2023 QUARTER 4 NOISE MONITORING

Concrush Pty Ltd
21 Racecourse Rd, Teralba

Prepared for CONCRUSH

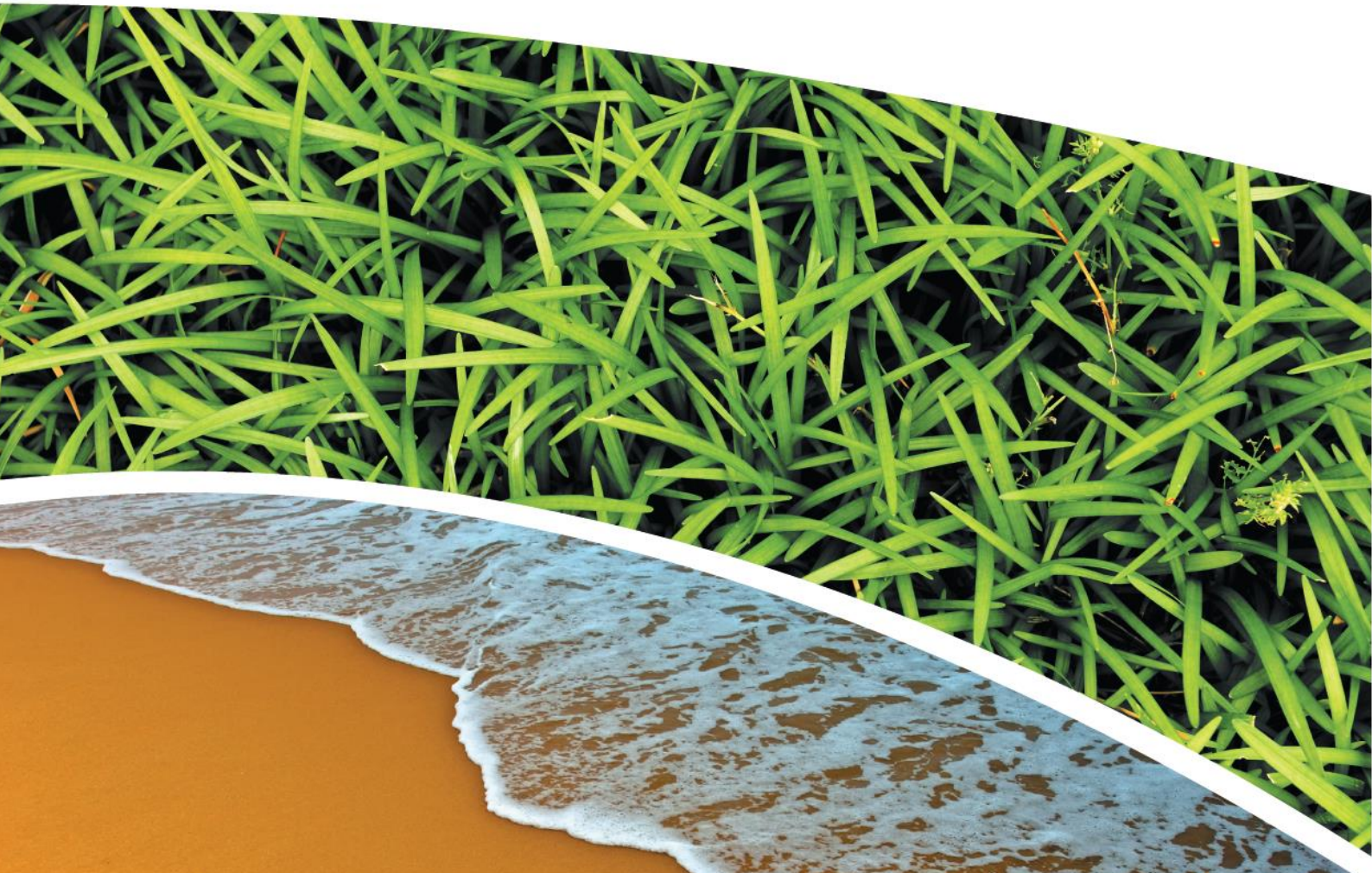
Prepared by RCA Australia

RCA ref 13155-620/0

November 2023

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

DRAFT



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RCA ref 13155-620/0

15 November 2023

Concrush Pty Ltd
21 Racecourse Rd
Teralba NSW 2284

Attention: Mr Kevin Thompson

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Sound & Vibration
Occupational Hygiene

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4TH QUARTER 2023 NOISE MONITORING
CONCRUSH SITE, 21 RACECOURSE RD, TERALBA

1 INTRODUCTION

RCA Australia (RCA) was engaged by Concrush Pty Ltd (Concrush) to carry out a quarterly noise monitoring survey for the Concrush site facility located at 21 Racecourse Road, Teralba, NSW. The purpose of the noise survey was to monitor the noise levels at the closest sensitive receivers and assess site noise against relevant noise criteria.

The survey has been conducted in accordance with the requirements of *AS 1055-2018 - Acoustics - Description and Measurement of Environmental Noise* [1] and the *Noise Policy for Industry* [2] *(NPfI), (EPA 2017).*

Consent Condition B47 makes reference to observing noise limits stated in *EPL13351*. *EPL13351* however does not contain any noise limits, and so environmental noise management levels has been based on the *Operational Noise Management Plan* [3] *(ONMP*) for the Project prepared by RCA.

2 SITE & SURROUNDS

2.1 LOCATION AND SENSITIVE RECEIVERS

Attended noise monitoring will be undertaken on a quarterly basis at the three monitoring locations indicatively shown below. Monitoring locations may change depending on safety and access considerations and to minimise disturbance to residential receivers.

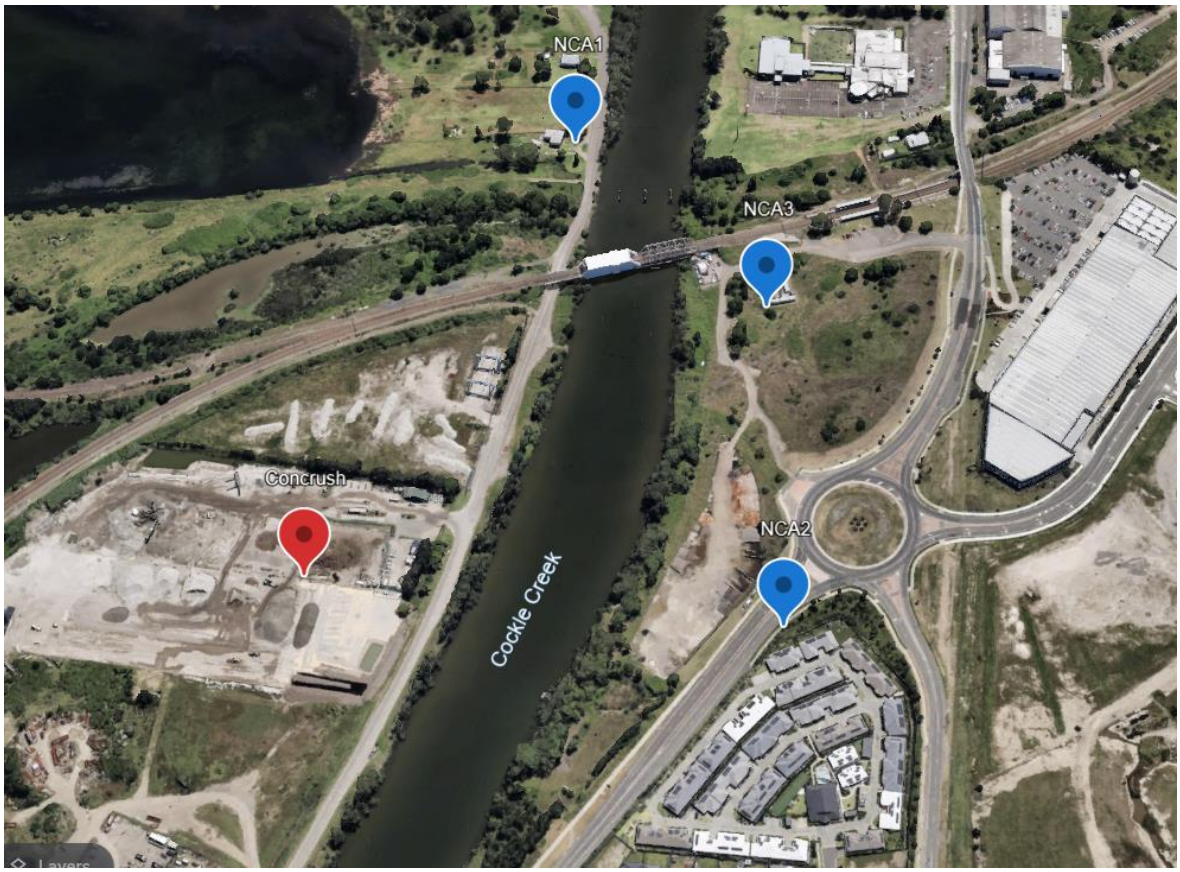


Figure 1 *Site (red) and noise monitoring locations (blue)*

3 CRITERIA

The site's environmental noise management levels at the nominated monitoring locations are shown in **Table 1.**

Table 1 *Quarterly noise monitoring locations and noise management levels*

NCA	Day noise management level $L_{Aeq,15\ min}$ dBA	Eve noise management level $L_{Aeq,15\ min}$ dBA
NCA 1	51	43
NCA 2	56	47
NCA 3	53	53

3.1 ANNOYING CHARACTERISTICS

Under the *NPfI* corrections to measured site levels may apply if annoying characteristics apply to the noise. Possible characteristics are identified in **Table 2**.

Table 2 *Modifying factors as defined in NPfI*

Factor	Description	Correction
Tonal noise	Level of one-third octave band L_{Zeq} exceeds the level of the adjacent bands on both sides by: • 5 dB or more if the centre frequency of the band containing the tone is in the range 500-10,000 Hz • 8 dB or more if the centre frequency of the band containing the tone is in the range 160-400 Hz • 15 dB or more if the centre frequency of the band containing the tone is in the range 25-125 Hz.	5 dB
Low frequency noise	Difference between L_{Ceq} and L_{Aeq} is 15 dB or more and low frequency one-third octave band L_{Zeq} levels exceed the thresholds in Table C2 of the NPfI.	2-5 dB
Intermittent noise	Observed level of the source varies by more than 5 dB during the night.	5 dB
Duration	One noise event in a 24-hr period, which lasts less than 2.5 hours.	0-20 dB increase in criteria

3.2 WEATHER CONDITIONS

The *NPfI* states that environmental noise measurements should not be conducted under the following conditions:

> *Average wind speeds (over 15-minute periods or shorter) at microphone height are greater than 5 metres per second, or when rainfall occurs.*

4 SURVEY METHODOLOGY

4.1 MODIFICATIONS OF PROCEDURES

The quarterly noise monitoring methodology defined in the O*NMP* requires two fifteen minute attended noise measurements to be taken at each monitoring location during both the day and evening.

4.2 MONITORING LOCATIONS

Measurements were undertaken at locations shown in . The NCA 2 location was moved to better represent the nearest residential houses east of the site. Monitoring was conducted near the roundabout.

4.3 EQUIPMENT

The equipment used for attended monitoring sound levels is shown below in **Table 3** and the on-site sound level monitor is shown in

Table 4. The sound level meters are class 1 measurement instruments.

Table 3 *Equipment Used for Attended Sound Pressure Level Measurements*

Type	Make/Model	Serial Number	Last Calibrated

Sound Level Meter	SVAN 979	92044	Feb 2023
Sound Level Meter	SVAN 971	61419	April 2023
Sound Level Meter	SVAN 971	51883	August 2023
Calibrator	SV33B	86489	Feb 2023

Table 4 *On-site sound level monitor*

Type	Make/Model	Serial Number
Sound Level Meter	SV 307	94124

4.4 WEATHER

Conditions were clear and suitable for monitoring in accordance with *AS1055* and the *NPfI*.

Weather conditions observed by the RCA operator at the time of the survey are shown in **Table 5**.

Table 5 *Survey weather conditions ground observation*

Survey Date	Time	Wind Speed (m/s)	Wind Direction	Cloud cover (observed)
30/10/2023	21:00 – 22:00	Calm	-	1/8
31/10/2023	09:15	1-2	NWN	1/8
31/10/2023	09:30	1-2	N	1/8
31/10/2023	10:30	1-2	N	1/8
31/10/2023	11:00	1-2	N	1/8
31/10/2023	11:30	3-4	WNW	1/8
31/10/2023	12:00	4-5	WNW	1/8

5 SURVEY RESULTS

Table 6 and **Table 7** provide the results of the evening and daytime attended noise surveys respectively. Marked time traces of the attended noise surveys are shown in **Appendix A** at the end of this report.

Table 8 presents a comparison of noise levels measured by RCA offsite and the corresponding onsite noise levels measured by Concrush's onsite monitor.

Table 6 *Noise survey observations Evening 30/10/2023*

Survey Location	Survey Date Start Time	Overall				Site L_{Amax} 15 min	Site L_{Aeq} 15min Limit	Site $L_{Aeq\ 15min}$ Contribution	Penalty for annoying characteristics[1]	Site $L_{Aeq\ 15min}$ Contribution including penalty	Complies with condition Y/N?	Noise Sources and Level Range dB(A)
		L_{Amax} 15min	L_{Aeq} 15 min	L_{A10} 15min	L_{A90} 15min							
NCA 2	30/10/2023 20:45	80	68	73	54	Nil	47	Nil	Nil	Nil	Y	Site was waiting for delivery. No site noise. Other: Road traffic and cicadas dominant noise sources.
NCA 2	30/10/2023 21:00	84	68	72	53	Nil	47	Nil	Nil	Nil	Y	
NCA 3	30/10/2023 21:30	73	52	50	45	~50	53	< 30	Nil	< 30	Y	Truck arriving on site briefly audible ~50 dBA. Other: Train 52 – 73 dBA Road traffic 48 – 52 dBA
NCA 3	30/10/2023 21:45	83	66	51	43	~50	53	~ 30	Nil	~ 30	Y	Truck arriving on site briefly audible ~50 dBA. Loader ~ 50 dBA briefly Other: Train 52 – 83 dBA Road traffic 48 – 52 dBA
NCA 3	30/10/2023 22:01	73	53	51	45	53	53	< 35	Nil	< 35	Y	Trucks arriving on site briefly audible ~53 and 50 dBA. Other: Road traffic 48 – 52 dBA

Survey Location	Survey Date Start Time	Overall				Site L_{Amax} 15 min	Site L_{Aeq} 15min Limit	Site $L_{Aeq\ 15min}$ Contribution	Penalty for annoying characteristics[1]	Site $L_{Aeq\ 15min}$ Contribution including penalty	Complies with condition Y/N?	Noise Sources and Level Range dB(A)
		L_{Amax} 15min	L_{Aeq} 15 min	L_{A10} 15min	L_{A90} 15min							
NCA 1	30/10/2023 21:15	80	89	54	41	Nil	43	Nil	Nil	< 30	Y	Site waiting for deliveries. No site noise. Other: Road noise, train and birds dominant noise sources.
NCA 1	30/10/2023 21:30	84	58	50	40	44	43	< 30	Nil	< 30	Y	Truck arrived on site but was inaudible. Visual inspection shows instantaneous noise could be no higher than 44 dBA briefly. Other: Road noise dominant.
NCA 1	30/10/2023 21:45	78	59	55	41	50	43	< 30	Nil	< 30	Y	Truck arrived on site but was inaudible. Tailgate slam audible ~46 dBA. Loader reversing briefly ~40 – 45 dBA. Other: Road noise dominant.
NCA 1	30/10/2023 22:00	80	60	58	42	47	43	< 30	Nil	< 30	Y	2 x truck arrivals briefly barely audible

Table 7 *Noise survey observations Daytime 31/10/2023*

Survey Location	Survey Date Start Time	Overall				Site L_{Amax} 15 min	Site L_{Aeq} 15min Limit	Site $L_{Aeq\ 15min}$ Contribution	Penalty for annoying characteristics[1]	Site $L_{Aeq\ 15min}$ Contribution including penalty	Complies with condition Y/N?	Noise Sources and Level Range dB(A)
		L_{Amax} 15min	L_{Aeq} 15 min	L_{A10} 15min	L_{A90} 15min							
NCA1	31/10/23 09:30	81	64	69	44	45	51	< 40	Nil	Nil	Y	Occasional impact noise ~45 dBA Site crushing <40 dBA (masked by other noise sources) Other: Road Noise 65-81 dBA Birds/Insects 47-50 dBA
NCA2	31/10/23 10:30	85	71	75	64	Nil	56	Nil	Nil	Nil	Y	Site was inaudible (masked by road noise). Other: Road traffic 58-85 dBA
NCA3	31/10/23 09:15	82	65	71	49	51	53	50	Nil	50	Y	Site crushing noise (48 – 51 dB) was mostly masked by other noise sources. Other: Train 56-82 dBA Distant Traffic 52-58 dBA

Survey Location	Survey Date Start Time	Overall				Site L_{Amax} 15 min	Site L_{Aeq} 15min Limit	Site $L_{Aeq\ 15min}$ Contribution	Penalty for annoying characteristics[1]	Site $L_{Aeq\ 15min}$ Contribution including penalty	Complies with condition Y/N?	Noise Sources and Level Range dB(A)
		L_{Amax} 15min	L_{Aeq} 15 min	L_{A10} 15min	L_{A90} 15min							
NCA1	31/10/23 12:00	94	66	69	52	~45	51	< 40	Nil	< 40	Y	Site crushing noise < 40 dB was mostly masked by other noise sources. Other: Road Noise 64-94 dBA Generator ~53 dBA
NCA2	31/10/23 11:30	90	73	76	65	Nil	56	Nil	Nil	Nil	Y	Site was inaudible (masked by road noise). Other: Road traffic 59-90 dBA
NCA3	31/10/23 09:30	74	56	54	48	56	53	50	Nil	50	Y	Site crushing noise (48 – 52 dB) was mostly masked by other noise sources. Occasional impact noise 56 dBA. Other: Train 58-68 dBA Distant Traffic 50 - 59 dBA

Survey Location	Survey Date Start Time	Overall				Site L_{Amax} 15 min	Site L_{Aeq} 15min Limit	Site $L_{Aeq\ 15min}$ Contribution	Penalty for annoying characteristics[1]	Site $L_{Aeq\ 15min}$ Contribution including penalty	Complies with condition Y/N?	Noise Sources and Level Range dB(A)
		L_{Amax} 15min	L_{Aeq} 15 min	L_{A10} 15min	L_{A90} 15min							
NCA3	31/10/23 11:00	79	57	55	48	56	53	50	Nil	50	Y	Site crushing noise (48 – 52 dB) was mostly masked by other noise sources. Occasional impact noise 56 dBA. Other: Council Truck 60-77 dBA Distant Traffic 52 - 58 dBA

IA indicates “inaudible”, NM indicates “not measurable”.

Table 8 *Attended measurement and on-site real time monitor results*

Survey Location	Survey Start Date Time	Overall off-site measurements				Site $L_{Amax\ 15\ min}$	Site $L_{Aeq\ 15min}$ Contribution	On-Site real time monitor results			
		L_{Amax} 15min	L_{Aeq} 15min	L_{A10} 15min	L_{A90} 15min			L_{Amax} 15min	L_{Aeq} 15min	L_{A10} 15min	L_{A90} 15min
NCA 2	30/10/2023 20:45	80	68	73	54	Nil	Nil	67	51	55	46
NCA 2	30/10/2023 21:00	84	68	72	53	Nil	Nil	72	52	54	45
NCA 3	30/10/2023 21:30	73	52	50	45	~50	< 30	71	54	56	45

Survey Location	Survey Start Date Time	Overall off-site measurements				Site $L_{Amax\ 15\ min}$	Site $L_{Aeq\ 15min}$ Contribution	On-Site real time monitor results			
		L_{Amax} 15min	L_{Aeq} 15min	L_{A10} 15min	L_{A90} 15min			L_{Amax} 15min	L_{Aeq} 15min	L_{A10} 15min	L_{A90} 15min
NCA 3	30/10/2023 21:45	83	66	51	43	~50	~ 30	76	57	59	45
NCA 3	30/10/2023 22:01	73	53	51	45	53	< 35	72	53	57	46
NCA 1	30/10/2023 21:15	80	89	54	41	Nil	Nil	68	50	53	44
NCA 1	30/10/2023 21:30	84	58	50	40	44	< 30	71	54	56	45
NCA 1	30/10/2023 21:45	78	59	55	41	50	< 30	76	57	59	45
NCA 1	30/10/2023 22:00	80	60	58	42	47	< 30	72	53	57	46
NCA1	31/10/23 09:30	81	64	69	44	45	< 45	70	59	61	55
NCA2	31/10/23 10:30	85	71	75	64	NM	Nil	84	77	80	56
NCA3	31/10/23 09:15	82	65	71	49	51	50	75	61	65	56
NCA1	31/10/23 12:00	94	66	69	52	~45	< 40	72	61	63	57
NCA2	31/10/23 11:30	90	73	76	65	NM	Nil	89	69	72	61

Survey Location	Survey Start Date Time	Overall off-site measurements				Site $L_{Amax\ 15\ min}$	Site $L_{Aeq\ 15min}$ Contribution	On-Site real time monitor results			
		L_{Amax} 15min	L_{Aeq} 15min	L_{A10} 15min	L_{A90} 15min			L_{Amax} 15min	L_{Aeq} 15min	L_{A10} 15min	L_{A90} 15min
NCA3	31/10/23 09:30	74	56	54	48	56	50	70	59	61	55
NCA3	31/10/23 11:00	79	57	55	48	56	50	83	60	62	55

5.1 ASSESSMENT OF ANNOYING CHARACTERISTICS

5.1.1 LOW FREQUENCY NOISE

Site was occasionally audible but not the dominant noise source. A low frequency assessment could not be undertaken.

5.1.2 TONALITY

Site was occasionally audible but not the dominant noise source. A tonality assessment could not be undertaken.

5.1.3 INTERMITTENT NOISE

The penalty for intermittency is only applicable to the night time assessment period. This noise survey was undertaken during day and evening time, and so this potential penalty does not apply to results in this report.

5.1.4 DURATION

Site is operational for more than 2.5 hours each day, and so no 'duration' modifications apply.

5.2 SUMMARY OF OBSERVATIONS

The site was audible but other noise sources dominated the ambient acoustic environment during all measurements. All measurements complied with noise targets set in the Operational Noise Management Plan.

6 OPERATIONAL NOISE MANAGEMENT IMPROVEMENTS

6.1 NOISE WALL UNDER CONSTRUCTION

RCA attended site on the 31st of October 2023 and observed that a 3 m high, concrete block wall on the eastern boundary (shielding the green shredder area) was under construction. A photo of this is shown below.

Figure 2 *Green waste area noise wall under construction*

6.2 GREEN SHREDDER SOUND POWER

Concrush engage a contractor to provide the green shredding on site. The green shredder has previously been identified as a primary noise source and was responsible for a minor noise exceedance reported in May 2023 (RCA report 13155-616/1). Each contractor brings different plant to site with a different sound power. **Table 9** shows the varying sound powers measured on site by RCA of different shredding plant. It is shown that the current October 2023 shredding contractor is using significantly quieter plant compared to the shredder that caused the minor offsite noise exceedance in May 2023.

Table 9 *Green Shredder sound power*

Measurement	Measured Green Shredder sound power, dBA
2018	114
May 2023	122
October 2023	116

7 CONCLUSION

Noise levels from the Concrush site complied with noise targets adopted in the ONMP at all monitoring locations during both day and evening assessment periods. RCA also observed that a noise wall was under construction around the green waste shredding area, and that the current shredding contractor is using significantly quieter plant compared to the plant that caused a minor noise exceedance in May 2023. These two points demonstrate that Concrush are working towards continual improvement of their operational noise management.

Yours faithfully

RCA AUSTRALIA

Zaryab Ali
Acoustic Technician

REFERENCES

[1] Standards Australia, AS1055 (2018): Acoustics – Description and measurement of environmental noise.

[2] The Noise Policy for Industry (NSW EPA, 2017)

[3] Operational Noise Management Plan for Concrush Pty Ltd Teralba Facility

GLOSSARY

dB (A) ..... Unit of sound pressure level, modified by the A-weighting network to represent the sensitivity of the human ear.

SPL (Lp) ..... The incremental variation of sound pressure from the reference pressure level expressed in decibels.

L_{eq} ..... Equivalent continuous noise level averaged over time on an equivalent energy basis.

L_1 ..... Average Peak Noise Level in a measurement period.

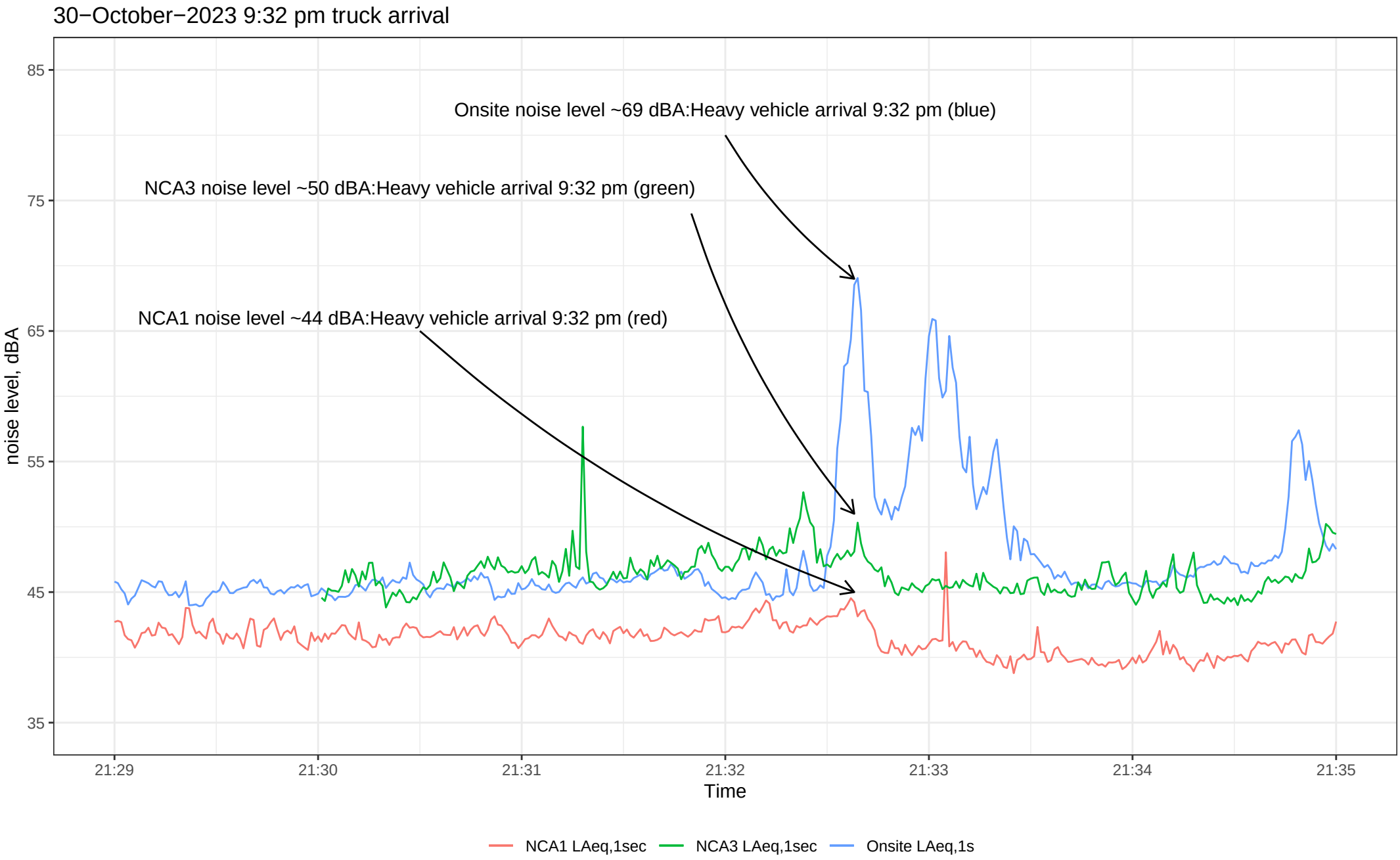
L_{10} ..... Average Maximum Noise Level in a measurement period.

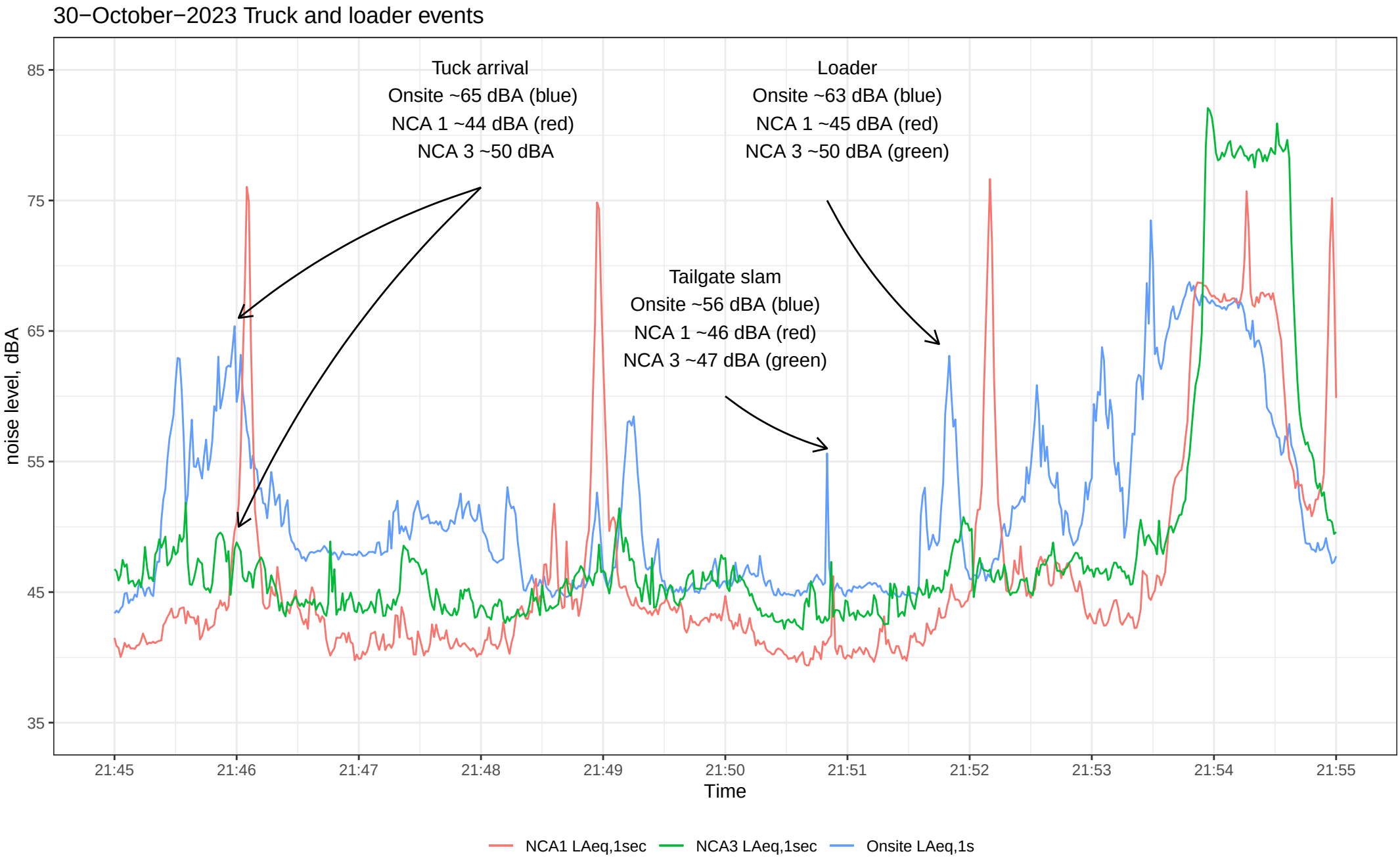
L_{90} ..... Average Minimum Noise Level in a measurement period.

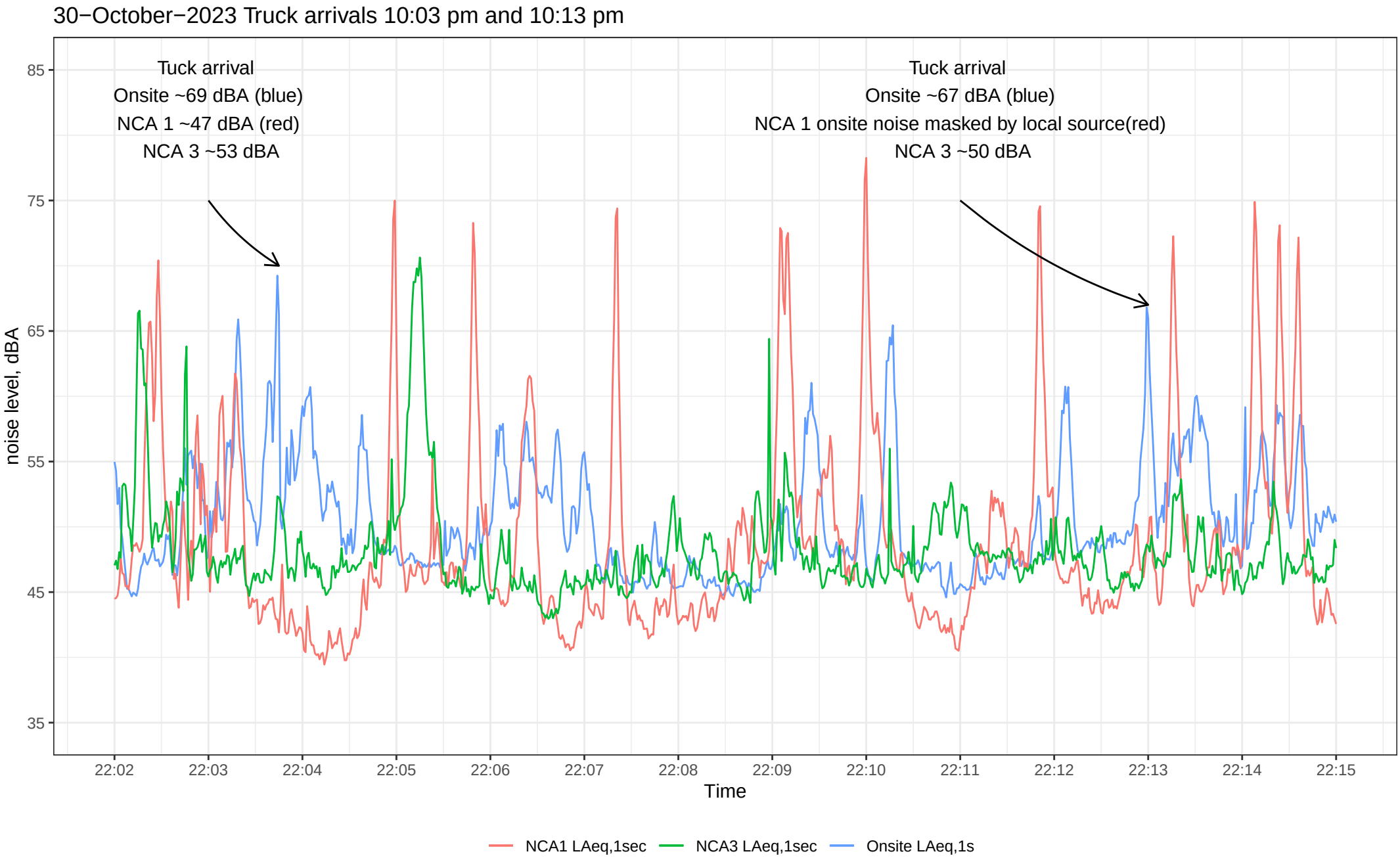
1/3 Octave ..... Division of frequencies into bands of width one-third of an octave. Sound data can be calculated for each division.

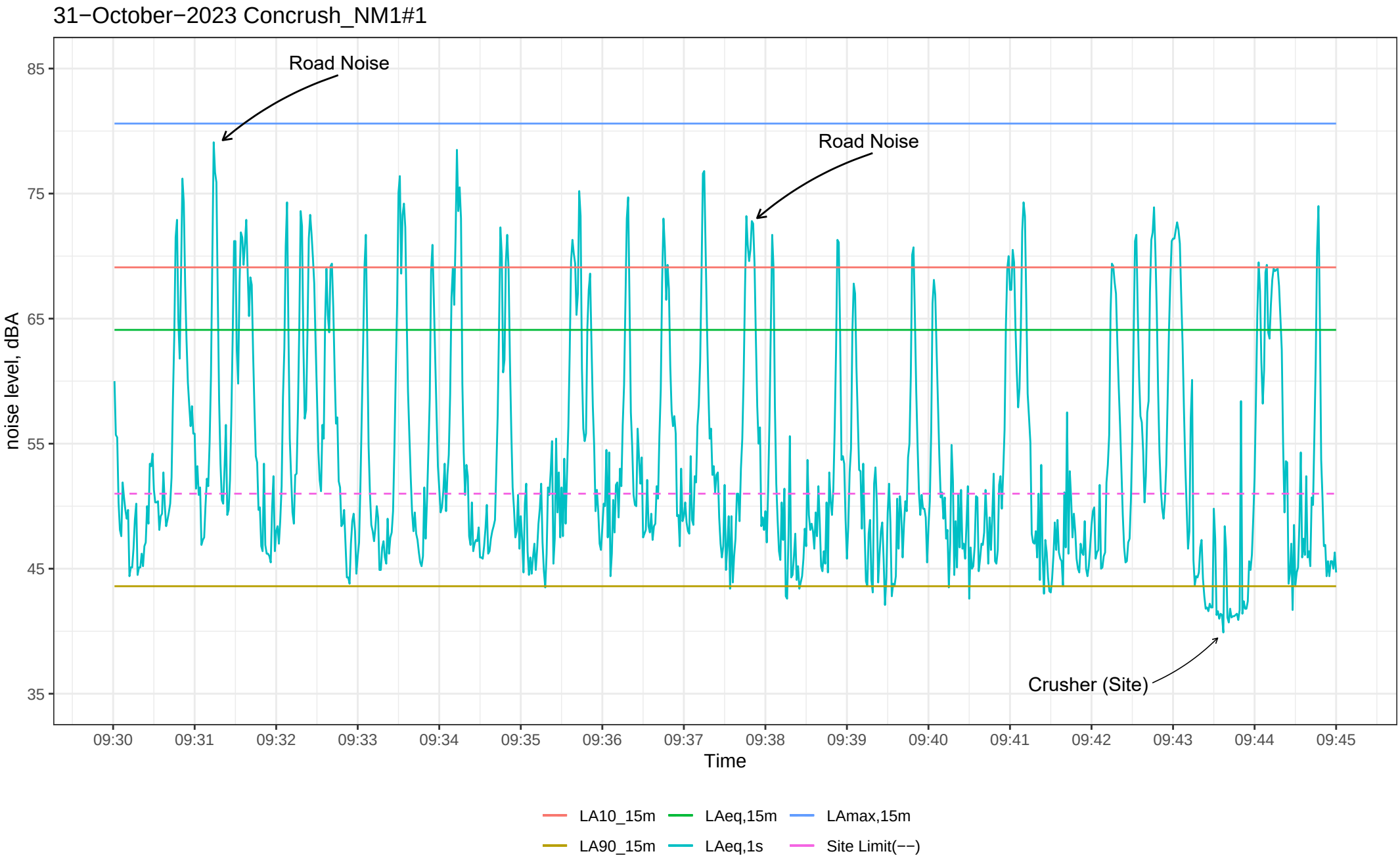
Appendix A

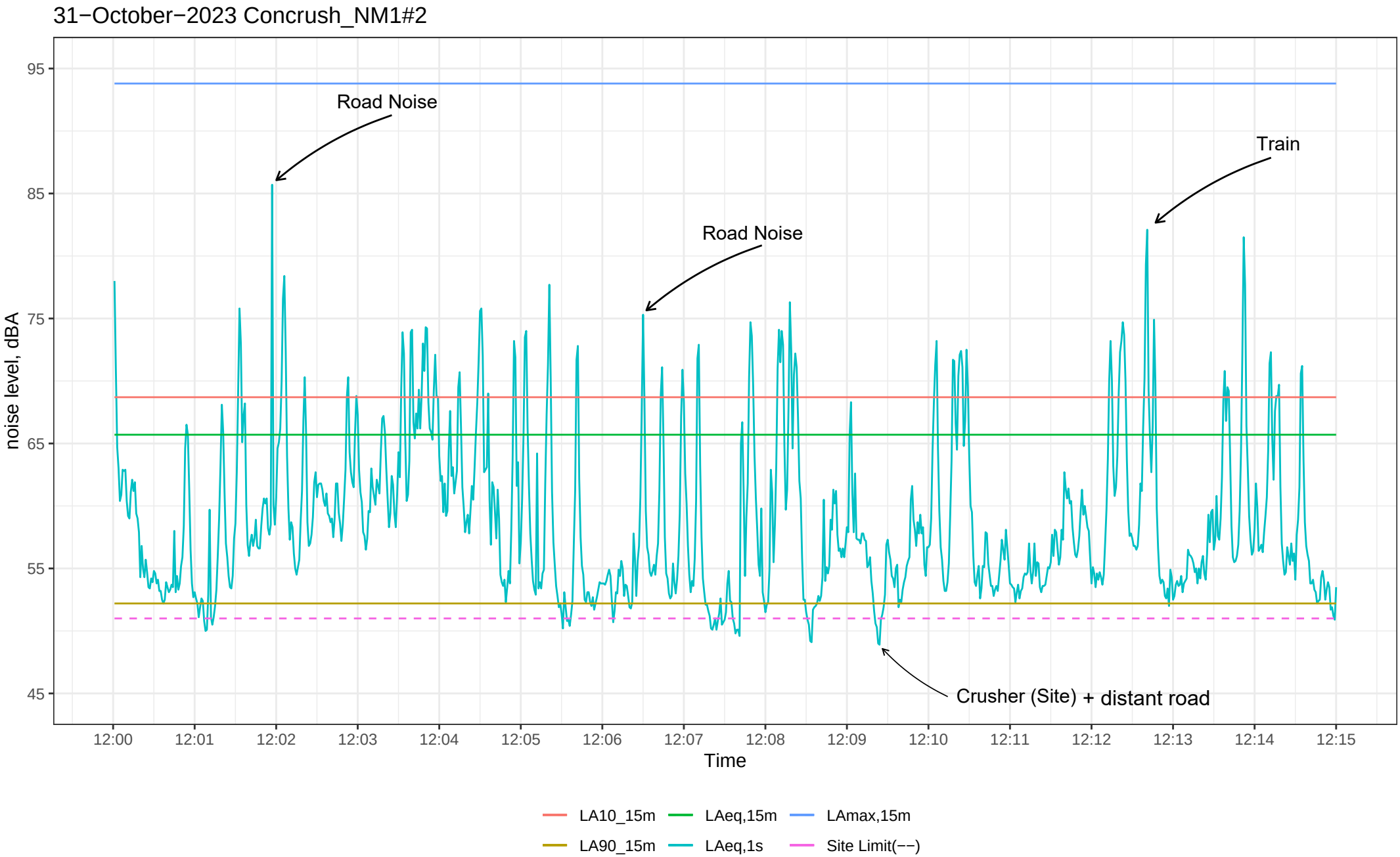
Survey Time Traces

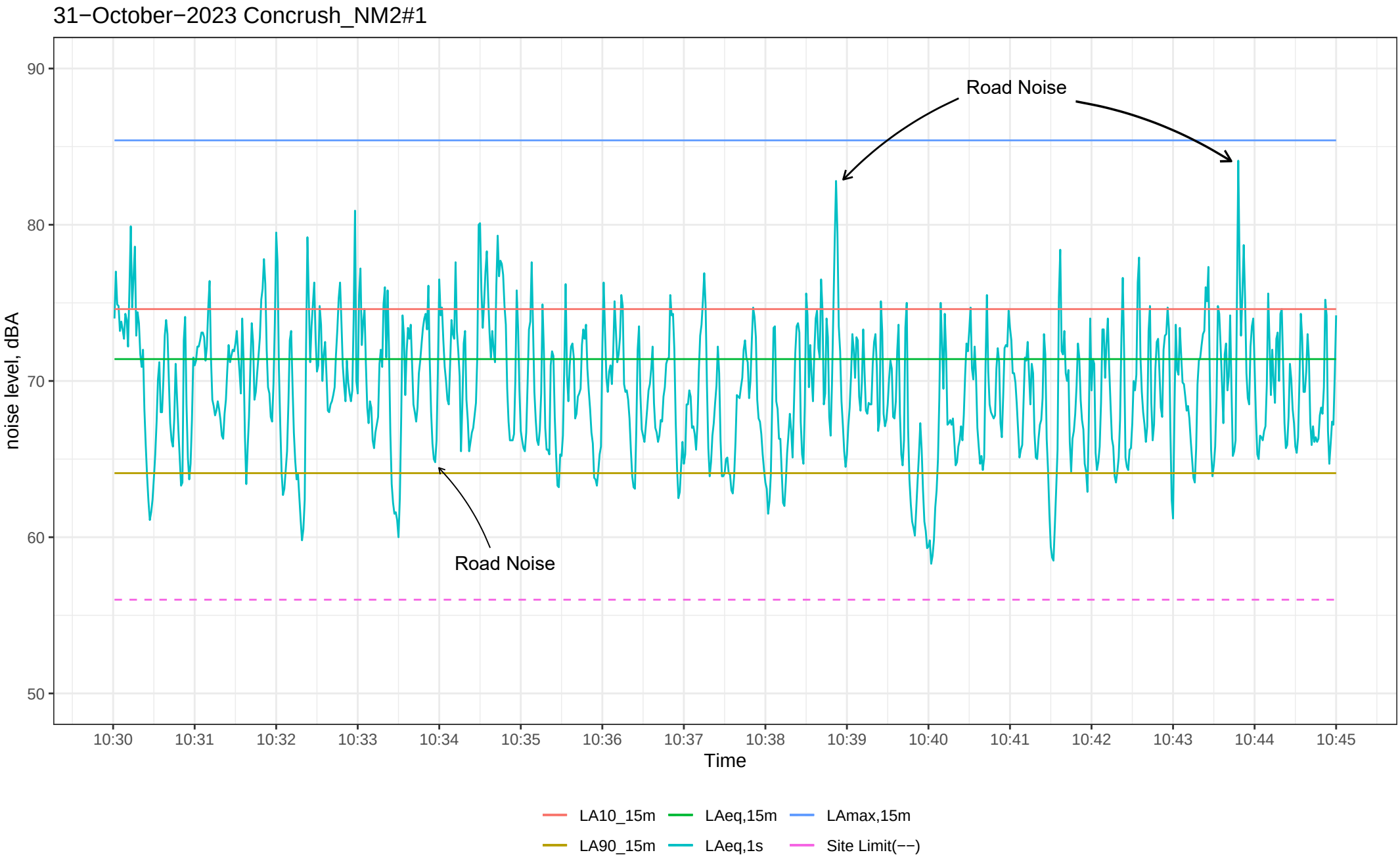

30−October−2023 9:32 pm truck arrival
Onsite noise level ~69 dBA:Heavy vehicle arrival 9:32 pm (blue)
NCA3 noise level ~50 dBA:Heavy vehicle arrival 9:32 pm (green)
NCA1 noise level ~44 dBA:Heavy vehicle arrival 9:32 pm (red)
noise level, dBA
85
75
65
55
45
35
21:29
21:30
21:31
21:32
21:33
21:34
21:35
Time
NCA1 LAeq,1sec
NCA3 LAeq,1sec
Onsite LAeq,1s

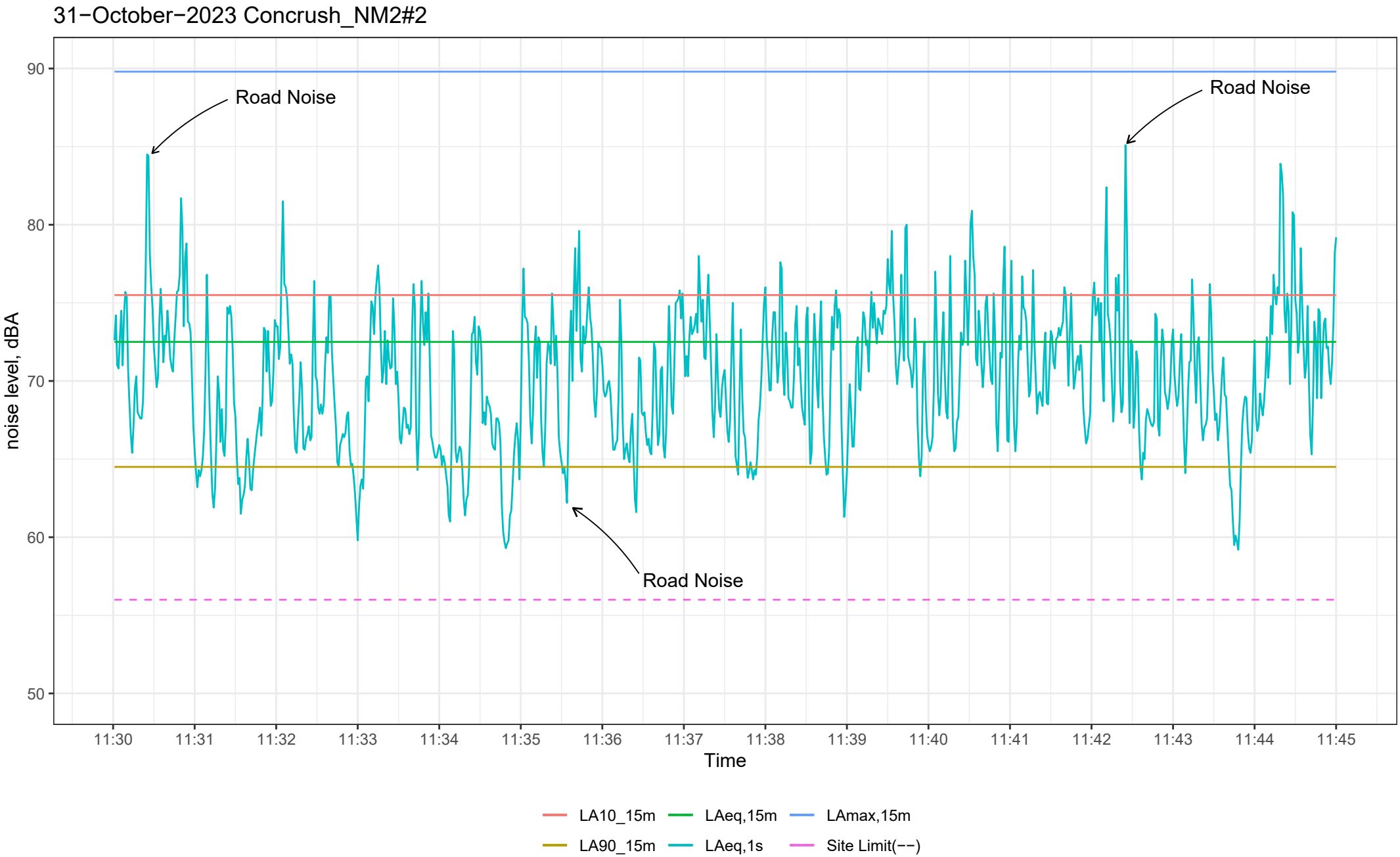

30−October−2023 Truck and loader events
Tuck arrival
Onsite ~65 dBA (blue)
NCA 1 ~44 dBA (red)
NCA 3 ~50 dBA
Loader
Onsite ~63 dBA (blue)
NCA 1 ~45 dBA (red)
NCA 3 ~50 dBA (green)
Tailgate slam
Onsite ~56 dBA (blue)
NCA 1 ~46 dBA (red)
NCA 3 ~47 dBA (green)
noise level, dBA
85
75
65
55
45
35
21:45
21:46
21:47
21:48
21:49
21:50
21:51
21:52
21:53
21:54
21:55
Time
NCA1 LAeq,1sec
NCA3 LAeq,1sec
Onsite LAeq,1s

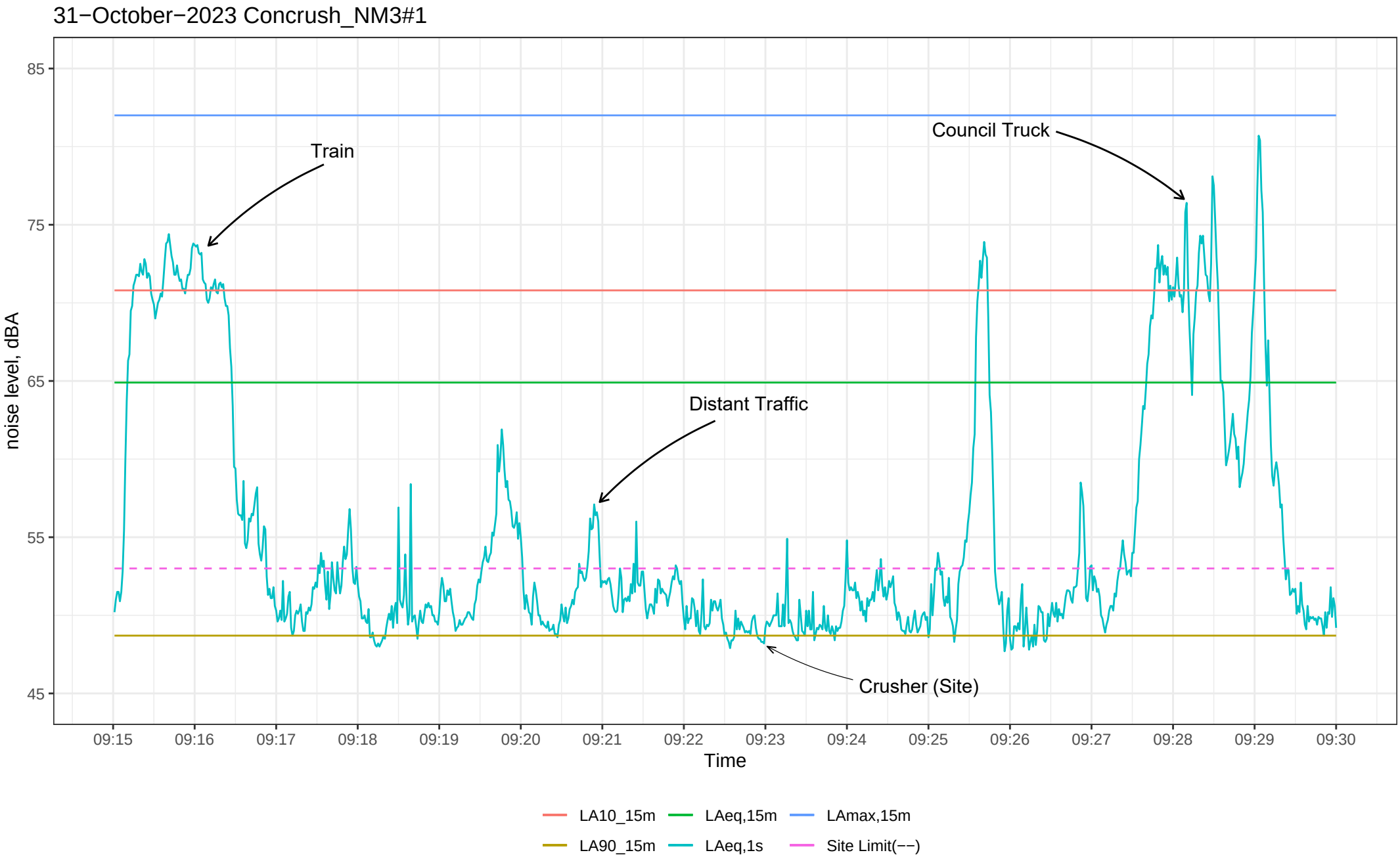

30−October−2023 Truck arrivals 10:03 pm and 10:13 pm
Tuck arrival
Onsite ~69 dBA (blue)
NCA 1 ~47 dBA (red)
NCA 3 ~53 dBA
Tuck arrival
Onsite ~67 dBA (blue)
NCA 1 onsite noise masked by local source(red)
NCA 3 ~50 dBA
noise level, dBA
85
75
65
55
45
35
22:02
22:03
22:04
22:05
22:06
22:07
22:08
22:09
22:10
22:11
22:12
22:13
22:14
22:15
Time
NCA1 LAeq,1sec
NCA3 LAeq,1sec
Onsite LAeq,1s

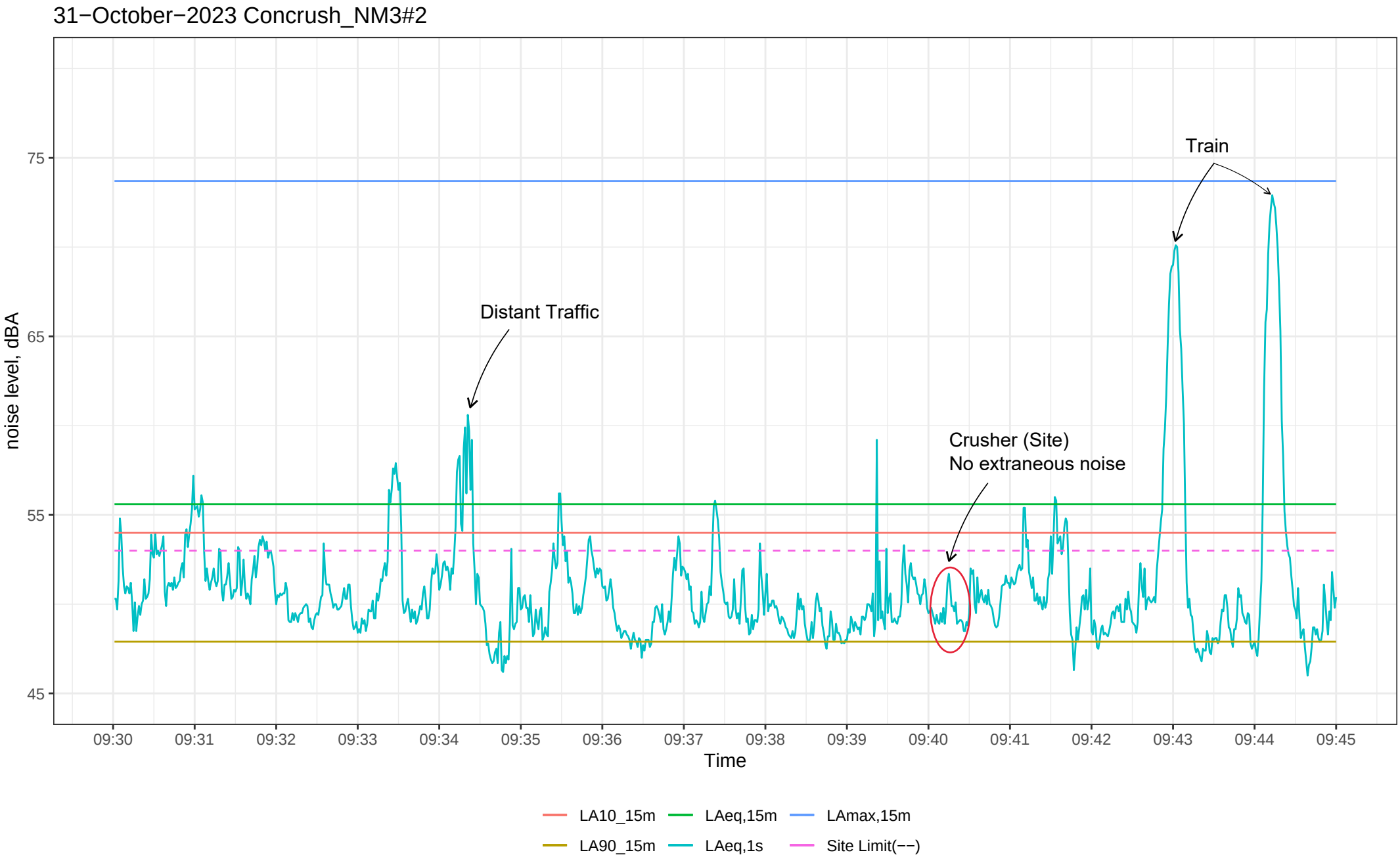

31−October−2023 Concrush_NM1#1
Road Noise
Road Noise
Crusher (Site)
noise level, dBA
85
75
65
55
45
35
09:30
09:31
09:32
09:33
09:34
09:35
09:36
09:37
09:38
09:39
09:40
09:41
09:42
09:43
09:44
09:45
Time
LA10_15m
LAeq,15m
LAmax,15m
LA90_15m
LAeq,1s
Site Limit(−−)

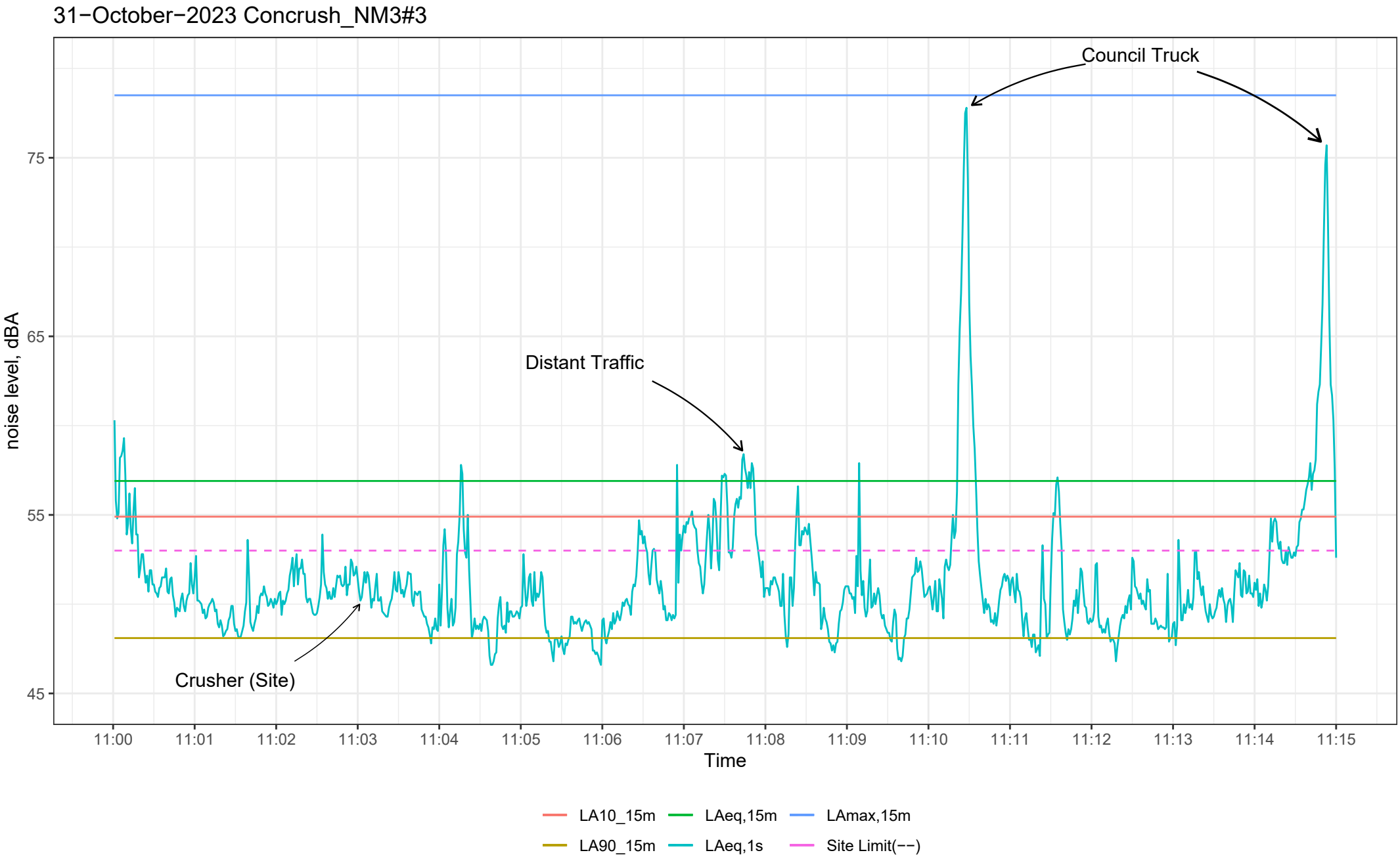

31−October−2023 Concrush_NM1#2
95
85
75
65
55
45
noise level, dBA
Road Noise
Road Noise
Train
Crusher (Site) + distant road
12:00
12:01
12:02
12:03
12:04
12:05
12:06
12:07
12:08
12:09
12:10
12:11
12:12
12:13
12:14
12:15
Time
LA10_15m
LAeq,15m
LAmax,15m
LA90_15m
LAeq,1s
Site Limit(−−)


31−October−2023 Concrush_NM2#1
Road Noise
Road Noise
noise level, dBA
90
80
70
60
50
10:30
10:31
10:32
10:33
10:34
10:35
10:36
10:37
10:38
10:39
10:40
10:41
10:42
10:43
10:44
10:45
Time
LA10_15m
LAeq,15m
LAmax,15m
LA90_15m
LAeq,1s
Site Limit(−−)


31−October−2023 Concrush_NM2#2
Road Noise
Road Noise
Road Noise
noise level, dBA
90
80
70
60
50
11:30
11:31
11:32
11:33
11:34
11:35
11:36
11:37
11:38
11:39
11:40
11:41
11:42
11:43
11:44
11:45
Time
LA10_15m
LAeq,15m
LAmax,15m
LA90_15m
LAeq,1s
Site Limit(−−)


31−October−2023 Concrush_NM3#1
85
75
65
55
45
noise level, dBA
Train
Council Truck
Distant Traffic
Crusher (Site)
09:15
09:16
09:17
09:18
09:19
09:20
09:21
09:22
09:23
09:24
09:25
09:26
09:27
09:28
09:29
09:30
Time
LA10_15m
LAeq,15m
LAmax,15m
LA90_15m
LAeq,1s
Site Limit(−−)


31−October−2023 Concrush_NM3#2
noise level, dBA
75
65
55
45
09:30
09:31
09:32
09:33
09:34
09:35
09:36
09:37
09:38
09:39
09:40
09:41
09:42
09:43
09:44
09:45
Time
Train
Distant Traffic
Crusher (Site)
No extraneous noise
LA10_15m
LAeq,15m
LAmax,15m
LA90_15m
LAeq,1s
Site Limit(−−)


31−October−2023 Concrush_NM3#3
Council Truck
Distant Traffic
Crusher (Site)
noise level, dBA
75
65
55
45
11:00
11:01
11:02
11:03
11:04
11:05
11:06
11:07
11:08
11:09
11:10
11:11
11:12
11:13
11:14
11:15
Time
LA10_15m
LAeq,15m
LAmax,15m
LA90_15m
LAeq,1s
Site Limit(−−)