound Level Calibrator. The system sensitivities were checked immediately following each survey using the B&K 4230 calibrator to confirm that the sensitivity had not changed. The NMTs are calibrated on an annual basis in accordance with the National Institute of Standards Technology (NIST).

The hourly Leq and L90 levels are presented in **Graphic 4-1** through **Graphic 4-4**. The daytime noise levels (Ld), evening noise levels (Le), nighttime noise levels (Ln) and community noise equivalent noise levels (CNEL) are presented in **Table 4-1**.

Aerial Photo 4-1, Noise Monitoring Locations (NMT # 1, Sep. 18 - 19, 2014)



Aerial Photo 4-2, Noise Monitoring Locations (NMT # 2, Aug. 31 - Sep. 1, 2014, NMT # 3, Aug. 29 - Aug. 30, 2014)



Aerial Photo 4-3, Noise Monitoring Locations (NMT # 4, August 29 – August 30, 2014)



Photo 4-1 NMT-1 Merimac Ave / W Willard St.



Photo 4-2 NMT-2 Mauretania St / Goodrich Ave.



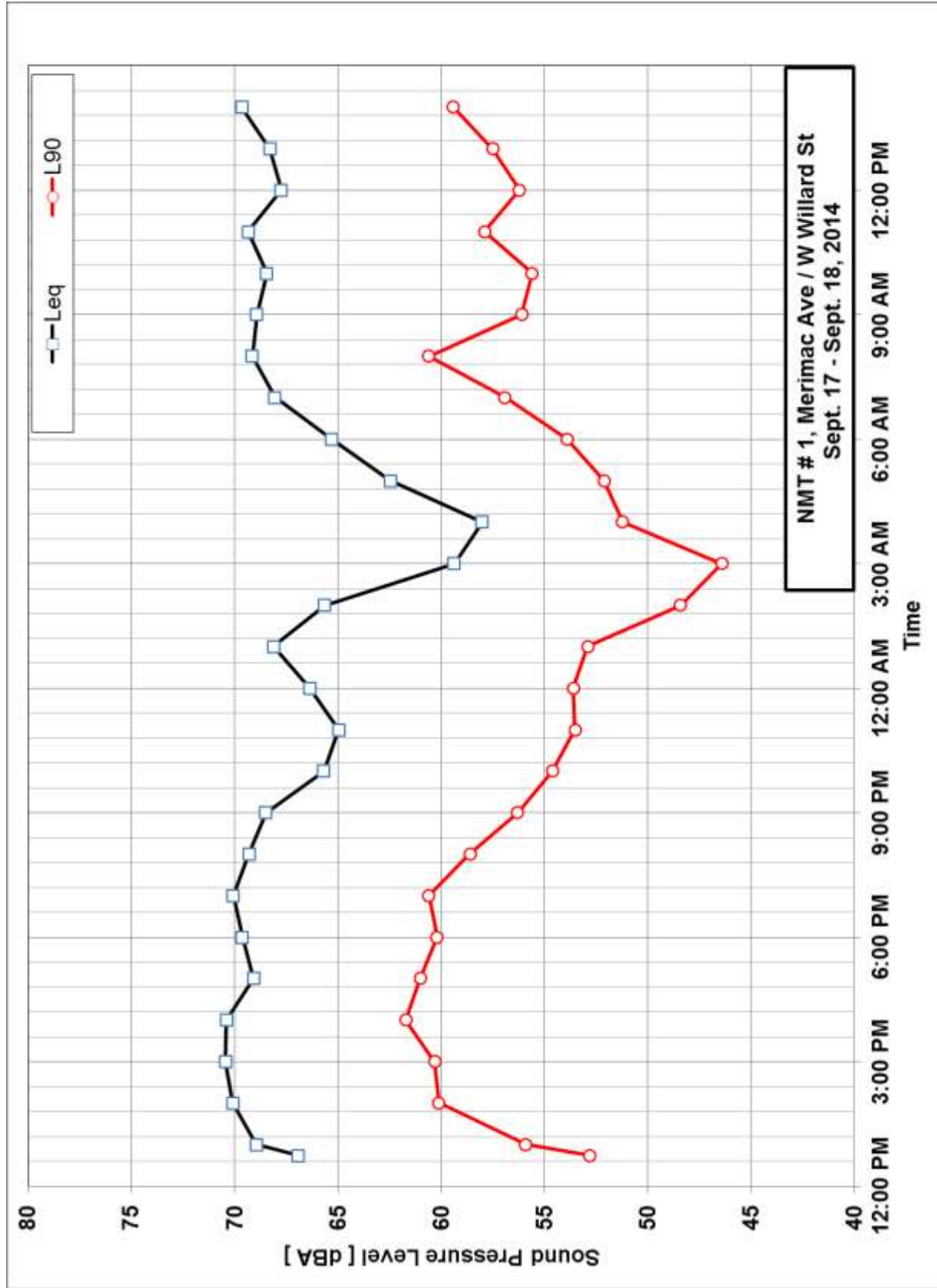
Photo 4-3 NMT-3 Drumm Ave / E Sandison St.



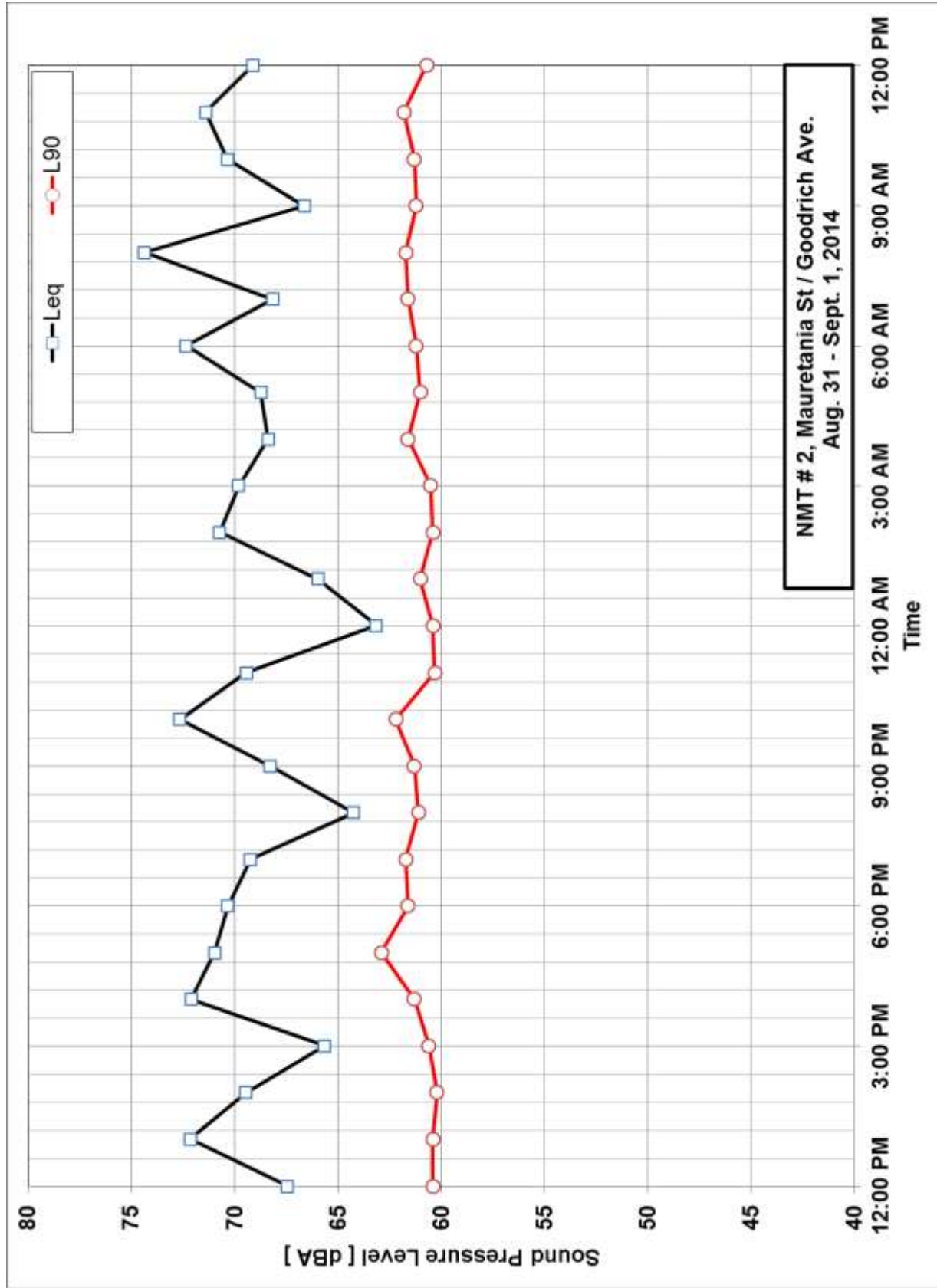
Photo 4-4, NMT-4 Wilmington Ave / E Pacific St.



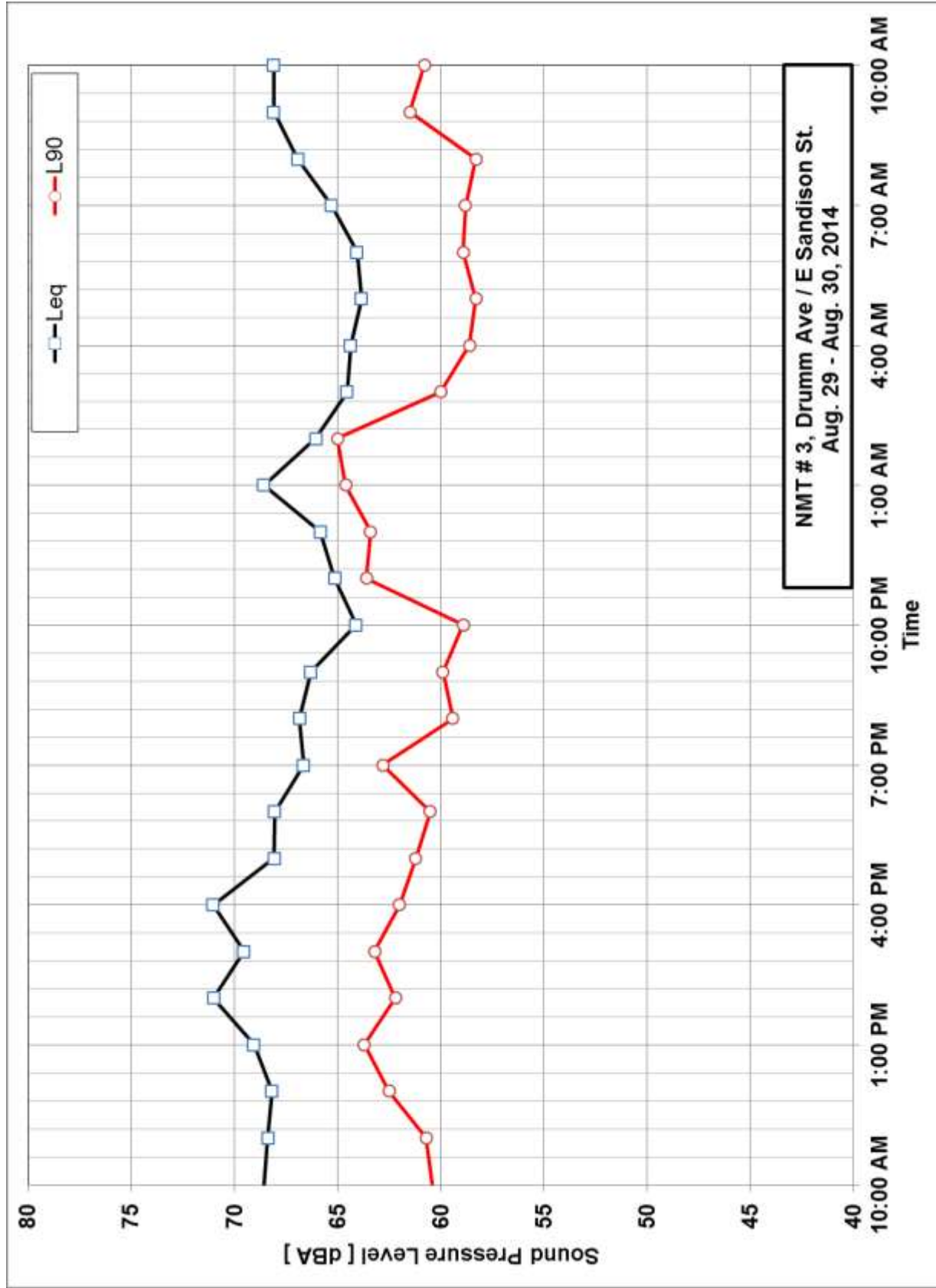
Graphic 4-1 NMT # 1, Merimac Ave / W Willard St. Sound Pressure Level (Sep. 17th - 18th, 2014)



Graphic 4-2 NMT # 2, Mauretania St / Goodrich Ave. Sound Pressure Level (Aug. 31 - Sep. 1, 2014)



Graphic 4-3 NMT # 3, Drumm Ave / E Sandison St. Sound Pressure Level (Aug. 29 - 30, 2014)



Graphic 4-4 NMT # 4, Wilmington Ave / E Pacific St. Sound Pressure Level (Aug. 29 - 30, 2014)

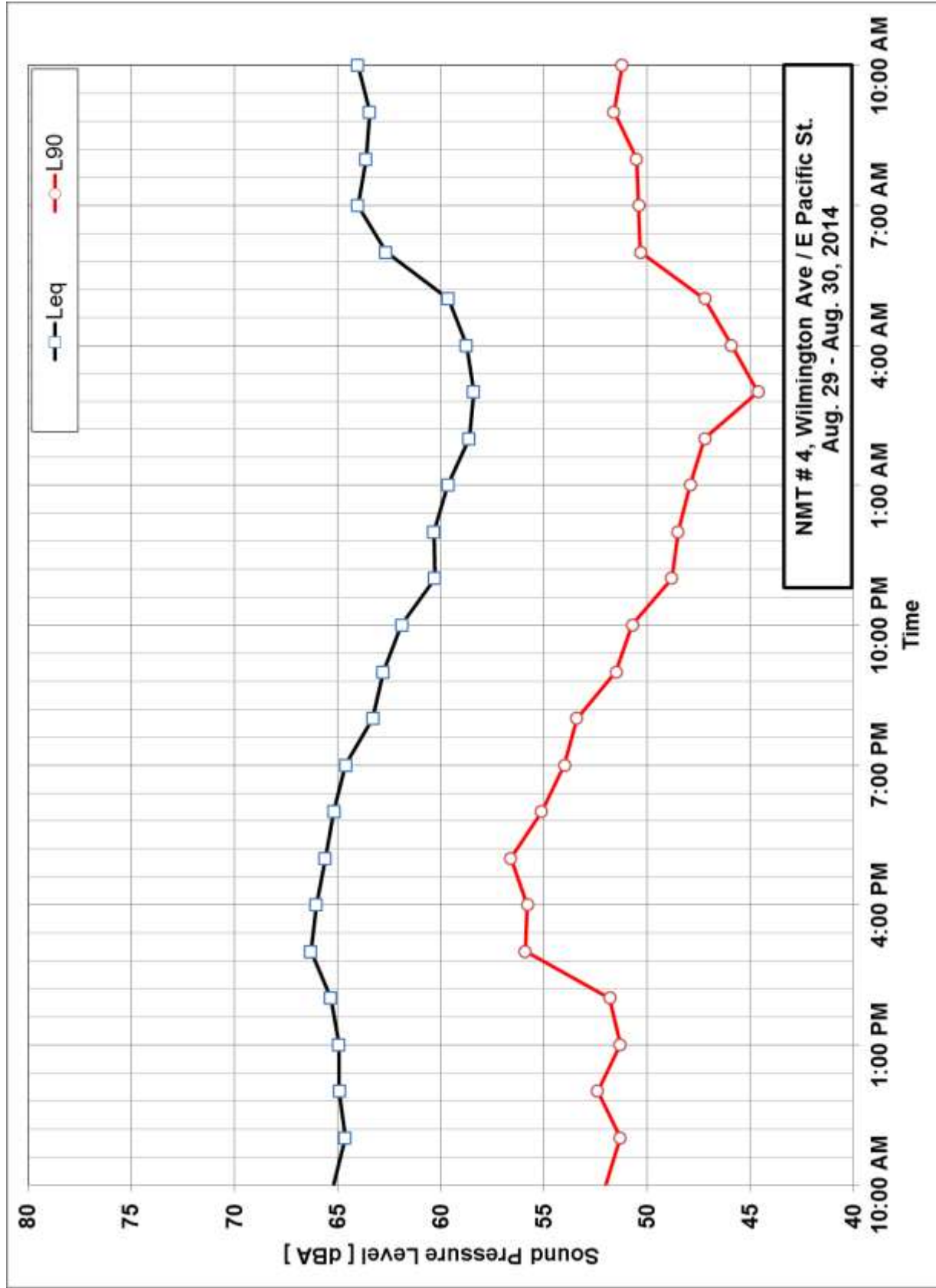


Table 4-1, Noise Monitoring Terminals - Daytime/Evening/Nighttime Levels & CNELs

Time	Average Hourly Leq			
	NMT-1	NMT-2	NMT-3	NMT-4
00:00:00	66.4	63.1	65.8	60.3
01:00:00	68.1	66.0	68.6	59.6
02:00:00	65.6	70.7	66.0	58.6
03:00:00	59.4	69.8	64.5	58.4
04:00:00	58.0	68.4	64.4	58.8
05:00:00	62.5	68.7	63.8	59.6
06:00:00	65.3	72.3	64.1	62.7
07:00:00	68.0	68.2	65.3	64.0
08:00:00	69.1	74.4	66.9	65.8
09:00:00	68.9	66.6	68.1	64.9
10:00:00	68.4	70.3	68.5	65.2
11:00:00	69.3	71.4	68.4	64.6
12:00:00	67.7	67.4	68.2	64.9
13:00:00	68.3	72.1	69.1	64.9
14:00:00	70.1	69.5	71.0	65.3
15:00:00	70.4	65.6	69.5	66.3
16:00:00	70.4	72.1	71.0	66.0
17:00:00	69.1	71.0	68.1	65.6
18:00:00	69.6	70.3	68.0	65.2
19:00:00	70.1	69.2	66.6	64.6
20:00:00	69.3	64.2	66.8	63.3
21:00:00	68.5	68.3	66.3	62.8
22:00:00	65.7	72.7	64.1	61.9
23:00:00	65.0	69.4	65.1	60.3
CNEL	72.8	76.4	72.7	68.2
Ldn	72.3	76.3	72.4	67.7
Leq,day	68.2	69.6	67.8	64.3
Leq,even	62.3	60.7	59.6	56.6
Leq,night	64.9	69.8	65.4	60.3

CNEL = The Community Noise Equivalent Level (average level with 5 dB penalty added between 7 pm and 10 pm and a 10 dB penalty added between 10 pm and 7 am)

Ldn = Day/Night Noise Equivalent Level (average level with a 10 dB penalty added between 10 pm and 7 am)

Leq,day = The Daytime averaged sound pressure level (averaged 7 am to 7 pm)

Leq,even = The Evening averaged sound pressure level (averaged 7 pm to 10 pm)

Leq,night = The Nighttime averaged sound pressure level (averaged 10 pm to 7 am)

4.3 Acoustical Noise Models

The Tesoro LA Refinery Project noise impact was determined by (1) developing three dimensional noise models of the Project, (2) predicting the Project noise levels at the selected community locations and (3) comparing the predicted the noise with the existing community ambient noise levels at the locations described in **Section 4.2**.

The noise models were developed using the noise modeling software, SoundPLAN™. SoundPLAN™ is a standards based program with more than twenty national and international noise modeling guidelines. The following noise prediction standards were used during the performance of this project:

- ISO 9613-1, Acoustics - Attenuation of sound during propagation outdoors - Part 1: Calculation of the absorption of sound by the atmosphere
- ISO 9613, Acoustics -- Attenuation of sound during propagation outdoors - Part 2, Acoustics - Attenuation of Sound During Propagation Outdoors

The noise model geometry is presented in **Figure 4-1** through **Figure 4-7**. The sides of the tanks, containers, buildings, etc. were modeled as reflective surfaces and also as diffractive bodies (the yellow and gray shaded surfaces). The Noise Sources are shown as red spheres (point sources) and red surfaces (area sources). A light blue line outlines the perimeter of each operation. The surrounding roads are displayed as grey surfaces. Most of the ground within the refinery and adjacent areas are covered with gravel, concrete or asphalt. Therefore, it was modeled as a hard reflective surface with an absorption coefficient of 0.25.

Construction Noise Model:

- The Project will include 23 construction activities scheduled over a 5 year period. The Construction Noise Model represents a worst case scenario by assuming that all construction activities are performed at the same time.
- The construction equipment noise emission levels were based upon FHWA Roadway Construction Noise Model (RCNM Manual).

- The construction equipment was modeled as a line of stationary point sources along the pipe-ways. The noise level predicted from each point source location and the maximum predicted was used for the noise impact assessment.
- During plant operation the construction activities were assumed to take place during a single twelve hour work shift (7 am to 7 pm). During project related shutdowns / turnarounds, the construction activities were assumed to be conducted during two twelve hour shifts (i.e., 24 hours per day).

Operational Noise Model:

- The operational noise model includes all new noise producing equipment.
- The sound power emission levels of the new equipment were estimated using the equipment dimensions (L x W x H) and a sound pressure level of 85 dBA at a distance of 3 foot. The equipment dimensions were provided by Tesoro engineers. Refineries in general are specifying an 85 dBA noise limit for all new equipment. The 85 dBA noise limit originates from the regulation set forth by the Occupational Safety Health Administration (OSHA).

The detailed noise model input data is presented in **Section 5.0, Appendix A, Three Dimensional Noise Model Input Data**.

Figure 4-1 Model Geometry with Topo Data - 3D View Wilmington Operation from South

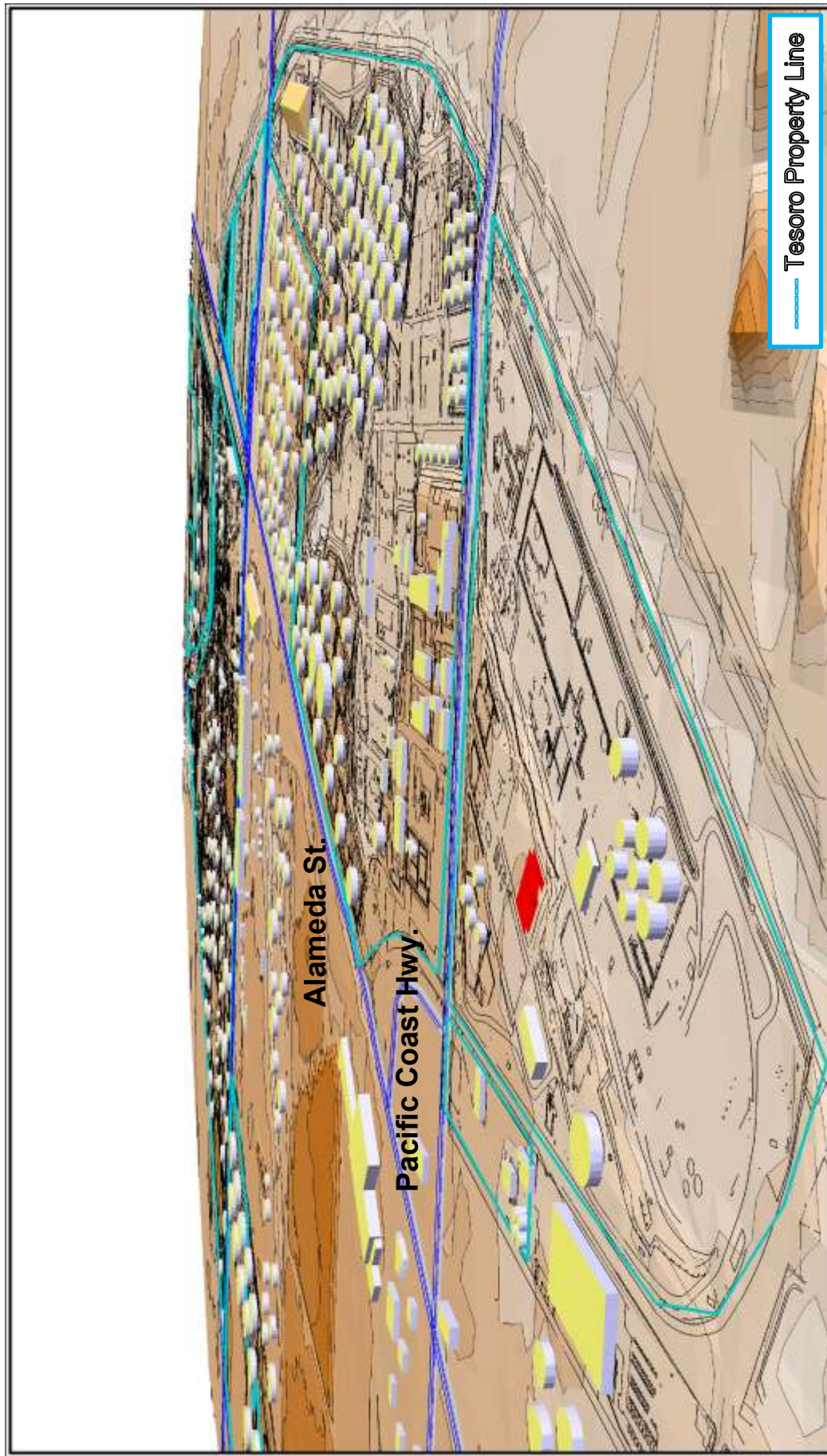


Figure 4-2 Model Geometry with Topo Data - 3D View Wilmington Operation from North

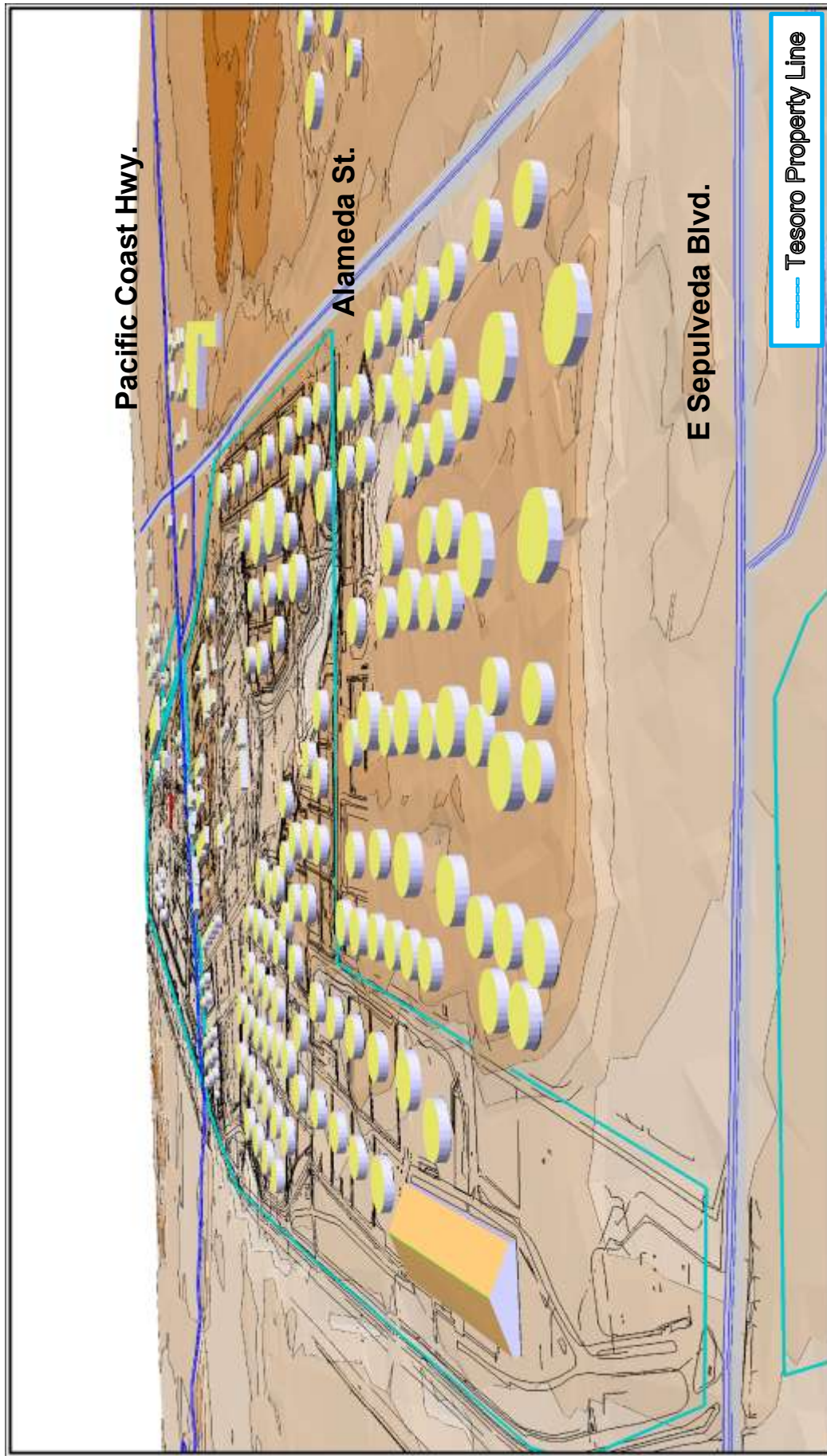


Figure 4-3 Model Geometry with Topo Data - 3D View Carson Operation from South West

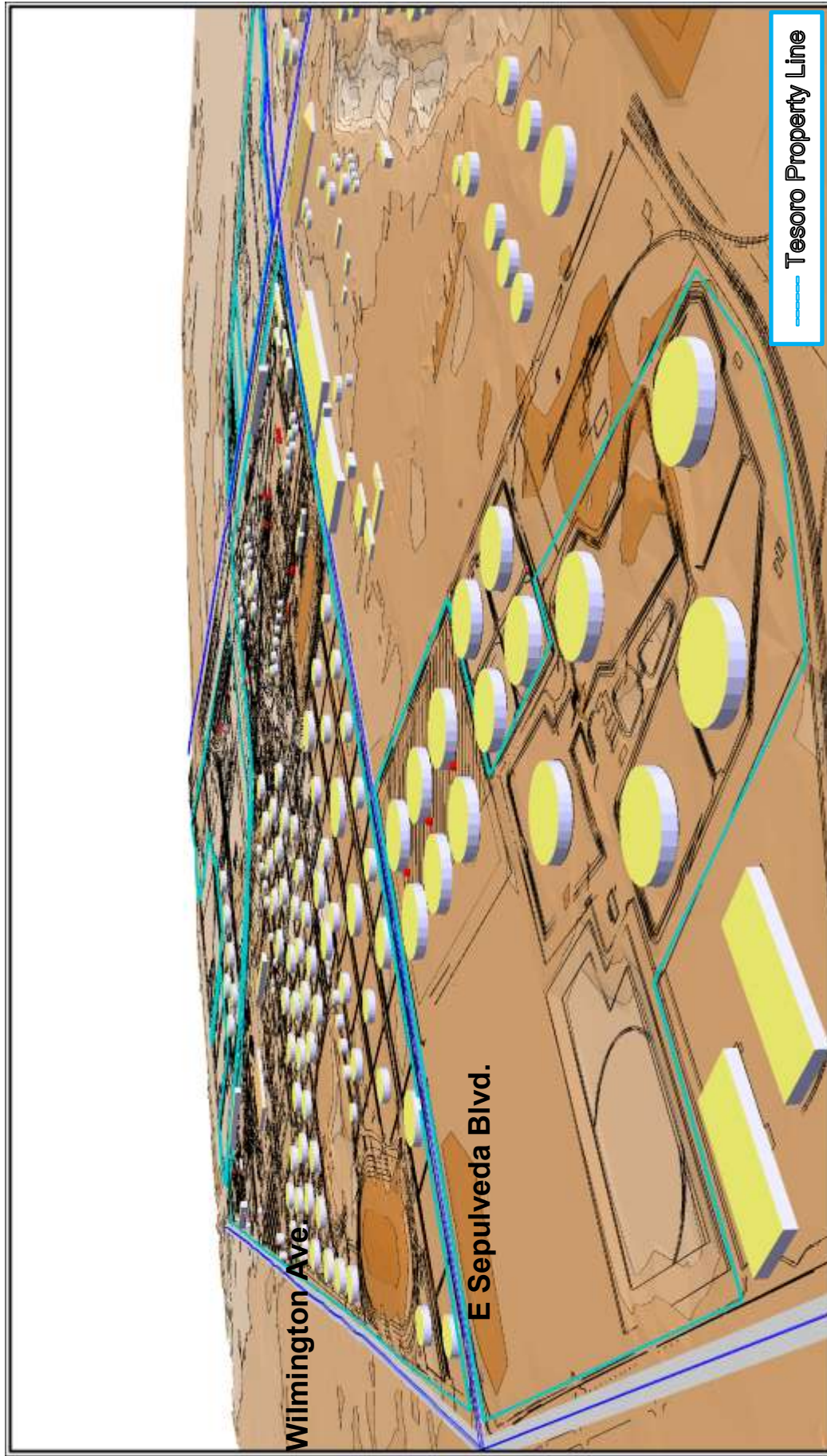


Figure 4-4 Model Geometry with Topo Data - 3D View Carson Operation from South East

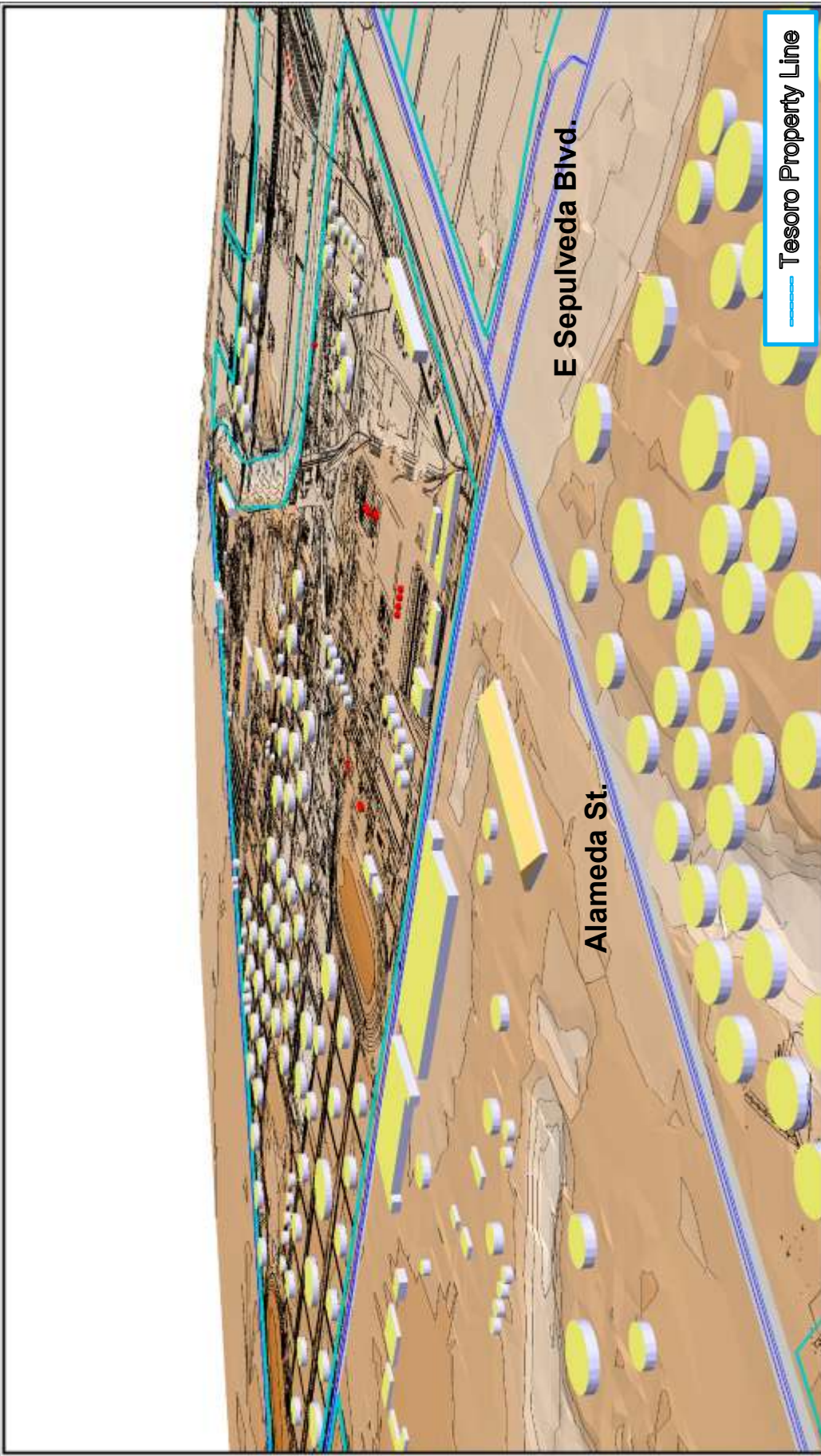


Figure 4-5 Model Geometry with Topo Data - 3D View Carson Operation from East

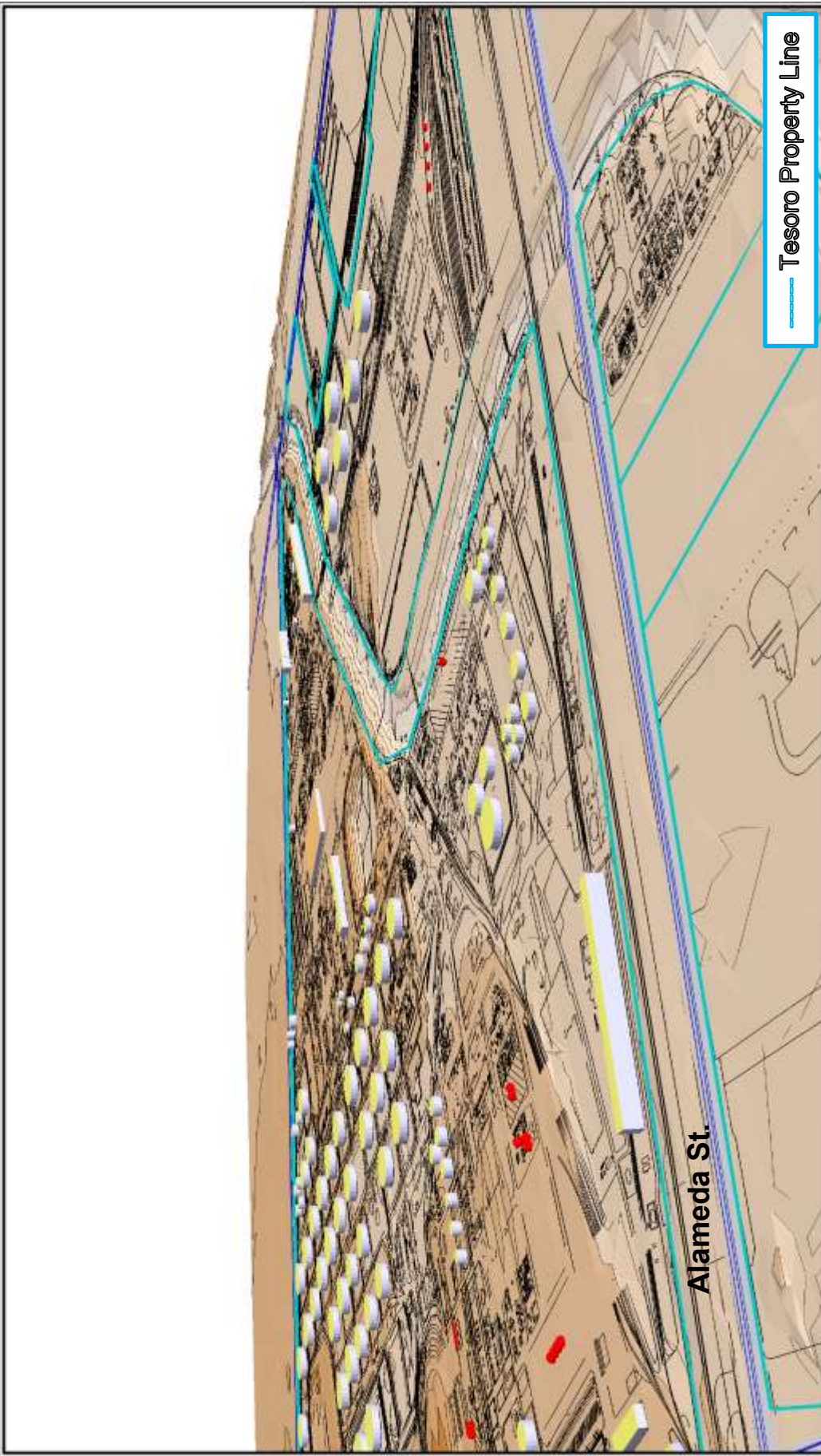


Figure 4-6 Model Geometry Construction Tesoro Refinery (Carson, Wilmington) - 2D View



Figure 4-7 Model Geometry New Equipment Tesoro Refinery (Carson, Wilmington) - 2D View



4.4 Acoustical Noise Model Assessment

The 3D acoustical model was used to generate noise contour maps over the refinery property and adjacent residential communities.

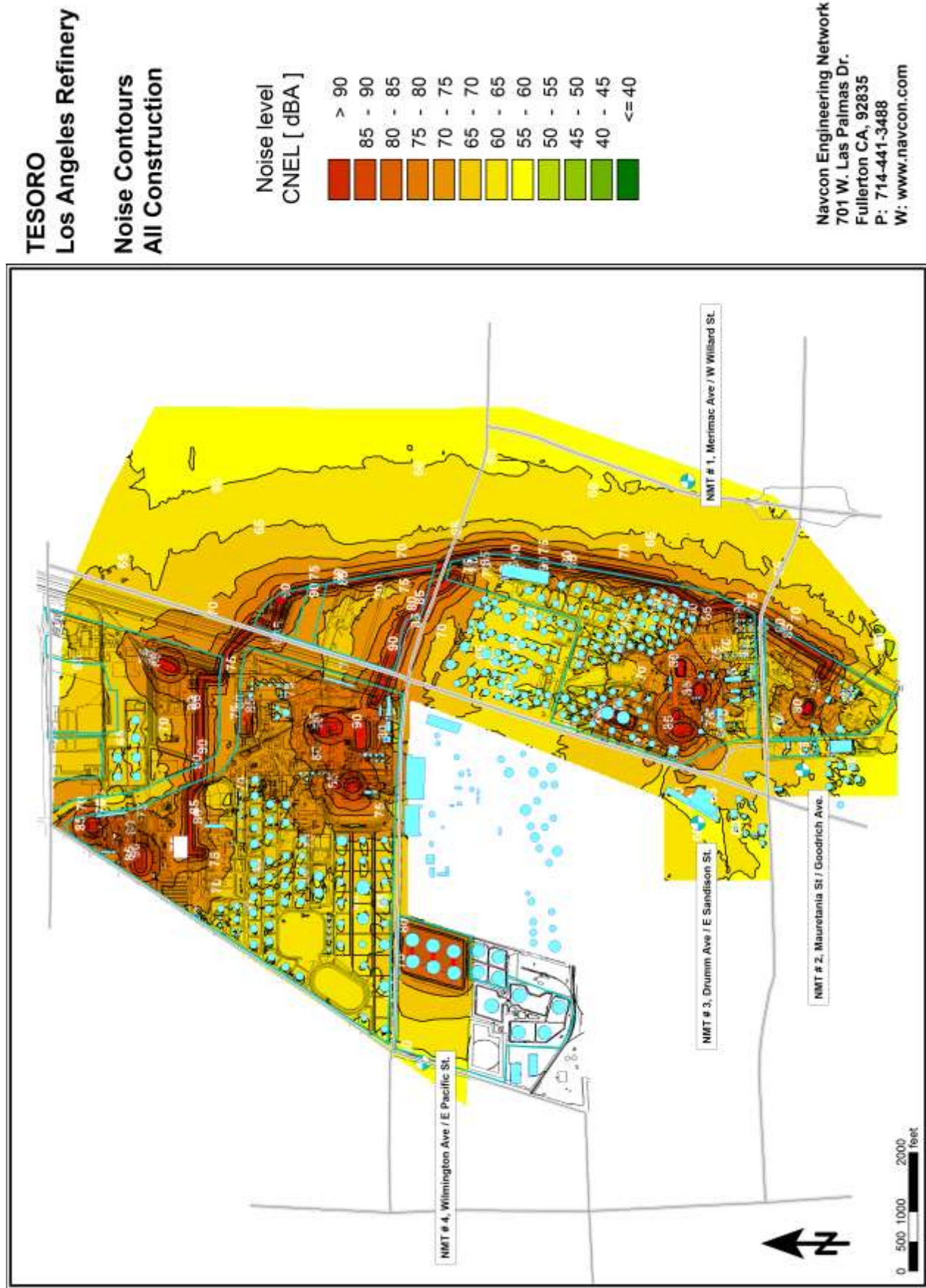
- The Plant Construction Noise contours are shown in **Noise Map 4-1**, **Noise Map 4-2** and **Noise Map 4-3** (CNEL, Leq,day, Leq,night respectively).
- The Plant Operational Noise contours are shown in **Noise Map 4-4** and **Noise Map 4-5** (CNEL and Leq,day/Leq,night respectively).

The 3D acoustical model was used to predict the noise level at the four sensitive receptor locations.

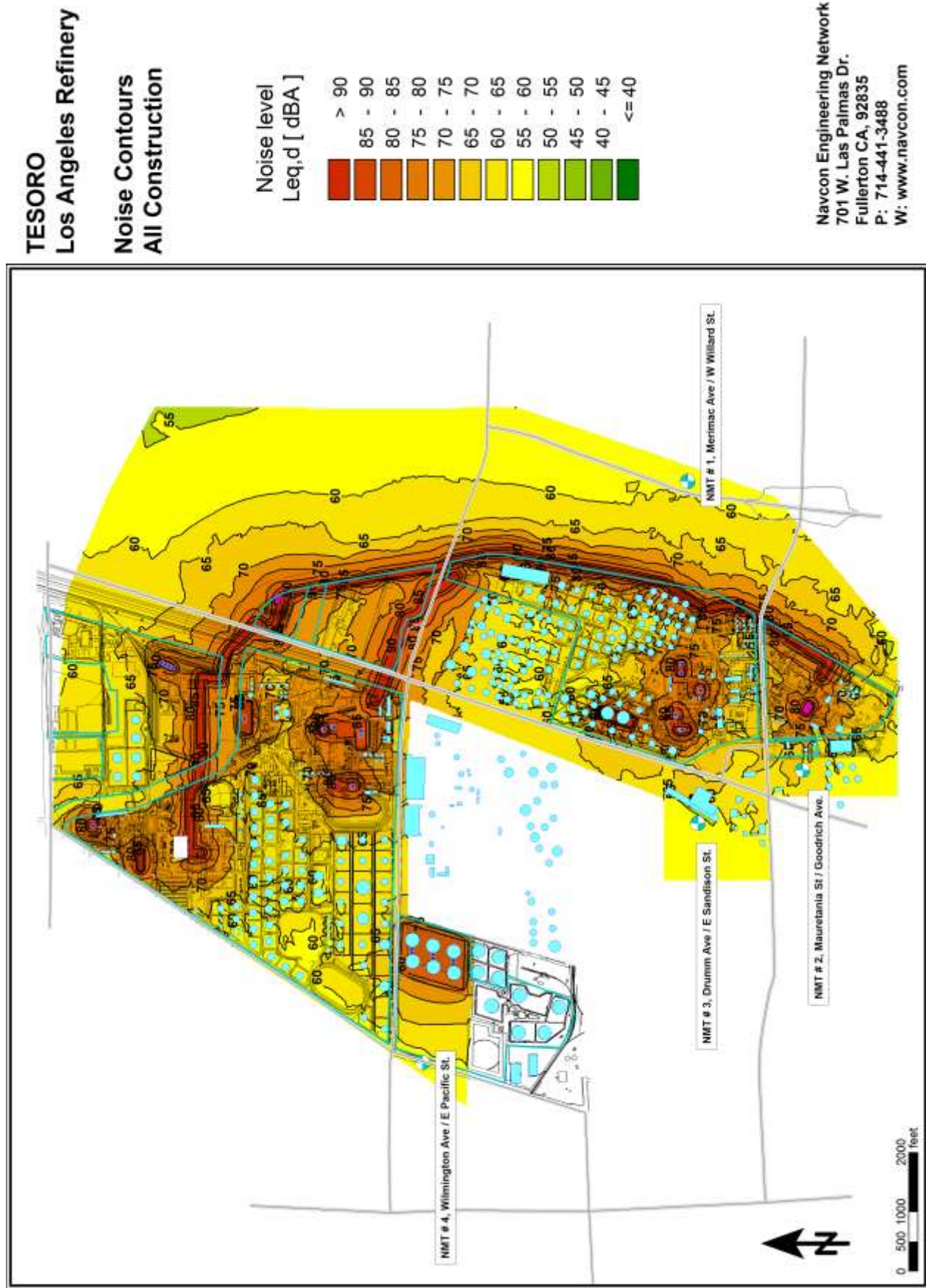
- The sensitive receptor locations are listed in **Table 4-2**.
- The change in noise level predicted during the Plant Construction is listed in **Table 4-3**.
- The change in noise level predicted during the Plant Operation is listed in **Table 4-4**.

The noise level predictions indicate that the Tesoro LA Refinery Integration and Compliance Project are below all of the significance thresholds and do not exceed any of the significance thresholds.

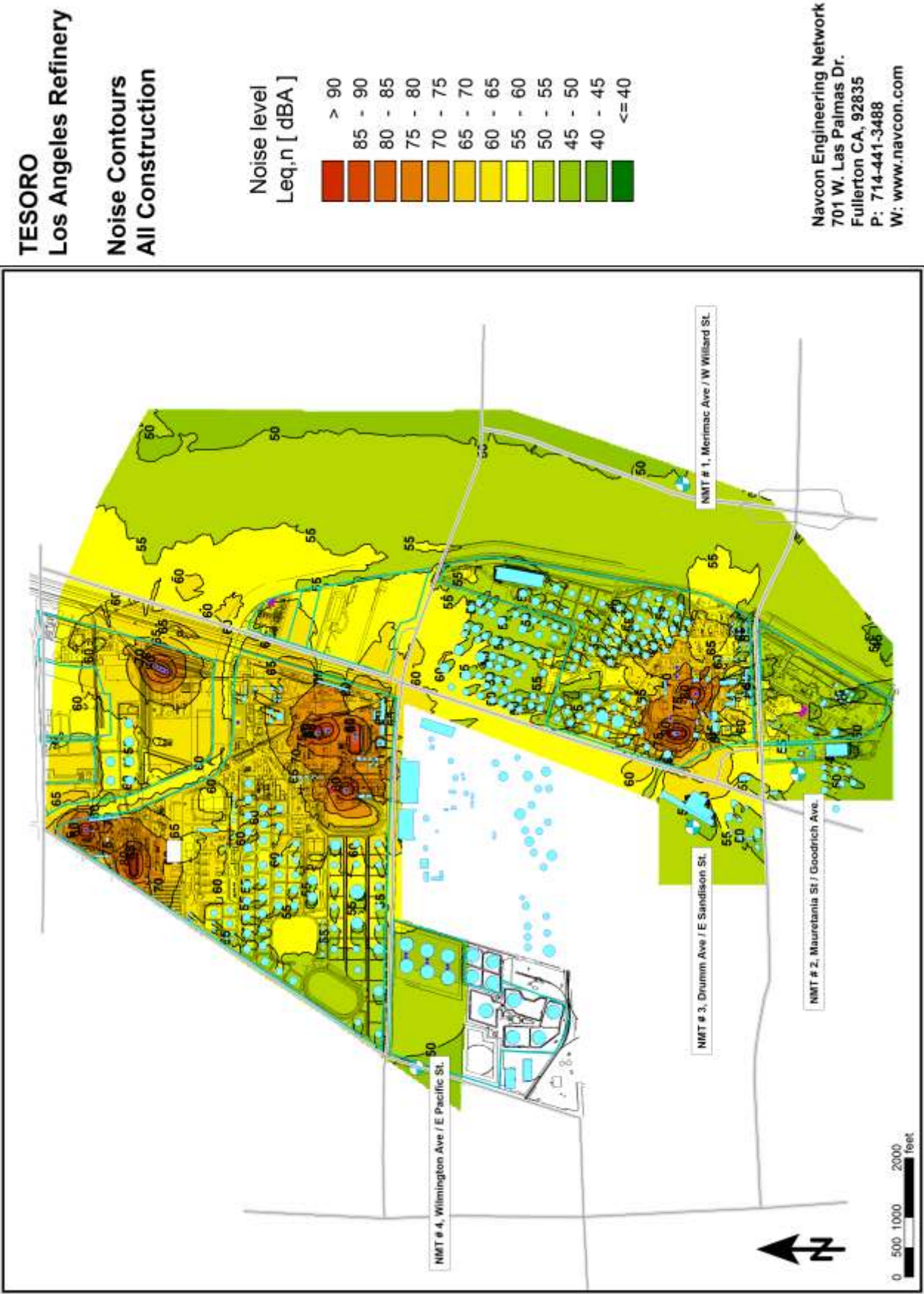
Noise Map 4-1 Plant Construction CNEL Contours



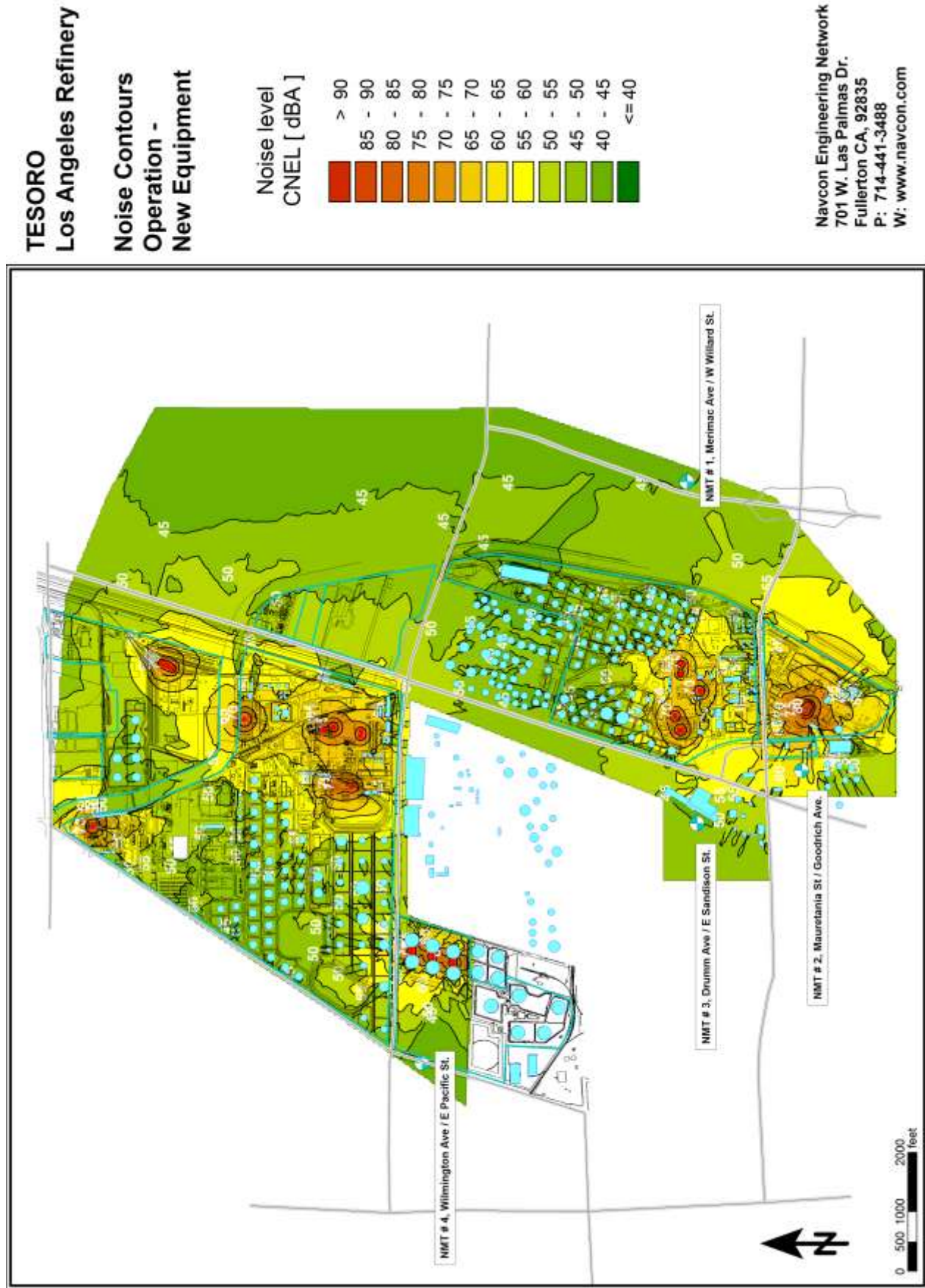
Noise Map 4-2 Plant Construction Leq,day Contours



Noise Map 4-3 Plant Construction Leq,night Contours



Noise Map 4-4, Plant Operation CNEL Contours (New Equipment Only)



Noise Map 4-5, Plant Operation Leq,day / Leq,night Contours (New Equipment Only)

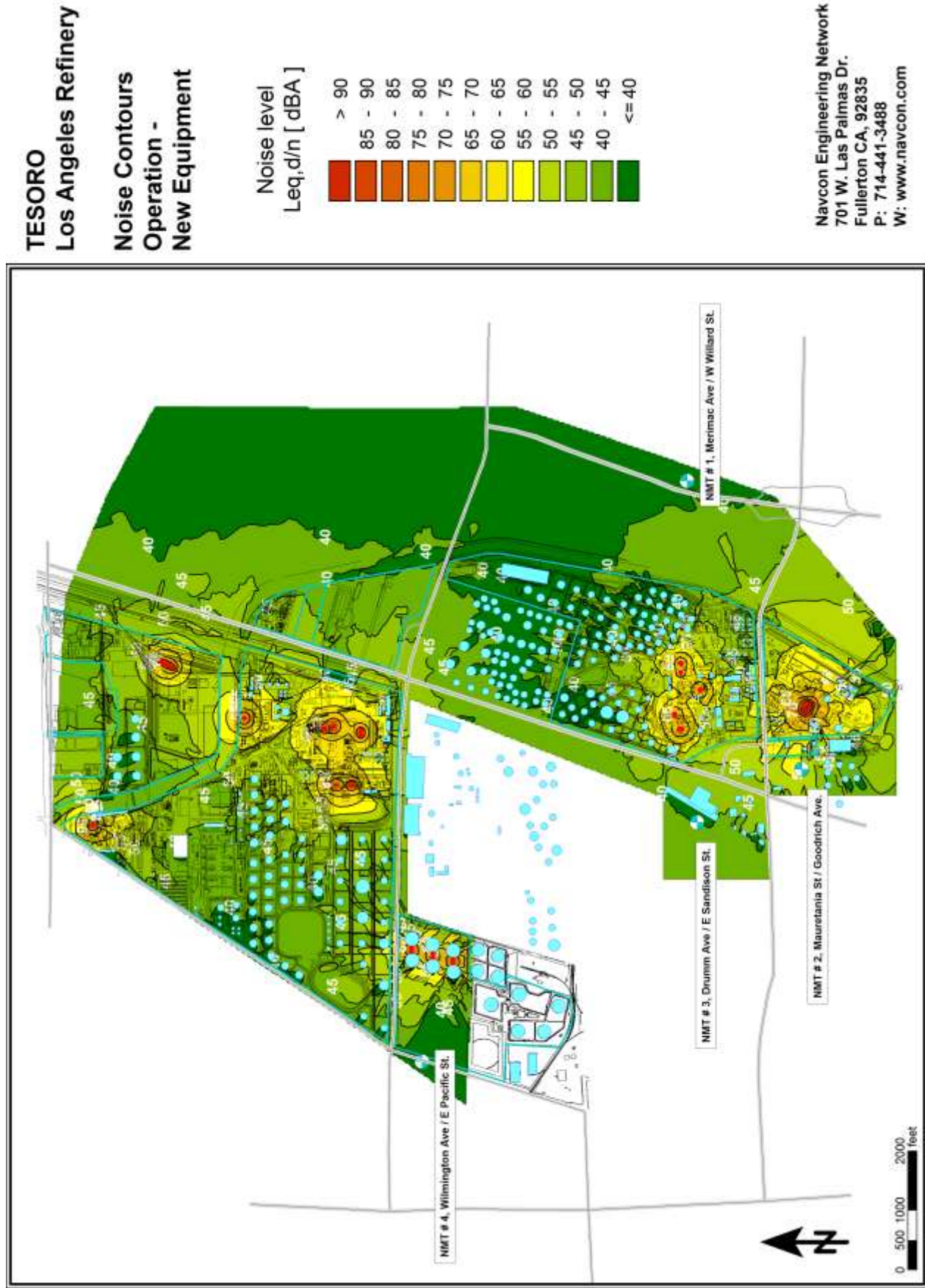


Table 4-2, Project Sensitive Receptor Locations

NMT	Address	City, State
#1	Merrimac Ave. / W Willard St.	Long Beach, CA
#2	Mauretania St. / Goodrich Ave.	Los Angeles, CA
#3	Drumm Ave. / E Sandison St.	Los Angeles, CA
#4	Wilmington Ave. / E Pacific St.	Carson, CA

Table 4-3, NOI-1 Construction Noise CNEL (Baseline vs. Baseline & Construction)

Receptor Location	Baseline 2014			Construction			Baseline & Construction			Overall Change		
	CNEL	Leq,d	Leq,n	CNEL	Leq,d	Leq,n	CNEL	Leq,d	Leq,n	CNEL	Leq,d	Leq,n
NMT #1, Merrimac Ave. / W Willard St.	72.8	69.2	64.9	59.0	57.7	50.2	73.0	69.5	65.1	0.2	0.3	0.1
NMT #2, Mauretania St. / Goodrich Ave.	76.4	70.1	69.8	64.4	63.7	54.9	76.7	71.0	69.9	0.3	0.9	0.1
NMT #3, Drumm Ave. / E Sandison St.	72.7	68.4	65.4	58.6	57.2	50.0	72.9	68.7	65.6	0.2	0.3	0.1
NMT #4, Wilmington Ave. / E Pacific St.	68.2	65.0	60.3	59.0	58.2	49.6	68.7	65.8	60.6	0.5	0.8	0.4

Note: The noise level predictions indicate that the construction activities will have a negligible impact at the residential locations. The largest increase in the Community Noise Exposure Level (CNEL) is predicted to be 0.3 dBA. The largest daytime increase (Leq,day) is predicted at 0.9 dBA while the largest nighttime increase (Leq,night) is predicted at 0.4 dBA. The predicted change in noise level is less than the threshold of significance, 3 dB (refer to **Section 4.1**).

Table 4-4, NOI-2 & NOI-3 New Equipment CNEL, Leq,d/n (Baseline vs. Baseline with Equip.)

Receptor Location	2014 Measured Baseline Levels			Predicted New Equipment Levels			2014 Baseline + New Equipment			Predicted Change (+ increase)		
	CNEL	Leq,d	Leq,n	CNEL	Leq,d	Leq,n	CNEL	Leq,d	Leq,n	CNEL	Leq,d	Leq,n
NMT #1, Merrimac Ave. / W Willard St.	72.8	69.2	64.9	45.5	38.8	38.8	72.8	69.2	64.9	0.0	0.0	0.0
NMT #2, Mauretania St. / Goodrich Ave.	76.4	70.1	69.8	58.9	52.2	52.2	76.5	70.2	69.9	+ 0.1	+ 0.1	+ 0.1
NMT #3, Drumm Ave. / E Sandison St.	72.7	68.4	65.4	45.2	38.6	38.6	72.7	68.4	65.4	0.0	0.0	0.0
NMT #4, Wilmington Ave. / E Pacific St.	68.2	65.0	60.3	42.4	35.8	35.8	68.2	65.0	60.3	0.0	0.0	0.0

Note: The noise level predictions indicate that the Plant operation will have a negligible impact at the residential locations. The largest increases in the Community Noise Exposure Level (CNEL), the daytime level (Leq,day) and the nighttime level (Leq,night) is predicted to be 0.1 dBA. The predicted change in noise level is less than the threshold of significance, 3 dB (refer to **Section 4.1**).

5.0 APPENDIX A, THREE DIMENSIONAL NOISE MODEL INPUT DATA

Table 5-1, Noise Model Operational Data Proposed Project

No.	Plant	Equipment	Number of New Equipment	Lw, dBA
1	No. 51 Vacuum Unit Modifications (C)	Heat Exchanger	5	n/a
		Pumps (Electric)	3	102
		Coalescers	2	n/a
2	HCU (C)	Heat Exchanger	3	n/a
		Pumps (Electric)	2	106
		Knockout drum	1	n/a
3	Interconnecting Pipelines	Pumps (Electric)	2	n/a
4	HCU Modification (W)	Steam Generators	1	n/a
		Air Cooler	1	103
		Pumps (Electric)	2	100
5	Liquid Petroleum Gas (LPG) Rail Unloading (C)	Pumps (Electric)	4	102
		Ten additional rail cars		n/a
6	HTU-4 (W)	Pumps (Electric)	4	101
		Heat Exchanger	11	n/a
		Surge drum	1	n/a
		Salt dryer	1	n/a
		Coalescer	1	n/a

Table 5-2, Noise Model Operational Data Proposed Project (Cont'd)

No.	Plant	Equipment	Number of New Equipment	Lw, dBA
7	Naphtha HDS Unit Modification (C)	tower	1	n/a
		caustic scrubber	1	n/a
		K/O drums	2	n/a
		coalescer	1	n/a
		accumulator	1	n/a
		condensate pot	1	n/a
		heat exchnagers	14	n/a
		air cooler	1	108
		pumps (electric)	6	101
8	Naphtha Isomerization Unit Modifications (C)	Gas Treater	1	n/a
		Tower	1	n/a
		Flash drum	2	n/a
		Heat Exchanger	2	n/a
		Pumps (Electric)	4	101
9	Alkylation Modification (C)	Heat Exchanger	6	n/a
		Filter /Coalescer	1	n/a
		Truck loading rack	1	n/a
		Pumps (Electric)	2	101
10	Mid Barrel Distillate Treater	Piping		n/a

Table 5-3, Noise Model Operational Data Proposed Project (Cont'd)

No.	Plant	Equipment	Number of New Equipment	Lw, dBA
10	LHU Modifications (C)	Heat Exchanger	5	n/a
		Steam Nozzle	1	n/a
		Coalescer	1	n/a
		Salt Dryer		n/a
		Condensate pot	1	n/a
13	New Wet Jet Treater (C)	Pumps (Electric)	6	101
		Reactors	2	n/a
		Product Separators	2	n/a
		loading facility	1	n/a
14	New Crude Tankage (C)	Pumps (Electric)	5	105
15	PTSU (W)	Pumps (Electric)	4	101
		Absorbers		n/a
		Dryers		n/a
15	CRU-3 (W)	Heat Exchanger	3	n/a
		Pumps (Electric)	4	101
		Depropanizer tower	1	n/a
16	HTU-1 (W)	Heat Exchanger	5	n/a
		Pumps (Electric)	1	101
		Feed Surge Drum		n/a
16	HTU-2 (W)	Pumps (Electric)	2	101

Table 5-4, Noise Model Operational Data Proposed Project (Cont'd)

No.	Plant	Equipment	Number of New Equipment	Lw, dBA
17	Sulfuric Acid Regeneration Plant (W)	Pumps (Electric)	8	102
		Gas Fired Furnace	1	106
		Air Heater	1	n/a
		Steam Generator	1	107
		Blower	4	n/a
		Heat Exchanger	8	n/a
		Compressor	1	108
18, 19	SCAQMD Rule 1114 –Coker Venting(C)	Venturi	1	109
21	Wilmington Replacement Crude Tanks (W)	None		n/a

Table 5-5, Noise Model Input Data Construction Noise Emission Levels

Name	Shift (1/2)	Octave Band Sound Power Level [dBA]								Sound Power Lw
		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	
No. 01 No 51 Vacuum Unit Mod Construction	2	92	108	118	118	120	118	112	104	125
No. 02 HCU Construction (C)	2	92	107	117	118	119	117	111	103	124
No. 03-11 Horiz. Drilling Equipment New Pipeline	1	82	97	107	108	109	107	101	93	114
No. 3 Interconnecting Pipe Construction	1	97	112	123	123	124	123	116	108	130
No. 04 HCU Modification Construction (W)	2	91	106	117	117	118	116	110	102	123
No. 05 Rail Car Unloading Construction	2	90	105	116	116	117	116	109	101	123
No. 06 HTU-4 Construction	2	92	107	118	118	119	118	111	103	125
No. 07 Alky Construction	2	92	107	118	118	119	118	111	103	125
No. 08 Naphtha Isomerization Construction	2	89	104	115	115	117	115	108	100	122
No. 09 Alkylation Construction	2	90	105	116	116	117	116	109	101	123
No. 10 LHU Modifications Construction	2	92	107	118	118	119	118	111	103	125
No. 13 New Wet Jet Treater Construction	1	92	107	118	118	119	118	111	103	125
No. 14 New Crude Tank Construction	1	95	110	121	121	122	120	114	106	127
No. 15 PSTU Construction	1	93	108	119	119	120	119	112	104	126
No. 16 HTU-1 Construction	1	93	108	118	119	120	118	112	104	125
No. 17 Sulfuric Acid Regeneration Plant	1	95	110	120	121	122	120	114	106	127
No. 18, 19 Coker Unit Construction	1	91	106	116	117	118	116	110	102	123
No. 20 Drilling Equipment New Electrical	1	93	109	119	119	121	119	113	105	126
No. 20 Electrical Line Construction	1	93	109	119	119	121	119	113	105	126
No. 21 Crude Tanks Equipment Construction	1	97	112	122	123	124	122	116	108	129
No. 22 Naphtha Isom Equipment	1	89	104	115	115	116	114	108	100	121