

January 7, 2020

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Attn: Creed Eckert, City Planner

From: DSA Acoustical Engineers, Inc.



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Principal

Re: L&M Industrial Fabrication Post-Mitigation Noise Measurements
Project #: 101201

Introduction

At the request of the City of Tangent, Oregon, DSA Acoustical Engineers, Inc. conducted sound level measurements on several occasions in November and December to determine if the noise radiating from L&M Industrial Fabrication (L&M) complies with the limits specified in the Oregon DEQ noise regulations. This report provides the results of those measurements and the conclusions based on the results.

Summary of Findings

The results of sound measurements made during four (4) different time periods on three (3) different days show the noise radiating from the L&M currently complies with the limits specified in the Oregon DEQ Noise Control Regulations for Industry and Commerce. Based on information provided by L&M, current facility operations include forklift activity between 7 AM and 7 PM on Tax Lot 107 and between 8 AM and 6 PM on Tax Lot 101, interior activities inside the paint and subarc building between 8 AM and 6 PM and interior activities inside the structural and industrial buildings for 24-hours a day. Structural and industrial building doors are closed between 7 PM and 7 AM each night.

DEQ Noise Regulation Limits

The noise radiating from L&M operations is subject to the limits specified in the Oregon DEQ Noise Control Regulations for Industry and Commerce (OAR 340-035-0035). The noise limits are broken down into limits specified for “daytime hours” (7 AM – 10 PM) and “nighttime hours” (10 PM – 7 AM). The limits for industrial noise are presented in terms of



what is called “hourly statistical noise limits”. Specifically, the regulations refer to the hourly L₀₁, L₁₀ and L₅₀ limits which are defined as the level equaled or exceeded 1%, 10% and 50% of the time during 60 consecutive minutes of time, respectively. The specified daytime and nighttime hour limits are shown in Table 1.

TABLE 1: DEQ Noise Regulation Limits

Time Period	Hourly Statistical Noise Limit (dBA)		
	L ₀₁ ¹	L ₁₀ ¹	L ₅₀ ¹
Daytime Hours 7 AM – 10 PM	75	60	55
Nighttime Hours 10 PM – 7 AM	60	55	50

Note 1: The L₀₁, L₁₀ and L₅₀ are the noise levels equaled or exceed 1%, 10% and 50% of the time during a 60 consecutive-minute period.

In addition to the hourly statistical noise limits shown above, the DEQ Noise Control Regulations for Industry and Commerce says no owner of an industrial source shall cause or permit the operation of a source that produces an impulsive sound that exceeds 100 dB (peak response) during daytime hours or 80 dB (peak response) during nighttime hours (OAR 340-035-0035 (1)(d)(B)). An impulsive sound is defined in the regulation as “either a single pressure peak or a single burst (multiple pressure peaks) for a duration of less than one second as measured on a peak unweighted sound pressure measuring instrument” (OAR 340-035-0015 (21)).

Because L&M activities can at time produce impulsive noise, that noise, when generated is subject to both the hourly statistical noise level limits and the impulsive noise limits. Both limits were considered during the sound measurements.

Sound Level Measurements

Sound level measurements were made at various times on three different days between November 20 and December 2, 2020 to determine if the noise radiating from the L&M facility was in compliance with the DEQ noise regulation limits. All measurements were made with a Larson Davis LxT precision sound level meter. The meter is an ANSI compliant Type 1 sound level meter that has the ability to continually monitor the instantaneous sound level and determine and save statistical sound level information about the data as well as determine and store the average sound level and the peak sound pressure every second of the measurement. The meter was programmed to determine the L₀₁, L₁₀ and L₅₀ noise levels for each measurement.

On November 20, measurements were made at two locations in the residential property west of L&M. An approximate 38-minute measurement was made in the back yard of the Nofziger residence (see Figure 1 for location) between 12:37 p.m. and 1:15 p.m. in response to an inquiry to Mr. Nofziger regarding a good time to capture representative noises coming from L&M. Notes were made during the measurement of the sources of noise that could be



DSA Acoustical Engineers, Inc. Phone: 503-516-4298 Email: stanhartk@comcast.net		L&M Noise Compliance Measurement Locations		
DESIGNED BY:	DRAWN BY:	DATE:	PROJECT NO.	Figure 1
kgs	kgs	12/16/2020	101201	

heard and especially when there were impulsive banging noises. The temperature during the measurement was approximately 45°F, the wind was calm and the relative humidity was approximately 67%; all considered good for sound propagation through the atmosphere.

Measurements were also made on November 20 at a point between Home 1 (H1) and Home 2 (H2) in the Harmony Acres mobile home park (see Figure 1 for location). Measurements at that Harmony Acres location were made between 1:17 p.m. and 1:47 p.m. and again between 2:45 p.m. and 3:21 p.m. As during the Nofziger residence measurements, notes were made of the sources of noise resulting in the measured data, including impulsive noise. The temperature during the earlier measurement was approximately the same as those found at the Nofziger residence. However, during the later measurement, the relative humidity had risen to approximately 73% and the wind had begun to blow from 0 to 2 mph from a northeasterly direction.

On November 24, 2020 noise measurements were made in the Harmony Acres mobile home park at a location between Home 2 (H2) and Home 3 (H3) (see Figure 1 for location). An approximate 34-minute measurement was made at the location between 9:30 a.m. and 10:05 a.m. The measurement was made on that date because the weather forecast indicated the wind would be blowing from the southeast (from the L&M buildings toward the measurement location) at a low enough speed that it would be acceptable under the DEQ Noise Measurement Procedure Manual to make a valid measurement. No additional measurements were made beyond the single measurement on that day due to the fact the wind increased to above 10 mph shortly after the measurement was concluded. A wind above 10 mph is above the speed for an acceptable measurement in the DEQ Noise Measurement Procedure Manual. The temperature during the measurement was around 47°F and the relative humidity was around 71%; both in a good range for good outdoor sound propagation.

On December 2, 2020 noise measurements were made again at the Nofziger residence and at the location in the Harmony Acres mobile home park between H1 and H2. Measurements at the Nofziger residence location were made between 3:44 p.m. and 4:15 p.m. and again between 11:00 p.m. and 11:23 p.m. The late afternoon measurements were made, again, at a time suggested by Mr. Nofziger as being a good time when higher noise generating activity would likely be occurring. The late-night measurements were made to help determine if the nighttime operations at L&M were in compliance with the DEQ nighttime hour limits. The weather during both time periods was good for sound measurements with the wind generally calm with a slight breeze from the north. The temperature during the afternoon measurements was close to 44°F and the relative humidity was around 77%. During the late-night measurement, the temperature was around 32°F and the relative humidity was above 80%.

The December 2 measurements at the Harmony Acres location between home H1 and H2 were made between 3:08 p.m. and 3:38 p.m. and again between 4:19 p.m. and 4:29 p.m. Late-night measurements were made at the location between 10:35 p.m. and 10:48 p.m. The weather conditions during the afternoon and late-night measurements were similar to those found at the Nofziger residence. The late-night measurement was cut shorter than that made at the Nofziger residence due to the fact the heat pump at the H1 residence turned on and began to dominate the measured data. It was decided the data captured prior to that time



would be sufficient to determine if the L&M noise complied with the DEQ noise regulation limits.

All locations selected for the L&M noise compliance measurements were approximately 20 to 25 feet from residences as specified in the DEQ Noise Measurement Procedure Manual. The locations were also selected based on their placement relative to activities occurring on the L&M property that might have an influence on the measured sound levels.

Measurement Results

The results of the L&M noise compliance measurements made by DSA Acoustical Engineers Inc. are presented in Table 2. The DEQ noise limits are also shown in the table for comparison purposes.

TABLE 2: L&M Noise Compliance Measurement Results¹

Location	Date	Time	L ₀₁ (dBA)	L ₁₀ (dBA)	L ₅₀ (dBA)	Maximum “Peak” Noise Level (dB) (impulsive noise)
Nofziger	11/20/20	12:37 -1:15 pm	52.0	48.4	45.9	87
	12/02/20	3:44 – 4:15 pm	64.7	53.9	50.8	84
		11:00 – 11:23 pm	50.9	48.5	45.9	No impulsive noises
H1-H2	11/20/20	1:17 – 1:47 pm	55.7	51.0	49.2	93
		2:45 – 3:22 pm	58.3	53.5	51.0	89
	12/02/20	3:09 – 3:39 pm	54.3	51.0	48.4	84
		4:19 – 4:28 pm	56.4	53.8	52.5	85
		10:35 – 10:48 pm	54.2	51.2	47.3	No impulsive noises
H2-H3	11/24/20	9:30 – 10:05 am	54.5	51.6	49.2	84
DEQ Limits	7 AM – 10 PM		75	60	55	100
	10 PM – 7 AM		60	55	50	80

Note 1: Measured daytime noise levels and DEQ limits shown in black. Measured nighttime noise levels and DEQ limits shown in red.

The results in Table 2 show the noise levels at all locations and at all measurement times were in compliance with the applicable DEQ noise regulation limits. While it can be concluded that the measured levels were in compliance with the DEQ limits, it should be noted that all the statistical noise levels presented in the table were actually the result of noise



L&M Industrial Fabrication Post-Mitigation Noise Measurements

coming from highway traffic in the area. On the days when the wind was out of the north or northeast (11/20 and 12/02) the background sound level (basically the L₅₀ noise level) was dominated by noise coming from traffic on Highway 99E. On 11/24 when the wind was out of the southeast, the background sound was dominated by Highway 34 traffic noise.

The peak noise levels shown in the table were found by matching the time written in notes about banging noises and the peak levels taken from graphs of the one-second data stored by the sound level meter. The peak noise level data in Table 2 shows the banging noise during the daytime hours was in compliance with the DEQ daytime hour limits. The peak levels shown for the Harmony Acres measurement locations was a result of banging noise generated by forklifts placing steel beams on other steel beams in Tax Lot 101 near the measurement location. The peak noise levels shown for the Nofziger residence location were the result of noise caused by steel being dropped inside the adjacent building. In both cases, if the noises were generated between 10 p.m. and 7 a.m., the levels would exceed the applicable DEQ limit.

Conclusion

The results of the L&M post-mitigation noise measurements show the noise radiating from currently approved operations at the L&M facility are in compliance with the DEQ noise regulations. The data also shows that, without additional mitigation of impulsive noises generated on Tax Lot 101 and inside the SubArc building, operations during DEQ nighttime hours could exceed the limits.

