

LEHIGH CEMENT PLANT
NOISE MONITORING REPORT



**CITY OF CUPERTINO
PUBLIC WORKS DEPARTMENT**

November 14, 2016

Lehigh Cement Plant Noise Monitoring Report

November 14, 2016

Prepared for:

Alex Wykoff

Environmental Programs Division Specialist
City of Cupertino Public Works Department

Prepared by:

Randy Waldeck, PE

Greg Baker

CSDA Design Group

475 Sansome Street, Suite 800

San Francisco, CA 94111

CSDA Project No. 1626.01

Table of Contents

<u>Section</u>	<u>Page</u>
1.0 Executive Summary.....	3
2.0 Project Description.....	3
3.0 Acoustical Criteria and Measurement Locations	3
4.0 Observations	5
4.1 Weather	5
4.2 General Noise Conditions	5
5.0 Data Analysis Methodology	5
6.0 Results.....	5
6.1 10160 Firwood Drive.....	5
6.1.1 Notes	5
6.1.2 Observations.....	6
6.1.3 Measured Levels.....	6
6.1.4 Links to Audio Recordings	6
6.2 23022 Voss Avenue.....	7
6.2.1 Notes	7
6.2.2 Observations.....	7
6.2.3 Measured Levels.....	7
6.2.4 Links to Audio Recordings	7
6.3 Time History Graphs.....	9
6.3.1 October 15.....	9
6.3.2 October 27.....	10

1.0 Executive Summary

- Unattended, continuous noise measurements were conducted at two locations to quantify and characterize noise from Lehigh Cement Plant operations due to neighborhood complaints. The measurements started around 7:00 PM on October 3, 2016, and concluded around 10:00 AM on October 28, 2016.
- The noise environment during the nighttime hours (10 PM to 7 AM) at each of the two measurement locations was characterized by crickets, periodic aircraft flyovers, traffic on nearby roads, suburban noises (e.g., music from inside the houses, people talking), and cement plant noise.
- Cement plant noise exceeded the noise standards during the nights beginning on October 15 and 27 at both measurement locations.

2.0 Project Description

The Lehigh Cement Plant is located at Permanente Quarry, a limestone quarry in an unincorporated area of Santa Clara County (the County), California. The quarry is a limestone and aggregate mining operation, with a cement plant (the Plant) located just west of Cupertino owned by Lehigh Southwest Cement. The Plant recently undertook noise studies to verify noise reduction modifications of an induced draft fan in June 2015; however, the Plant has received continued complaints due to noises described by nearby residents as “continuous machinery, start-ups and stoppages of conveyer belts, kiln, rock crushers, and many other heavy machinery.”

CSDA Design Group was retained to conduct and analyze one month of noise measurements (with audio recordings) to determine if the Plant is in violation of the Santa Clara County noise standards. This report details the continuous noise measurements conducted during October of 2016.

3.0 Acoustical Criteria and Measurement Locations

The Santa Clara County Code of Ordinances¹ stipulates that single-family residential land shall not be subject to noise levels above 55 dBA during the day and 45 dBA during the night. It further stipulates a penalty of five decibels for noise that “contains a steady, audible tone such as a whine, screech or hum or contains music or speech.” Table 3-1 contains the applicable criteria for the survey.

Table 3-1: Santa Clara County Code of Ordinances Noise Standards for Noise with Steady, Audible Tones

Receiving Land Use Category	Time Period	Maximum Noise Level (dBA)
One- and Two-family Residential	10 PM to 7 AM	40
	7 AM to 10 PM	50

Figure 3-1 depicts the two designated sound monitoring sites and the location of the cement plant. Figure 3-2 shows a typical noise monitor installation.

¹Santa Clara County Code 2016 § B11-152:
https://www.municode.com/library/ca/santa_clara_county/codes/code_of_ordinances?nodeId=TITBRE_DIVB11ENHE_CHVIIIIC_ONOVI_SB11-152EXNOL



Figure 3-1: Noise Monitoring Locations

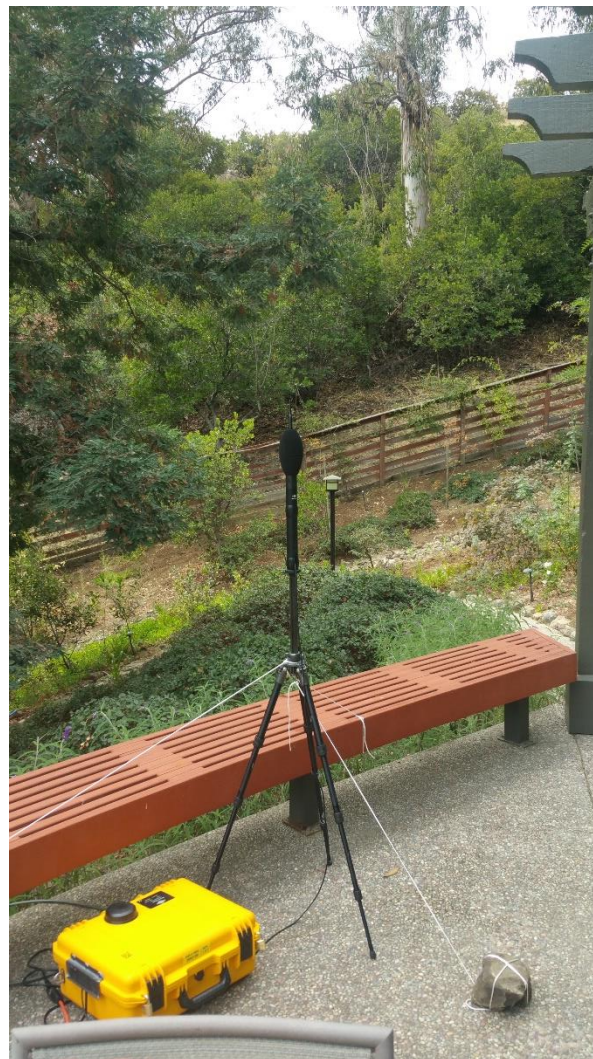


Figure 3-2: Photo of Noise Monitor at Voss Street

4.0 Observations

4.1 Weather

From October 3 to 28, 2016, the maximum wind speed was 24 miles per hour (mph), with an average speed of 5 mph; wind noise did not affect the measurement. The temperature ranged from a low of 49°F to a high of 88°F, while the average was 64°F. The humidity ranged from a low of 16% on October 8 to a high of 100% from October 15 to 16, while averaging 64%. It rained from October 14 to 16 for a total of one inch, and again from October 27 to 28 for another total of one inch.

4.2 General Noise Conditions

Crickets, periodic aircraft flyovers, suburban noises (e.g., music from inside the houses, people talking), and occasional elevated noise from the Plant were the dominant contributors to the ambient nighttime noise environment. Road traffic and background “hum” from the Plant were minor contributors to the overall nighttime noise levels. The specific nature of these noises, as well as those that were above the County’s noise standards, are described in Section 6.0 below.

5.0 Data Analysis Methodology

To determine which activity took place at the time the noise standards were exceeded, we compared the time history graphs² from the field measurements to the noises that dominated when listening to the audio recordings. If noise from the Plant clearly dominated the audio recording during the time that noise levels exceeded the standard, we attributed the noise level exceedance to the Plant. The tables presented in Section 6.0 show the results of the analysis.

6.0 Results

Noise from the Plant was above the noise standard during two nights that measurements took place. Ambient noise levels at the Voss Avenue location were generally higher, with the exception of those two nights. We have summarized the results at each measurement location in the following sections. The noise levels in the tables show both the range of measured noise levels (stripping out any short-term, atypical noisy events such as loud motorcycles or sirens),³ as well as an average level (L_{eq}) for the same time period. In Section 6.3, we have presented time history graphs showing the noise level during times when cement plant noise was dominant.

6.1 10160 Firwood Drive

6.1.1 Notes

The measurement was taken on a tripod six feet above the ground, and more than 10 feet from any reflecting vertical surface.

The measurement commenced at 12:00 PM on October 3, 2016, and ended at 10:00 AM on October 28, 2016.

² Time history graph: A graph showing the fluctuating noise level over time.

³ The range of noise levels presented in the table show the range between the L_{95} (all noise levels except the quietest 5%) and the L_{10} (all noise levels except the loudest 10%). This effectively strips out atypical quiet noise levels such as periodic lulls in Hwy 280/SR 85 traffic noise and noisy events such as sirens or loud motorcycles.

The equipment was calibrated immediately before and after the measurement with no significant drift in response.

6.1.2 Observations

Typical noises included crickets, road traffic, and aircraft flyovers. There were two exceedances of the noise standards due to operational noise from the Plant during the nights beginning October 15 and 27.

6.1.3 Measured Levels

Table 6-1: 10160 Firwood Drive – Nighttime Measured Levels (10 PM to 7 AM)

Start Date	Range (dBA)	L _{eq} (dBA)	Dominant Noise	Start Date	Range (dBA)	L _{eq} (dBA)	Dominant Noise
October 3	35 to 46	41	Crickets	October 16	33 to 48	42	Rain
October 4	30 to 45	40	Crickets	October 17	31 to 45	40	Crickets
October 5	35 to 45	42	Crickets	October 18	35 to 44	41	Crickets
October 6	35 to 44	41	Crickets	October 19	33 to 45	43	Crickets
October 7	35 to 47	43	Crickets	October 20	35 to 44	42	Crickets
October 8	33 to 46	42	Crickets	October 21	32 to 44	38	Crickets
October 9	31 to 45	41	Crickets	October 22	29 to 44	37	Crickets
October 10	28 to 42	37	Crickets	October 23	38 to 49	44	Crickets
October 11	27 to 42	36	Crickets	October 24	34 to 47	42	Crickets
October 12	30 to 43	39	Crickets	October 25	33 to 44	40	Crickets
October 13	37 to 44	42	Crickets	October 26	31 to 41	40	Crickets
October 14	30 to 41	37	Crickets	October 27	39 to 50	47	Cement Plant
October 15	36 to 50	46	Cement Plant				

Note: Values in **bold** indicate a noise exceedance from the Plant.

6.1.4 Links to Audio Recordings

For the exceedance on the night beginning October 15, the audio recording from 12:20 AM to 12:30 AM best exemplifies the noise from the Plant that caused the exceedance:

<https://nsusnorthbk.blob.core.windows.net/a82-soundrequest-2016/soundrequest-20161016t072000z-94e12df4-9be3-49fc-af3a-9a24f77cfb93.mp3?sv=2014-02-14&sr=b&si=read&sig=MnaQSIJzhifooLjGm4BQwwbKX91abjylyGwKX0Eemc%3D&se=2019-11-07T22%3A39%3A34Z>

The audio recording from 5:30 AM to 5:40 AM demonstrates the ambient level after the exceedance ended:

<https://nsusnorthbk.blob.core.windows.net/a82-soundrequest-2016/soundrequest-20161016t123000z-72c91b02-41f5-41ad-8a41-403dfa916c68.mp3?sv=2014-02-14&sr=b&si=read&sig=k4Yr46PvOYidCS%2F0pDIQUhw9w9KdzuFymFSQB1Qqu4%3D&se=2019-11-07T22%3A39%3A34Z>

For the exceedance on the night beginning October 27, the audio recording from 1:30 AM to 1:40 AM best exemplifies the noise from the Plant that caused the exceedance:

<https://nsusnorthbk.blob.core.windows.net/a82-soundrequest-2016/soundrequest-20161028t083000z-be1bcac0-0dc6-4c96-80b8-ee943cf256ff.mp3?sv=2014-02-14&sr=b&si=read&sig=GBD8Vlw83Czeh3TFPgAN4VBBW8JI6uPtj7pCaW79St4%3D&se=2019-11-11T01%3A23%3A37Z>

The audio recording from 1:30 AM to 1:40 AM during the previous night, beginning October 26, demonstrates the typical ambient noise during that time:

<https://nsusnorthbk.blob.core.windows.net/a82-soundrequest-2016/soundrequest-20161027t083000z-b6eef686-3afd-4aa6-bd96-a63adbd59b21.mp3?sv=2014-02-14&sr=b&si=read&sig=V147dTbrHQv2LdciXpnOZm1EN13cog8LJEyAmqfuy4%3D&se=2019-11-09T00%3A17%3A28Z>

6.2 23022 Voss Avenue

6.2.1 Notes

The measurement was taken on a tripod 6 feet above the ground and more than 10 feet from any reflecting vertical surface.

The measurement commenced at 2:00 PM on October 3, 2016, and ended at 10:00 AM on October 28, 2016.

The equipment was calibrated immediately before and after the measurement with no significant drift in response.

6.2.2 Observations

Typical noises included crickets, road traffic, and periodic aircraft flyovers. There were two exceedances of the noise standards due to operational noise from the Plant during the nights beginning October 15 and 27.

6.2.3 Measured Levels

Table 6-3: Voss Avenue – Nighttime Measured Levels (10 PM to 7 AM)

Start Date	Range (dBA)	L _{eq} (dBA)	Dominant Noise	Start Date	Range (dBA)	L _{eq} (dBA)	Dominant Noise
October 3	32 to 47	45	Crickets	October 16	32 to 49	42	Rain
October 4	31 to 51	43	Crickets	October 17	28 to 47	39	Crickets
October 5	31 to 50	45	Crickets	October 18	33 to 47	43	Crickets
October 6	35 to 52	47	Crickets	October 19	34 to 47	43	Crickets
October 7	33 to 51	47	Crickets	October 20	36 to 50	45	Crickets
October 8	33 to 53	48	Crickets	October 21	30 to 45	40	Crickets
October 9	36 to 51	45	Crickets	October 22	29 to 40	36	Crickets
October 10	30 to 49	44	Crickets	October 23	36 to 48	44	Crickets
October 11	29 to 50	44	Crickets	October 24	34 to 47	41	Crickets
October 12	29 to 46	40	Crickets	October 25	33 to 45	41	Crickets
October 13	36 to 49	45	Crickets	October 26	34 to 42	39	Crickets
October 14	30 to 47	42	Crickets	October 27	33 to 46	43	Cement Plant
October 15	31 to 45	42	Cement Plant				

Note: Values in **bold** indicate a noise exceedance from the Plant.

6.2.4 Links to Audio Recordings

For the exceedance on the night beginning October 15, the audio recording from 12:20 AM to 12:30 AM best exemplifies the noise from the Plant that caused the exceedance:

<https://nsusnorthbk.blob.core.windows.net/a82-soundrequest-2016/soundrequest-20161016t072000z-28be39a6-1885-4ab9-a4e3-42620070ed1d.mp3?sv=2014-02-14&sr=b&si=read&sig=HxNXRErcl3VYcs2R%2Bft%2BUcylsqWhLqKS2sVr8%2FyMrBk%3D&se=2019-11-07T22%3A39%3A34Z>

The audio recording from 5:30 AM to 5:40 AM demonstrates the ambient level after the exceedance ended:

<https://nsusnorthbk.blob.core.windows.net/a82-soundrequest-2016/soundrequest-20161016t123000z-f08063d7-4776-4f92-9588-b4adf3de9ff0.mp3?sv=2014-02-14&sr=b&si=read&sig=7H99DOpcYmyVyoGVQc5eHFhTGbhkNO90QLoSpx6%2Bjj4%3D&se=2019-11-07T22%3A39%3A34Z>

For the exceedance on the night beginning October 27, the audio recording from 1:30 AM to 1:40 AM best exemplifies the noise from the Plant that caused the exceedance:

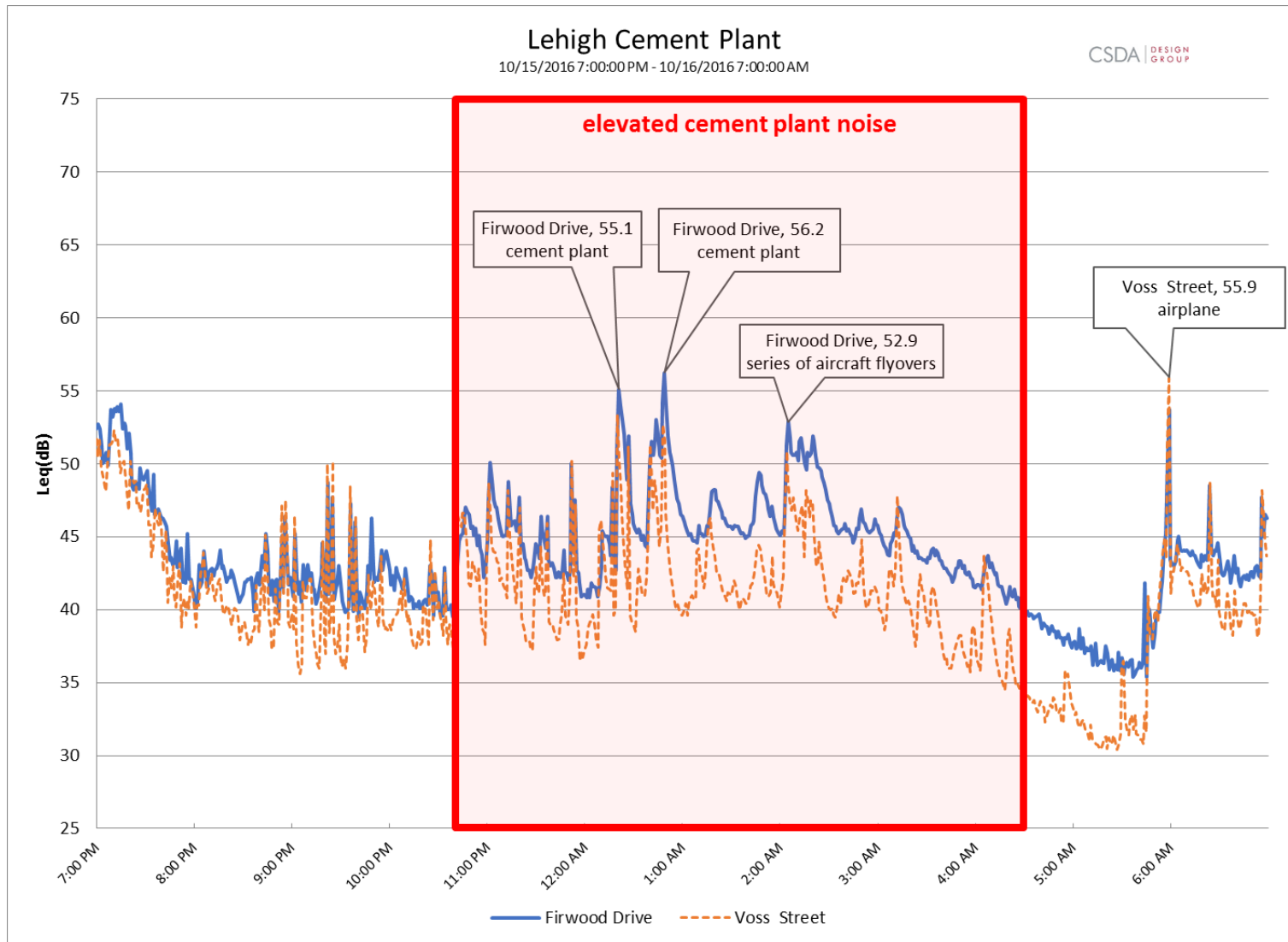
<https://nsusnorthbk.blob.core.windows.net/a82-soundrequest-2016/soundrequest-20161028t083000z-e5edda23-b475-45b9-8c85-fd93cd88d3b5.mp3?sv=2014-02-14&sr=b&si=read&sig=jLk9A7TAskw4Vd6L8DZD9bQW7rlgnvIW3kPbG90HfXE%3D&se=2019-11-11T01%3A23%3A37Z>

The audio recording from 1:30 AM to 1:40 AM during the previous night, beginning October 26, demonstrates the typical ambient noise during that time:

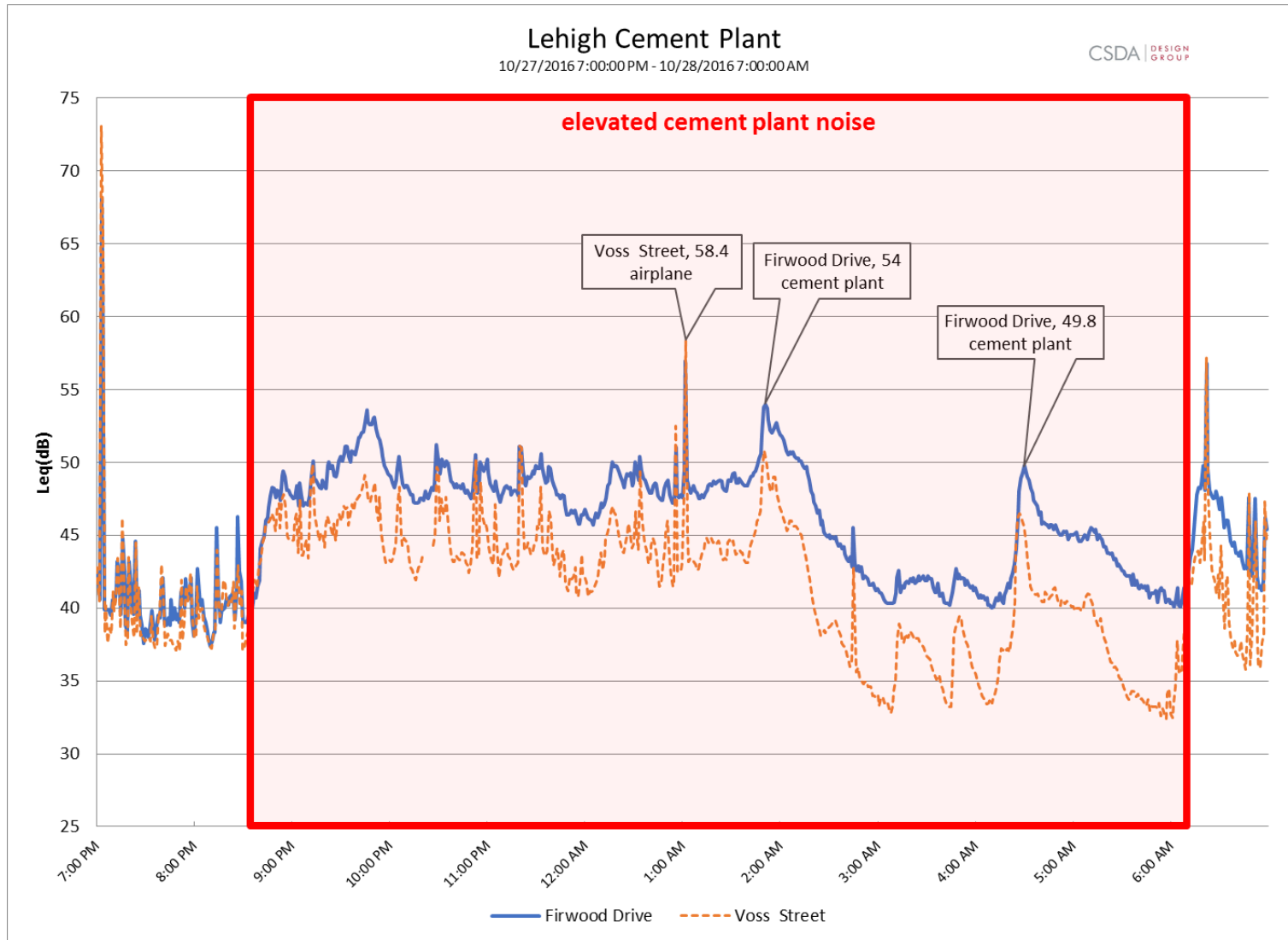
<https://nsusnorthbk.blob.core.windows.net/a82-soundrequest-2016/soundrequest-20161027t083000z-07213976-d91e-48df-b59a-35bec63c90f4.mp3?sv=2014-02-14&sr=b&si=read&sig=xZzrMgf%2FxAzlpLhuPaLVNM8Ayp75FS42kN6IU2OsE%3D&se=2019-11-09T00%3A17%3A28Z>

6.3 Time History Graphs

6.3.1 October 15



6.3.2 October 27



This concludes our noise monitoring report for the Lehigh Cement Plant measurements conducted during October of 2016.