



Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley

Monthly Report 2

22.08.2022 - 21.09.2022

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Attention To	Hazell Bros

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TABLE OF CONTENTS

1	INTRODUCTION	4
1.1	SITE DESCRIPTION AND SENSITIVE RECEIVERS	4
2	CONSTRUCTION NOISE, DUST & VIBRATION MANAGEMENT LEVELS	6
2.1	VIBRATION MONITORING OBJECTIVES	6
2.2	NOISE MONITORING OBJECTIVES	7
2.3	DUST MONITORING OBJECTIVES	7
3	MONITOR/MEASUREMENT EQUIPMENT AND LOCATIONS	8
3.1	VIBRATION MONITOR	8
3.1.1	Measurement Equipment	8
3.1.2	Measurement Locations & Installation Dates	8
3.2	NOISE AND DUST MONITOR	8
3.2.1	Measurement Equipment	8
3.2.2	Measurement Locations & Installation Dates	8
4	NOISE, DUST & VIBRATION MEASUREMENTS	9
4.1	MONITORING PERIOD	9
4.2	VIBRATION MONITORING RESULTS	9
4.3	NOISE MONITORING RESULTS	11
4.4	DUST MONITORING RESULTS	13
5	CONCLUSION	17
	APPENDIX 1 – NOISE MONITORING RESULTS	18
	APPENDIX 2 – VIBRATION MONITORING RESULTS	50
	APPENDIX 3 – DUST MONITORING RESULTS	51

1 INTRODUCTION

Acoustic Logic has been engaged to carry out noise, dust and vibration monitoring for the impacts associated with the upgrade the existing road infrastructure of Tweed Coast Road/Cudgen Road intersection to service increased demand following the completion of the Tweed Valley Hospital.

This report provides the results of the following monitoring items:

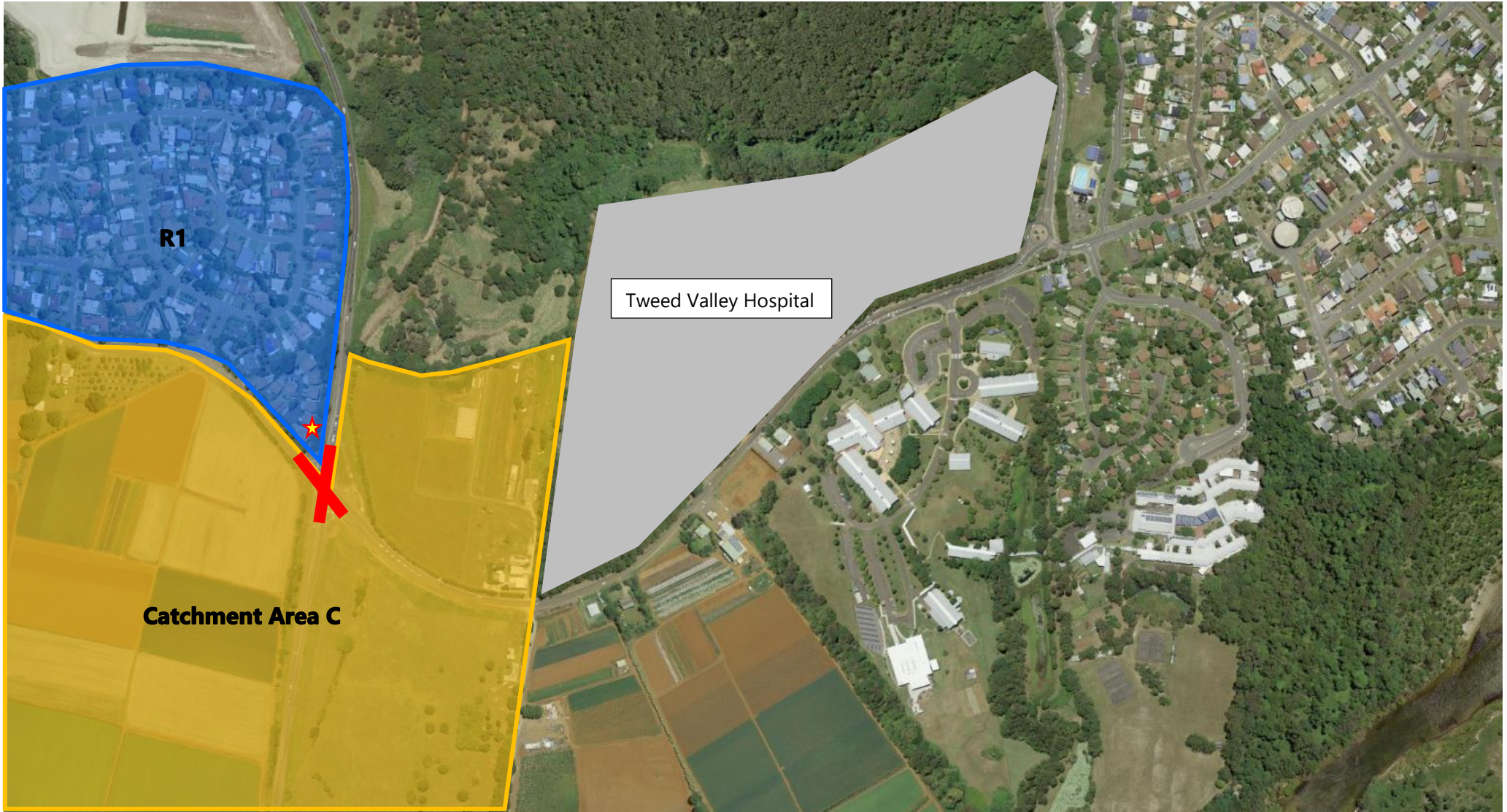
- Vibration Monitoring: 22nd of August to 21st of September 2022
- Noise Monitoring: 22nd of August to 21st of September 2022, and
- Dust Monitoring: 22nd of August to 21st of September 2022.

Unattended noise, dust and vibration monitoring has been carried out with reference to the management levels identified in the *Construction Noise, Dust & Vibration Management Plan (CNVMP)* for Tweed Valley Hospital Carpark the site prepared by AL (ref: 20211491.1/2911A/R2/OB, dated 29/11/2021). The criteria set up in the above management plan will be adopted to the proposed intersection upgrade site.

1.1 SITE DESCRIPTION AND SENSITIVE RECEIVERS

The subject site is located at Tweed Coast Road/Cudgen Road intersection, Kingscliff as indicated in Figure 1-1. The land uses surrounding the intersection are existing residential and agricultural receivers. The nearest potentially most affected receivers are:

- **Residential Receiver R1:** Residential receivers at 6-30 John Robb Way to the north of the proposed construction site
- **Industrial/Agricultural Receiver 1:** Catchment Area C to the south of the proposed construction site



- Industrial/Agricultural
- Proposed road upgrade location
- Monitoring Location

Figure 1-1 – Project Site and Sensitive Receiver Locations

- Tweed Valley Hospital
- Residential Receiver

2 CONSTRUCTION NOISE, DUST & VIBRATION MANAGEMENT LEVELS

Noise, dust and vibration management levels which are presented below have been adopted from the following documents:

- Tweed Valley Hospital Carpark *Construction Noise, Dust and Vibration Management Plan* (CNVMP), Acoustic Logic (ref: 20211491.1/2911A/R2/OB, dated 29/11/2021)
- For structural damage vibration, German Standard DIN 4150-3 *Structural Vibration: Effects of Vibration on Structures*, and
- For human exposure to vibration, the NSW EPA document *Assessing Vibration: A Technical Guideline*.

2.1 VIBRATION MONITORING OBJECTIVES

German Standard DIN 4150-3 provides vibration velocity guideline levels for use in evaluating the effects of vibration on structures. The criteria presented in DIN 4150-3 are presented in Table 2-1.

It is noted that the peak velocity is the absolute value of the maximum of any of the three orthogonal component particle velocities as measured at the foundation, and the maximum levels measured in the x- and y-horizontal directions in the plane of the floor of the uppermost storey.

Table 2-1 – DIN4150-3 Safe Limits for Building Vibration

TYPE OF STRUCTURE		PEAK PARTICLE VELOCITY (mms ⁻¹)			
		At Foundation at a Frequency of			Plane of Floor of Uppermost Storey
		< 10Hz	10Hz to 50Hz	50Hz to 100Hz	All Frequencies
1	Buildings used in commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40
2	Dwellings and buildings of similar design and/or use Receivers R1	5	5 to 15	15 to 20	15
3	Structures that because of their particular sensitivity to vibration, do not correspond to those listed in Lines 1 or 2 and have intrinsic value (e.g. buildings that are under a preservation order)	3	3 to 8	8 to 10	8

The surrounding residential properties are considered type 2 structures and are the most sensitive receivers as such vibration will be assessed to the Type 2 criteria.

2.2 NOISE MONITORING OBJECTIVES

Project specific noise construction noise management levels are outlined in the approved CNVMP and summarised in Table 2-2 below:

Table 2-2 – Summarised Construction Noise Requirements During Proposed Hours

“Noise Affected” Level - dB(A) _{Leq(15min)} Standard Hours	“Highly Noise Affected” Level - dB(A) _{Leq(15min)}
55 externally at façade	75

2.3 DUST MONITORING OBJECTIVES

Dust monitoring has been conducted to measure mechanically generated respirable PM_{2.5} dust particles (< 2.5µm) and PM₁₀ dust particles (< 10µm), which are generally understood to be the main health concern in airborne dust. The air quality limits are based on the standards outlined in Department of the Environment’s *National Environment Protection (Ambient Air Quality) Measure* and NSW EPA’s air quality categories.

It should be noted that the dust monitoring results can be influenced by events such as fires and dust storms, thus the PM₁₀ limit has an allowance of 5 days per year to account for the effects of such events.

The PM_{2.5} and PM₁₀ goals are summarised below.

Table 3 – PM_{2.5} and PM₁₀ Goals (24-Hour Average)

Pollutant	Averaging Time	Maximum Concentration
PM _{2.5}	24 hours	25 µg/m ³
PM ₁₀	24 hours	50 µg/m ³

The EPA has air quality categories based on particle concentration over a one hour average. As per the Construction Noise, Dust and Vibration management Plan, this project has targeted the ‘Poor’ category as a reference, **however, the assessment level is the 24-hour average.**

Table 4 – PM_{2.5} and PM₁₀ Goals (1-Hour Average)

Pollutant	Air Quality Category	Maximum Concentration
PM _{2.5}	Poor	62-97 µg/m ³
PM ₁₀		80-120 µg/m ³

3 MONITOR/MEASUREMENT EQUIPMENT AND LOCATIONS

3.1 VIBRATION MONITOR

3.1.1 Measurement Equipment

Vibration monitoring was conducted using Texcel ETM vibration monitors with external Tri-axial Geophones. The monitors are programmed to store statistical vibration data every 5-minute intervals, along with any 'triggered' events that occur throughout the monitoring period.

3.1.2 Measurement Locations & Installation Dates

A vibration monitor (M7394) has been installed, representative of the potential impact for vibration transmission to surrounding residential houses, at the northern boundary of the construction site (at the ground level, also see Figure 3-1). The monitor was installed on Friday 22nd July 2022.

3.2 NOISE AND DUST MONITOR

3.2.1 Measurement Equipment

Unattended noise monitoring was conducted using a *SiteHive Hexanode 134* noise and dust monitor. The monitor was programmed to store 15-minute statistical noise levels throughout the monitoring period. Measurements were taken on A-frequency weighting and fast time weighting.

3.2.2 Measurement Locations & Installation Dates

A noise monitor has been installed, representative of the potential impact for noise transmission to surrounding residential houses, at the northern boundary of the construction site (at the ground level, also see Figure below). The monitor was installed on Friday 22nd July 2022.



Figure 3-1 Noise, dust and vibration monitor installation locations

4 NOISE, DUST & VIBRATION MEASUREMENTS

4.1 MONITORING PERIOD

This report provides the available results of noise, dust and vibration monitoring between the 22nd August 2022 and 21st September 2022.

4.2 VIBRATION MONITORING RESULTS

The highest axial (transverse / radial / vertical) vibration level, Peak Particle Velocity (PPV), during the monitoring period have been presented below. Graphs of the results are presented in Appendix A.

Table 5 – Vibration Monitoring Results-M7394

Date	Maximum Measured Vibration Level mm/s	Structural Damage Criteria for Type 2 (DIN4150-3)	Comments
Monday 2022-08-22	<3mm/s	5 mm/s (<10Hz) 5-15 mm/s (10-50Hz) 15-20mm/s (50-100Hz)	Vibration levels satisfy DIN4150-3 Type 2 criteria
Tuesday 2022-08-23	<3mm/s		
Wednesday 2022-08-24	<3mm/s		
Thursday 2022-08-25	<3mm/s		
Friday 2022-08-26	<3mm/s		
Saturday 2022-08-27	<3mm/s		
Sunday 2022-08-28	No work		
Monday 2022-08-29	<3mm/s		
Tuesday 2022-08-30	<3mm/s		
Wednesday 2022-08-31	<3mm/s		
Thursday 2022-09-01	<3mm/s		
Friday 2022-09-02	<3mm/s		
Saturday 2022-09-03	<3mm/s		

Date	Maximum Measured Vibration Level mm/s	Structural Damage Criteria for Type 2 (DIN4150-3)	Comments
Sunday 2022-09-04	No work		Vibration levels satisfy DIN4150-3 Type 2 criteria
Monday 2022-09-05	<3mm/s		
Tuesday 2022-09-06	<3mm/s		
Wednesday 2022-09-07	<3mm/s		
Thursday 2022-09-08	<3mm/s		
Friday 2022-09-09	<3mm/s		
Saturday 2022-09-10	<3mm/s		
Sunday 2022-09-11	No work	5 mm/s (<10Hz)	
Monday 2022-09-12	<3mm/s	5-15 mm/s (10-50Hz)	
Tuesday 2022-09-13	<3mm/s	15-20mm/s (50-100Hz)	
Wednesday 2022-09-14	<3mm/s		
Thursday 2022-09-15	<3mm/s		
Friday 2022-09-16	<3mm/s		
Saturday 2022-09-17	<3mm/s		
Sunday 2022-09-18	No work		
Monday 2022-09-19	<3mm/s		
Tuesday 2022-09-20	<3mm/s		
Wednesday 2022-09-21	<3mm/s		

Vibration levels for monitor M7394 to the north of the construction site were within the nominated criteria for the whole monitoring period between 22nd August to 21st September 2022.

4.3 NOISE MONITORING RESULTS

The available measured noise levels have been analysed by this office and the graphed noise data presented in Appendix 1. Summarised results are also in Table 6 below.

Table 6 – Measured Construction Noise Levels @ R1

Date	Time Period	Percentage of Time that Measured Noise Level dB(A) _{L_{eq}(15min)} Exceeds			
		0-5 above Noise affected level 55 dB(A) _{L_{eq}(15min)}	5-10 above Noise affected level 55 dB(A) _{L_{eq}(15min)}	10-15 above Noise affected level 55 dB(A) _{L_{eq}(15min)}	Above Highly Noise affected level 75 dB(A) _{L_{eq}(15min)}
Monday 2022-08-22	7am – 6pm	15.91%	84.09%	0.00%	0.00%
Tuesday 2022-08-23		47.73%	52.27%	0.00%	0.00%
Wednesday 2022-08-24		63.64%	36.36%	0.00%	0.00%
Thursday 2022-08-25		43.18%	56.82%	0.00%	0.00%
Friday 2022-08-26		9.09%	90.91%	0.00%	0.00%
Saturday 2022-08-27	8am – 1pm	57.14%	42.86%	0.00%	0.00%
Sunday 2022-08-28	No Works				
Monday 2022-08-29	7am – 6pm	22.73%	77.27%	0.00%	0.00%
Tuesday 2022-08-30		6.82%	93.18%	0.00%	0.00%
Wednesday 2022-08-31		2.27%	93.18%	4.55%	0.00%
Thursday 2022-09-01		6.82%	93.18%	0.00%	0.00%
Friday 2022-09-02		0.00%	100.00%	0.00%	0.00%
Saturday 2022-09-03	8am – 1pm	38.10%	61.90%	0.00%	0.00%
Sunday 2022-09-04	No Works				

Date	Time Period	Percentage of Time that Measured Noise Level dB(A) _{Leq(15min)} Exceeds			
		0-5 above Noise affected level 55 dB(A) _{Leq(15min)}	5-10 above Noise affected level 55 dB(A) _{Leq(15min)}	10-15 above Noise affected level 55 dB(A) _{Leq(15min)}	Above Highly Noise affected level 75 dB(A) _{Leq(15min)}
Monday 2022-09-05	7am – 6pm	15.91%	81.82%	0.00%	0.00%
Tuesday 2022-09-06		38.64%	61.36%	0.00%	0.00%
Wednesday 2022-09-07		13.64%	86.36%	0.00%	0.00%
Thursday 2022-09-08		9.09%	90.91%	0.00%	0.00%
Friday 2022-09-09		6.82%	86.36%	6.82%	0.00%
Saturday 2022-09-10	8am – 1pm	90.48%	9.52%	0.00%	0.00%
Sunday 2022-09-11	No Works				
Monday 2022-09-12	7am – 6pm	13.64%	86.36%	0.00%	0.00%
Tuesday 2022-09-13		0.00%	86.36%	13.64%	0.00%
Wednesday 2022-09-14		20.45%	70.45%	9.09%	0.00%
Thursday 2022-09-15		13.64%	56.82%	29.55%	0.00%
Friday 2022-09-16		25.00%	75.00%	0.00%	0.00%
Saturday 2022-09-17	8am – 1pm	85.71%	14.29%	0.00%	0.00%
Sunday 2022-09-18	No Works				
Monday 2022-09-19	7am – 6pm	6.82%	93.18%	0.00%	0.00%
Tuesday 2022-09-20		6.82%	93.18%	0.00%	0.00%
Wednesday 2022-09-21		9.46%	58.11%	1.35%	0.00%

Noise levels were below the highly noise affected level (75dB(A)) during the whole monitoring period. Noise levels were normally between 5-10 dB higher than the noise affected level. This is expected to lower at the residential façade due to distance attenuation.

4.4 DUST MONITORING RESULTS

The daily average PM_{2.5} and PM₁₀ concentration levels are presented below.

Table 7 – 24hr Average PM_{2.5} and PM₁₀ Concentration

Date	24hr Average PM _{2.5} and PM ₁₀ Concentration					
	PM _{2.5} Level (µg/m ³)	PM _{2.5} Limit (µg/m ³)	Complies	PM ₁₀ Level (µg/m ³)	PM ₁₀ Limit (µg/m ³)	Complies
Monday 2022-08-22	7	25	Yes	28	50	Yes
Tuesday 2022-08-23	6		Yes	23		Yes
Wednesday 2022-08-24	2		Yes	10		Yes
Thursday 2022-08-25	4		Yes	30		Yes
Friday 2022-08-26	4		Yes	19		Yes
Saturday 2022-08-27	4		Yes	11		Yes
Sunday 2022-08-28	3		Yes	13		Yes
Monday 2022-08-29	5		Yes	18		Yes
Tuesday 2022-08-30	5		Yes	37		Yes
Wednesday 2022-08-31	9		Yes	37		Yes
Thursday 2022-09-01	7		Yes	29		Yes
Friday 2022-09-02	7		Yes	40		Yes
Saturday 2022-09-03	4		Yes	12		Yes
Sunday 2022-09-04	7		Yes	14		Yes
Monday 2022-09-05	8		Yes	24		Yes
Tuesday 2022-09-06	7		Yes	24		Yes

Date	24hr Average PM _{2.5} and PM ₁₀ Concentration					
	PM _{2.5} Level (µg/m ³)	PM _{2.5} Limit (µg/m ³)	Complies	PM ₁₀ Level (µg/m ³)	PM ₁₀ Limit (µg/m ³)	Complies
Wednesday 2022-09-07	6	25	Yes	38	50	Yes
Thursday 2022-09-08	4		Yes	18		Yes
Friday 2022-09-09	4		Yes	18		Yes
Saturday 2022-09-10	2		Yes	10		Yes
Sunday 2022-09-11	2		Yes	9		Yes
Monday 2022-09-12	3		Yes	18		Yes
Tuesday 2022-09-13	5		Yes	20		Yes
Wednesday 2022-09-14	7		Yes	27		Yes
Thursday 2022-09-15	4		Yes	17		Yes
Friday 2022-09-16	6		Yes	24		Yes
Saturday 2022-09-17	10		Yes	33		Yes
Sunday 2022-09-18	3		Yes	11		Yes
Monday 2022-09-19	4		Yes	19		Yes
Tuesday 2022-09-20	8		Yes	29		Yes
Wednesday 2022-09-21	10		Yes	30		Yes

Hourly averaged dust monitoring results comply with the criteria during the whole monitoring period.

The **daily maximum 1hour** PM_{2.5} and PM₁₀ concentration levels are presented below.

Table 8 – 1Hr Maximum PM_{2.5} and PM₁₀ Concentration

Date	Maximum 1hr Average PM _{2.5} and PM ₁₀ Concentration					
	PM _{2.5} Level (µg/m ³)	PM _{2.5} Limit (µg/m ³)	Complies	PM ₁₀ Level (µg/m ³)	PM ₁₀ Limit (µg/m ³)	Complies
Monday 2022-08-22	12	62-97	Yes	56	80-120	Yes
Tuesday 2022-08-23	10		Yes	42		Yes
Wednesday 2022-08-24	5		Yes	40		Yes
Thursday 2022-08-25	10		Yes	106		Yes Non construction works related
Friday 2022-08-26	7		Yes	37		Yes
Saturday 2022-08-27	5		Yes	17		Yes
Sunday 2022-08-28	7		Yes	54		Yes
Monday 2022-08-29	7		Yes	30		Yes
Tuesday 2022-08-30	22		Yes	495		Weather affected
Wednesday 2022-08-31	29		Yes	163		Weather affected
Thursday 2022-09-01	10		Yes	54		Yes
Friday 2022-09-02	29		Yes	162		Weather affected
Saturday 2022-09-03	14		Yes	37		Yes
Sunday 2022-09-04	16		Yes	36		Yes
Monday 2022-09-05	13		Yes	50		Yes
Tuesday 2022-09-06	11		Yes	55		Yes
Wednesday 2022-09-07	12	Yes	110	Yes Non construction works related		

Date	Maximum 1hr Average PM _{2.5} and PM ₁₀ Concentration					
	PM _{2.5} Level (µg/m ³)	PM _{2.5} Limit (µg/m ³)	Complies	PM ₁₀ Level (µg/m ³)	PM ₁₀ Limit (µg/m ³)	Complies
Thursday 2022-09-08	7	62-97	Yes	46	80-120	Yes
Friday 2022-09-09	14		Yes	55		Yes
Saturday 2022-09-10	5		Yes	31		Yes
Sunday 2022-09-11	4		Yes	25		Yes
Monday 2022-09-12	5		Yes	47		Yes
Tuesday 2022-09-13	11		Yes	57		Yes
Wednesday 2022-09-14	34		Yes	188		Heavy vehicle passing-by
Thursday 2022-09-15	6		Yes	34		Yes
Friday 2022-09-16	18		Yes	95		Yes Non construction works related
Saturday 2022-09-17	18		Yes	95		Yes Non construction works related
Sunday 2022-09-18	6		Yes	27		Yes
Monday 2022-09-19	6		Yes	35		Yes
Tuesday 2022-09-20	28		Yes	125		Heavy vehicle passing-by
Wednesday 2022-09-21	14		Yes	41		Yes

Maximum hourly averaged PM₁₀ exceedances on 30th, 31st August and 2nd September were resulted from severe weather conditions. Exceedances on 25th August and 7th, 16th and 17th September were recorded outside construction hours and unrelated to construction activities. Exceedances on 14th and 20th September were due to heavy vehicle/motor bike passing by the junction of Tweed Coast Road and Cudgen Road (evident by the video and audio recorded by the SiteHive system), and were found unrelated to the construction activities.

5 CONCLUSION

Acoustic Logic Consultancy has carried out noise, dust and vibration monitoring for the proposed intersection upgrade at Tweed Coast Road/Cudgen Road intersection, Tweed Valley.

This monitoring report presents the noise and vibration monitoring for the periods as follows:

- Vibration Monitoring: 22nd of August to 21st of September 2022
- Noise Monitoring: 22nd of August to 21st of September 2022, and
- Dust Monitoring: 22nd of August to 21st of September 2022.

Vibration levels were below the criteria during the whole monitoring period. Noise levels were normally below 10dB(A) exceedance of noise affected level (55dB(A)). This is believed to be lower at the closest residential receiver due to distance attenuation. Several dust measurements exceedances were recorded during the above monitoring period and as found due to extreme weather conditions, heavy vehicle passing-bys and were found unrelated to the construction works as per the results notes in this report.

Please contact us should you have any further queries.

Yours faithfully,

A handwritten signature in black ink, appearing to be 'J. Smith', written in a cursive style.

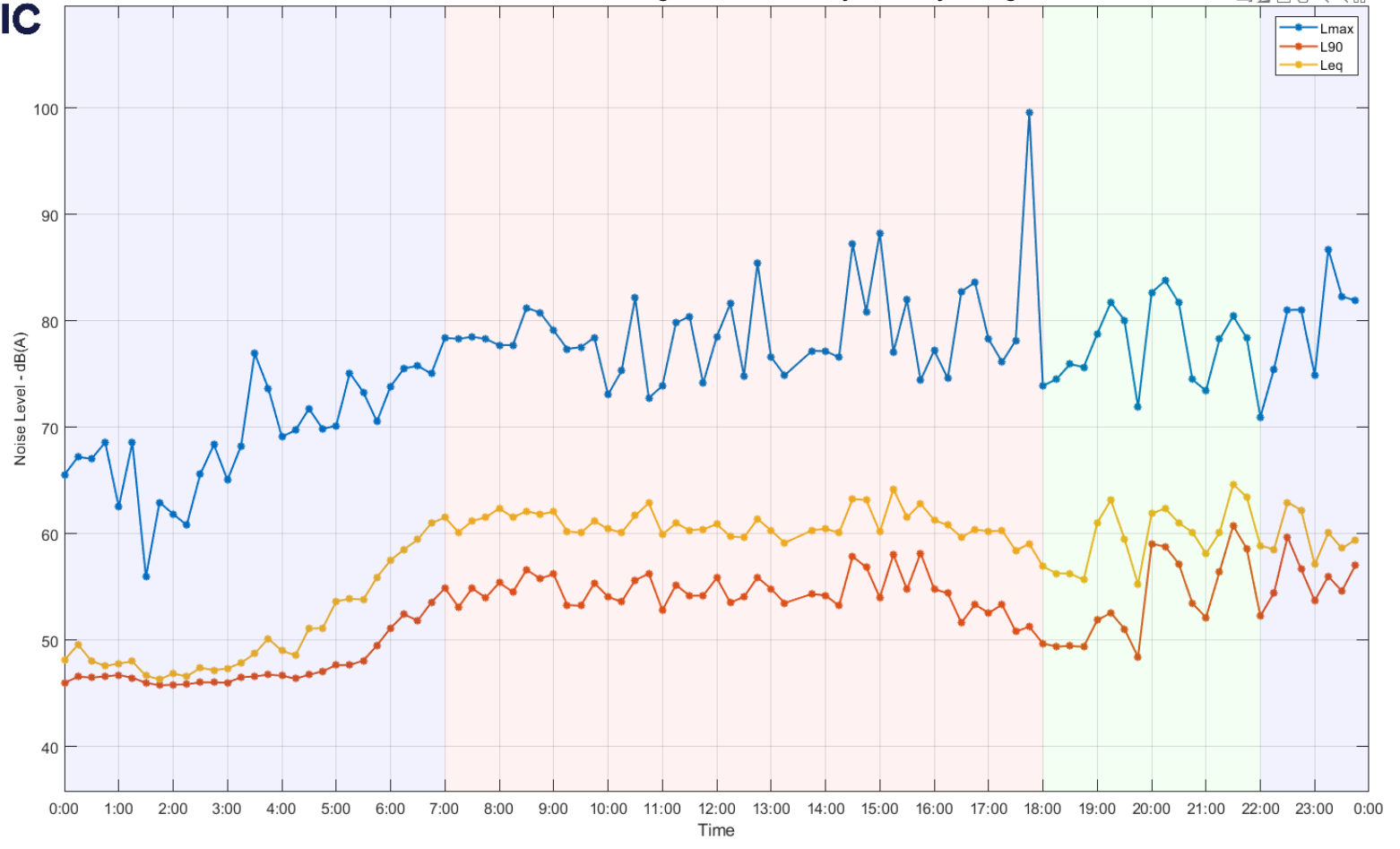
Acoustic Logic Pty Ltd



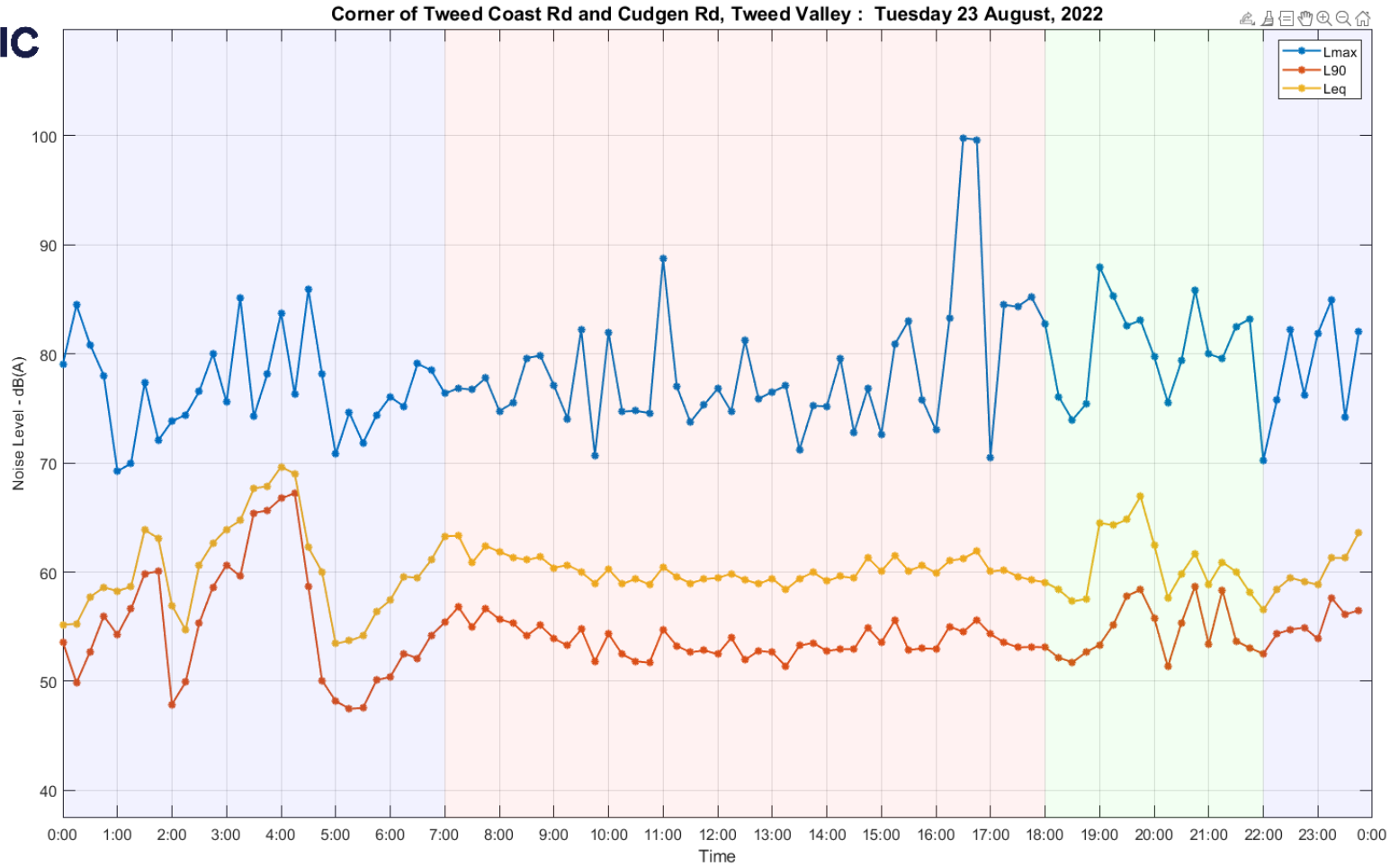
APPENDIX 1 – NOISE MONITORING RESULTS



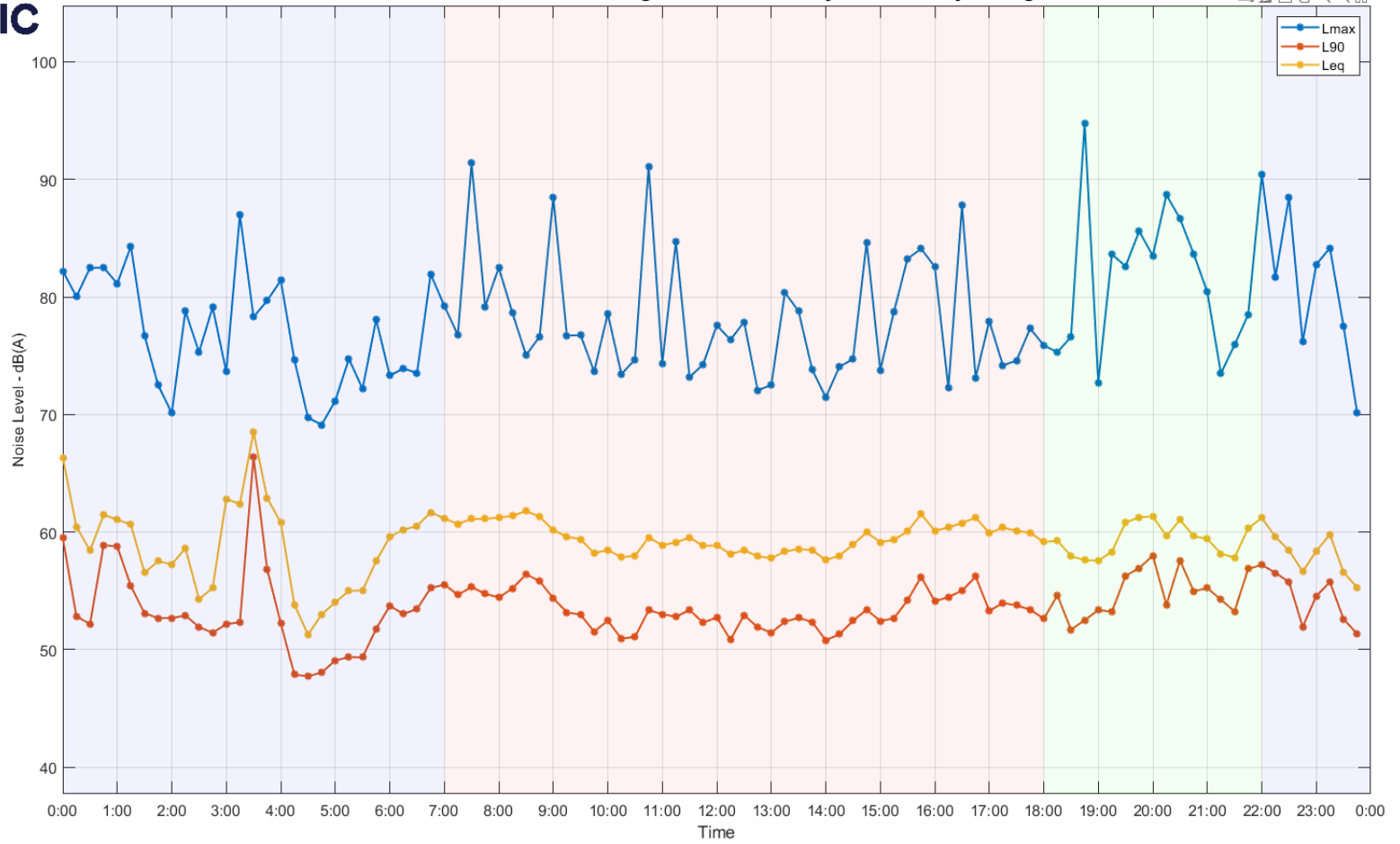
Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Monday 22 August, 2022



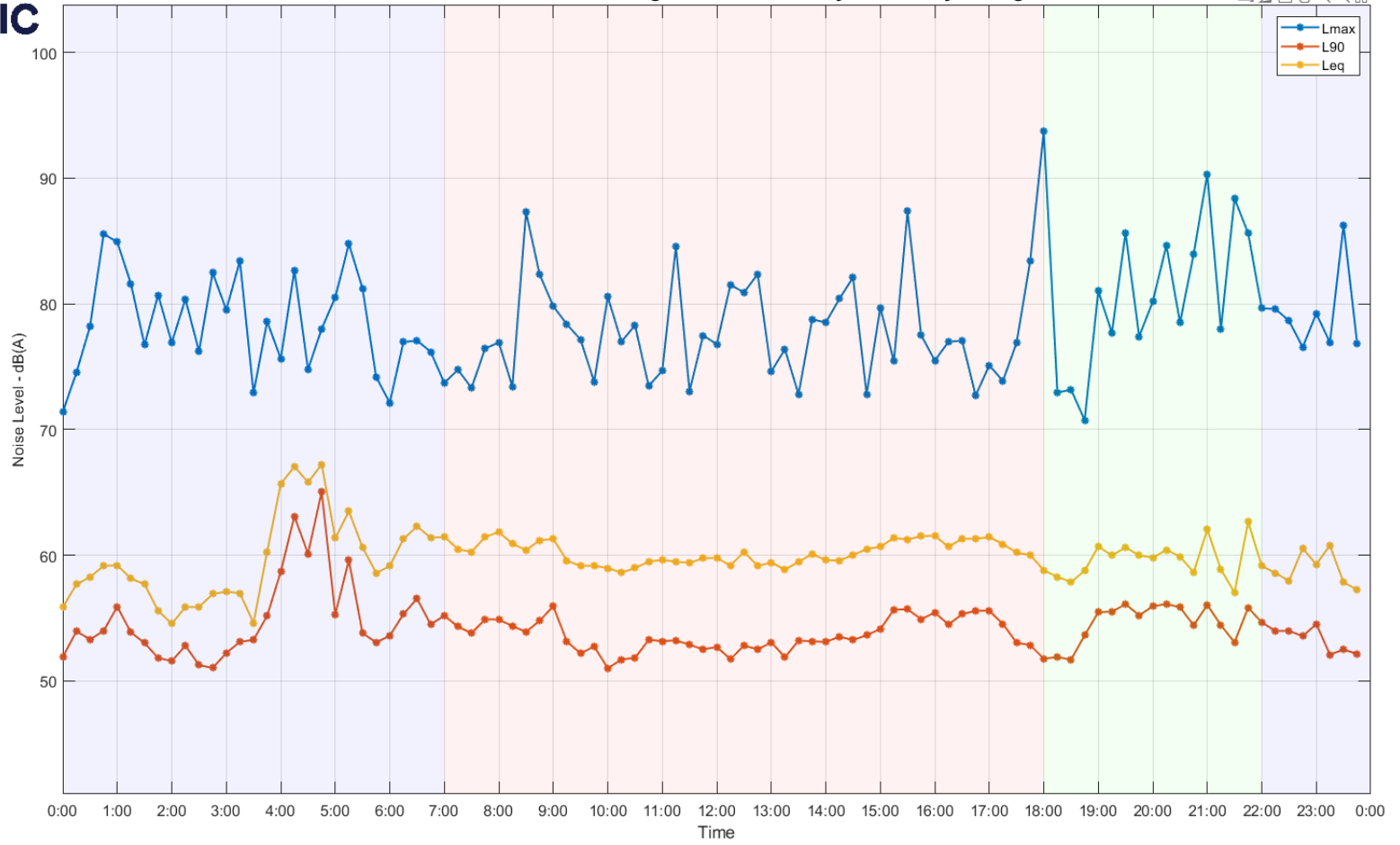
Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Tuesday 23 August, 2022



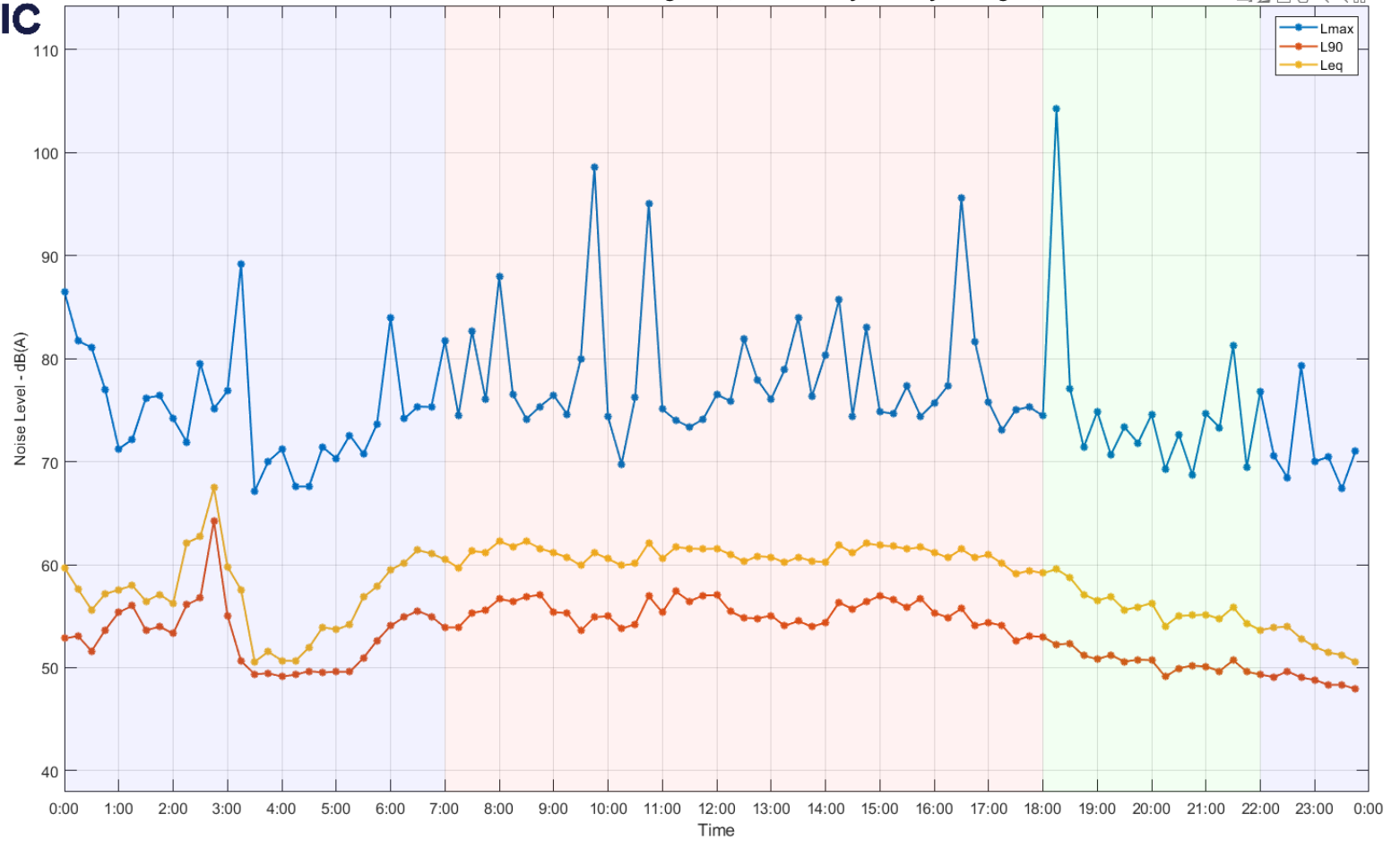
Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Wednesday 24 August, 2022



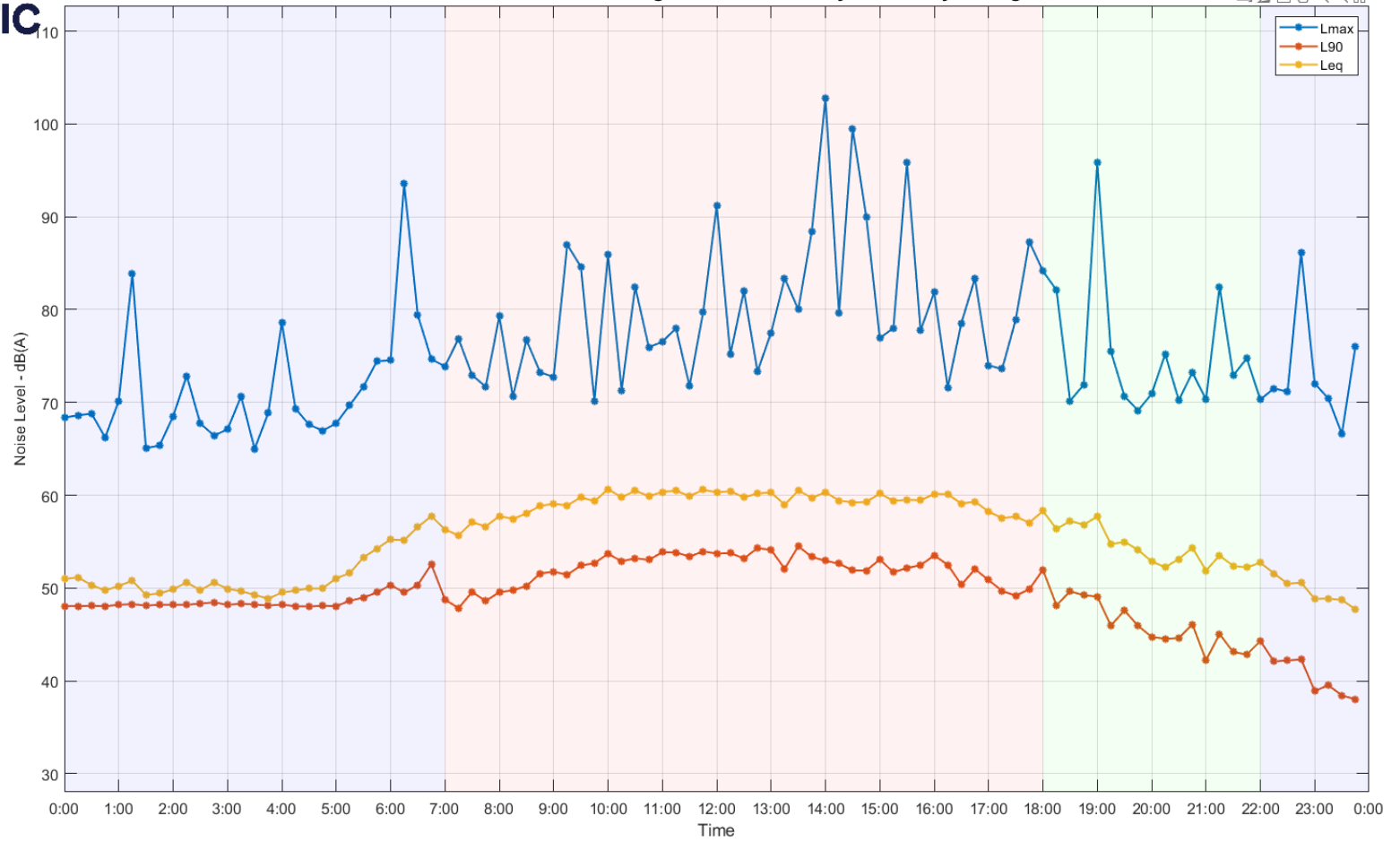
Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Thursday 25 August, 2022



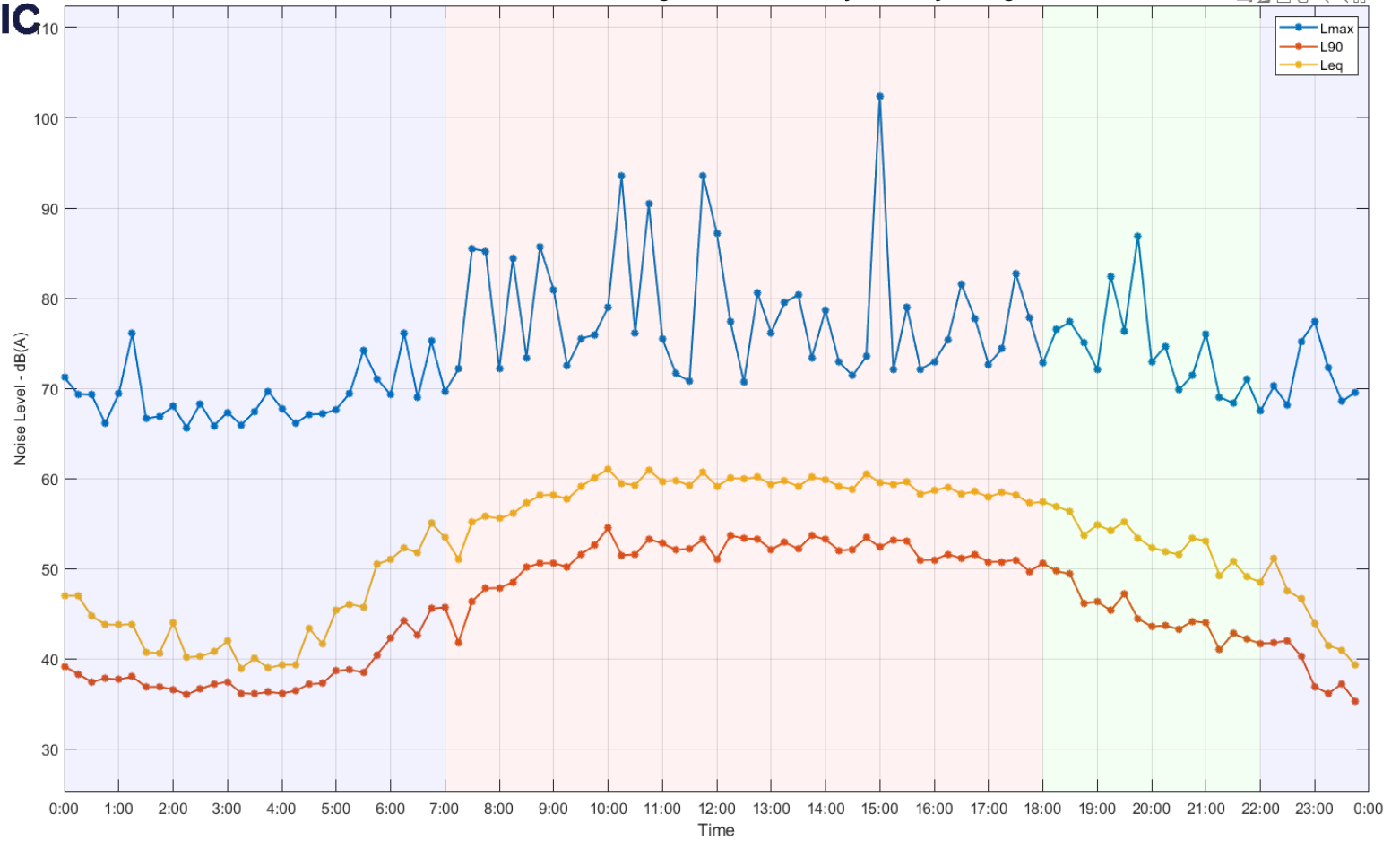
Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Friday 26 August, 2022



Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Saturday 27 August, 2022

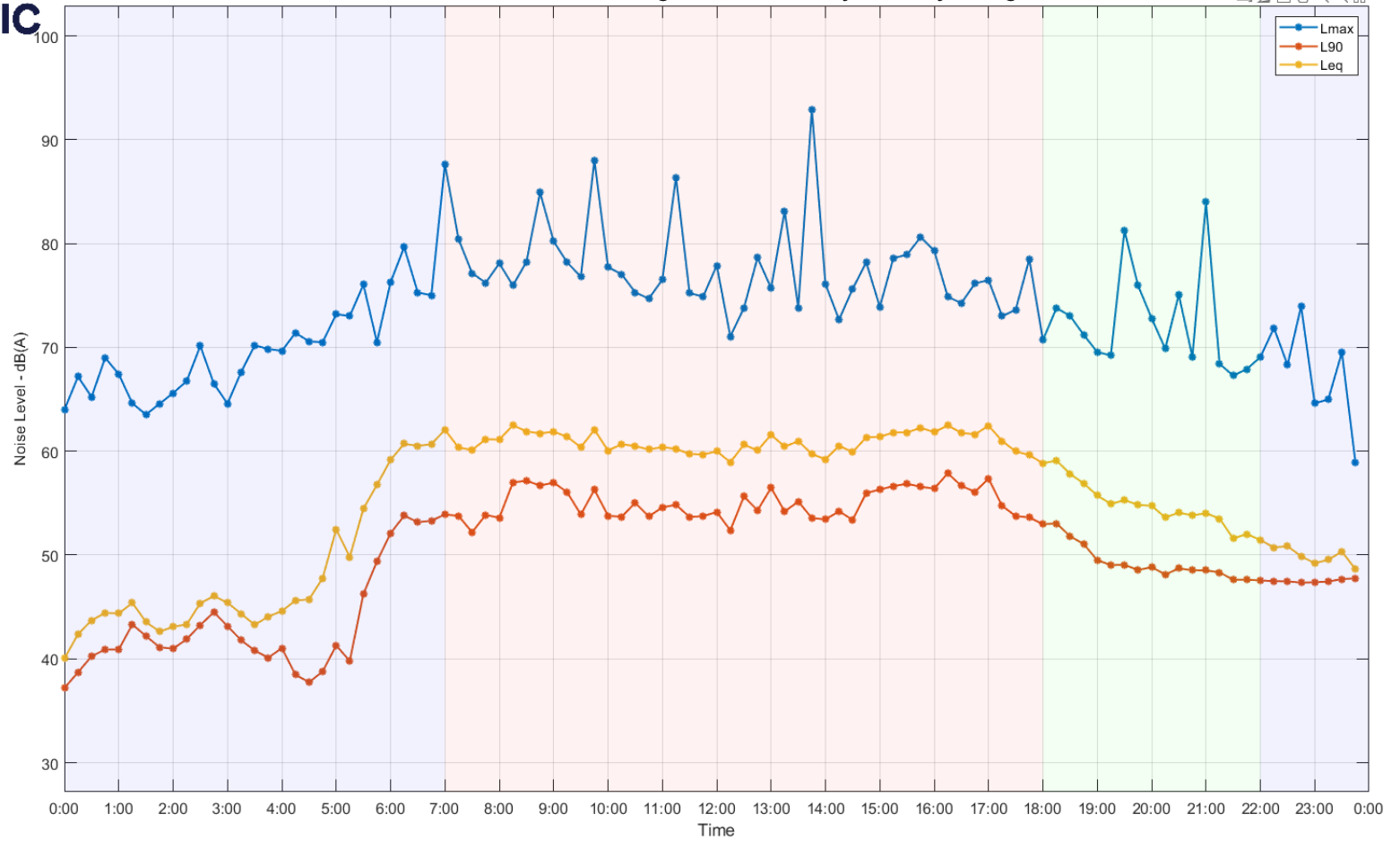


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Sunday 28 August, 2022



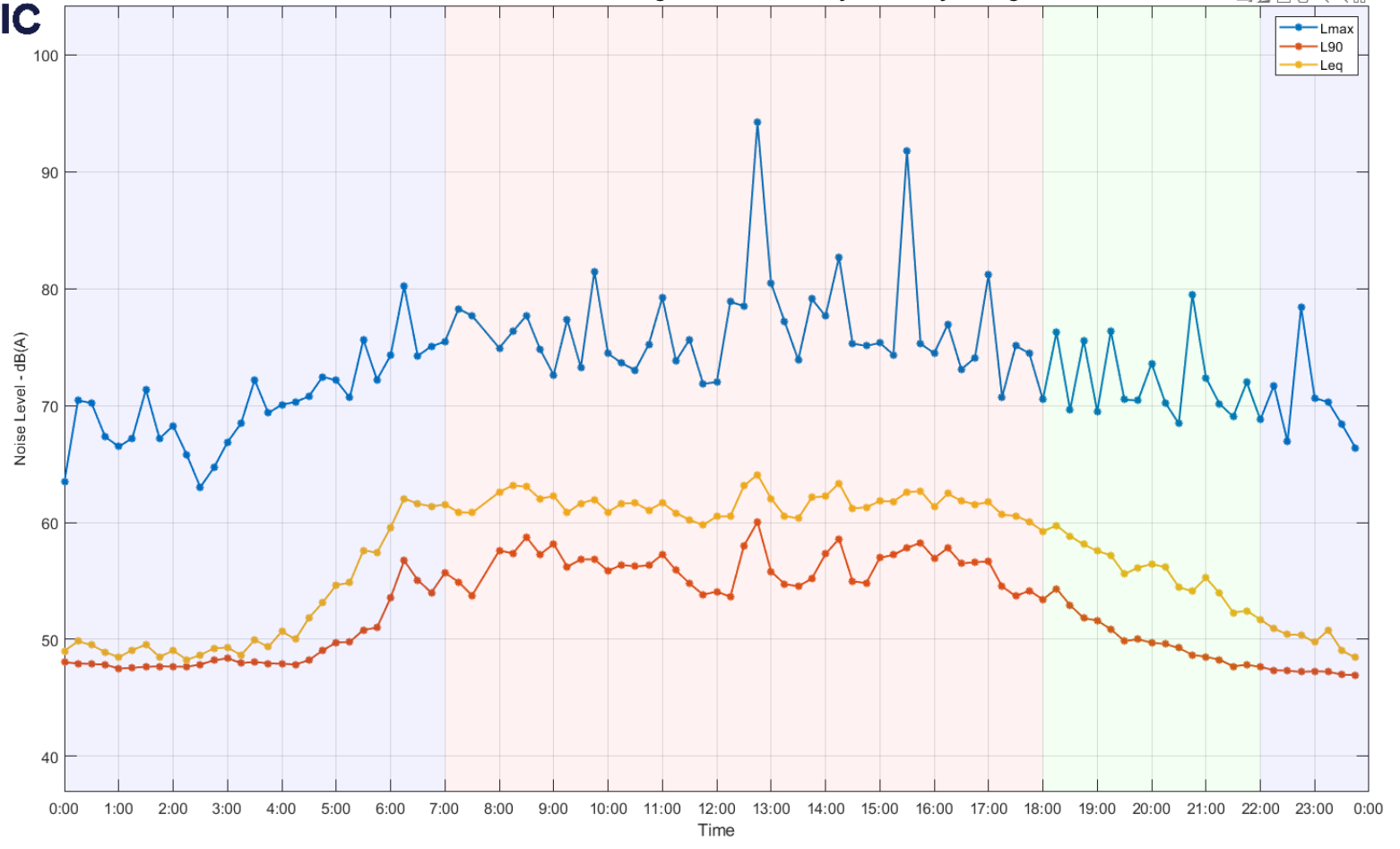


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Monday 29 August, 2022



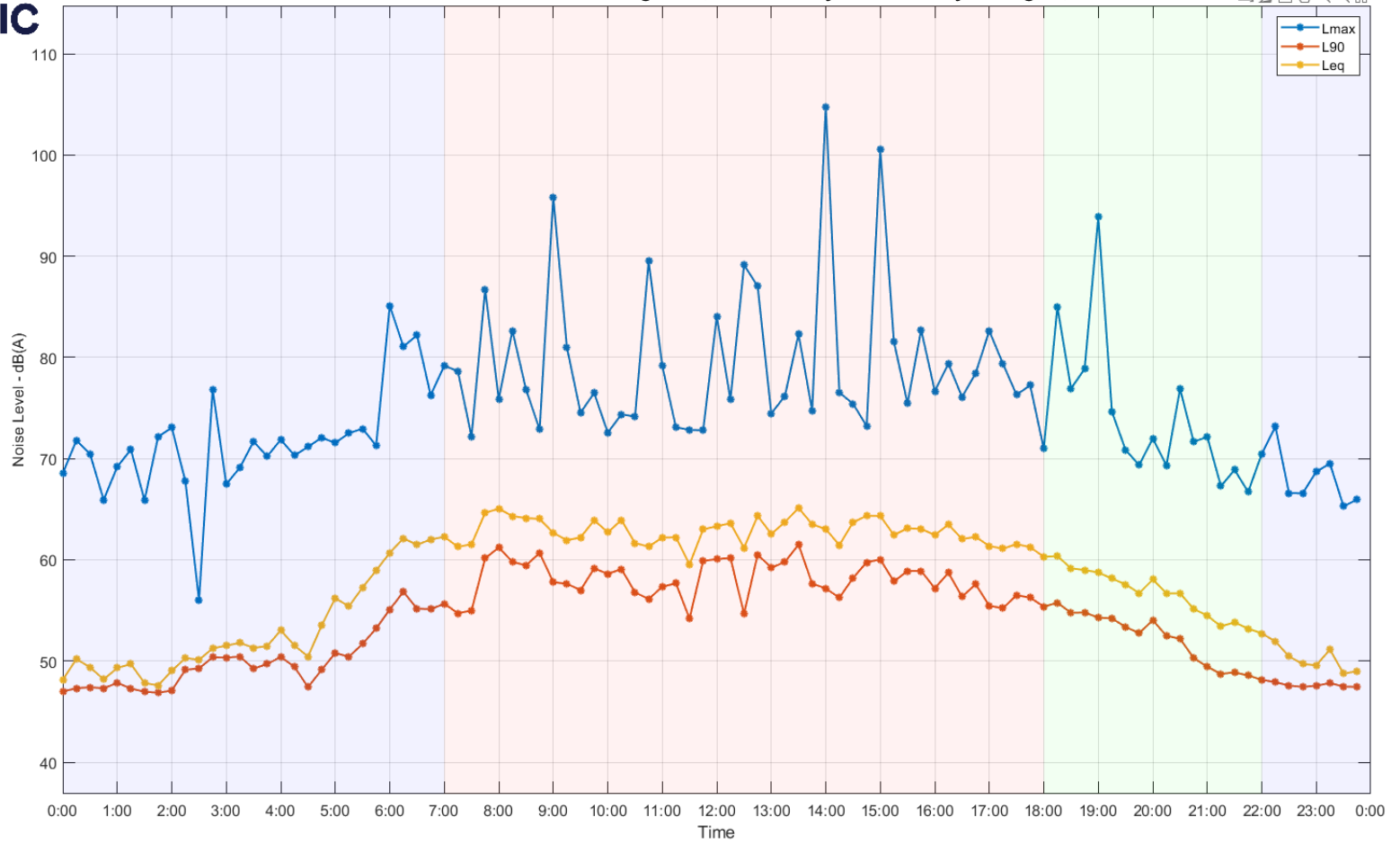


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Tuesday 30 August, 2022



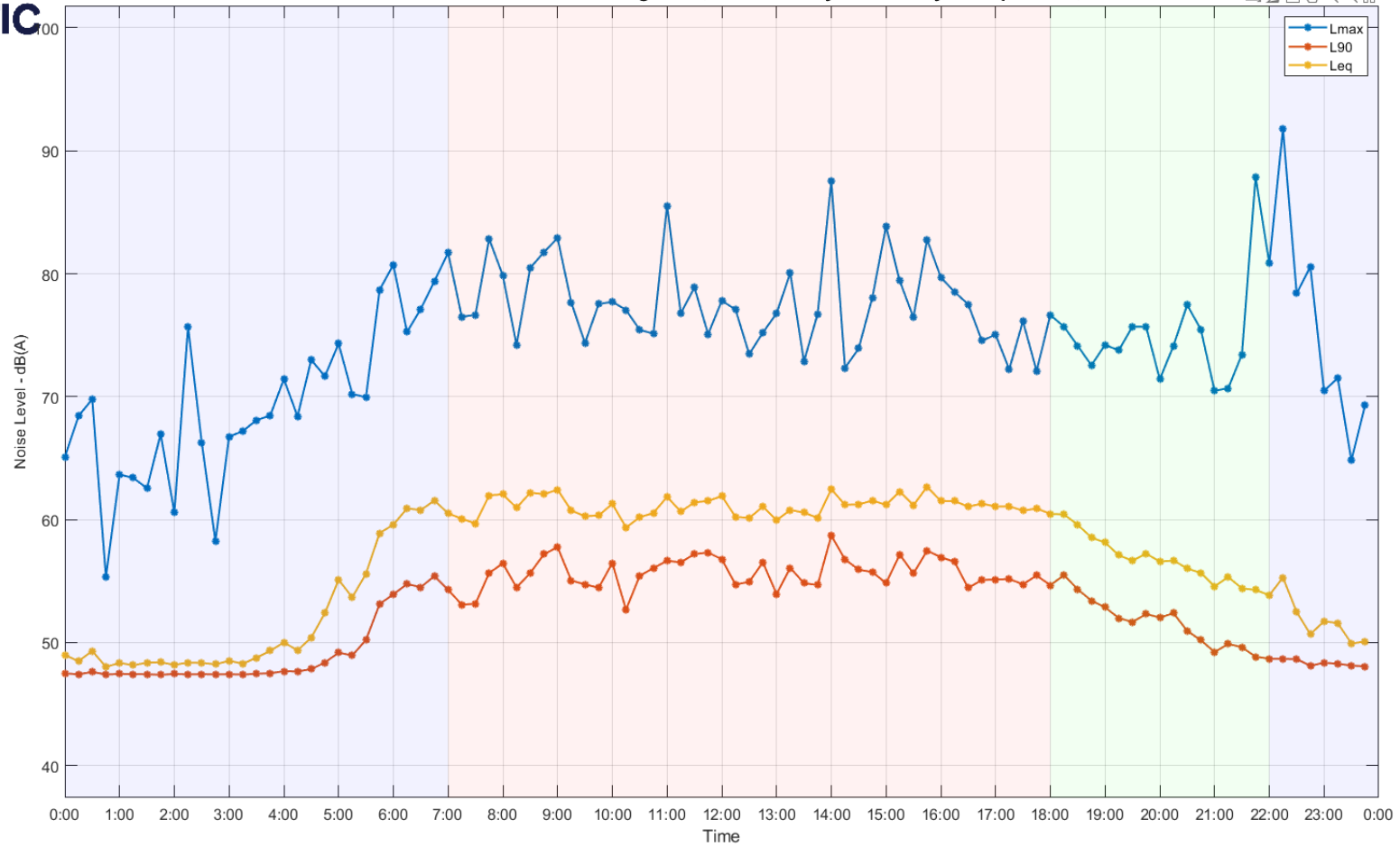


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Wednesday 31 August, 2022



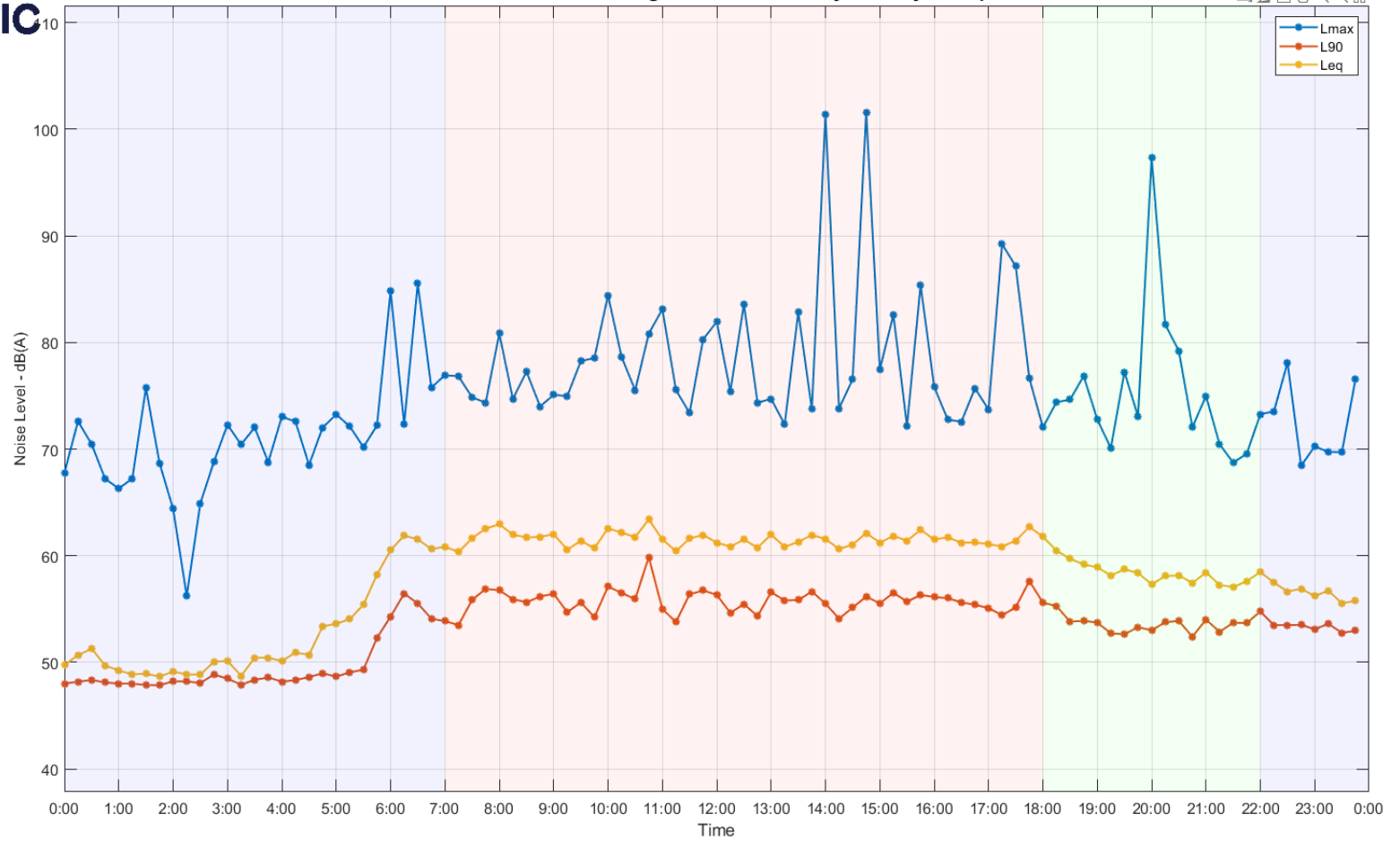


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Thursday 01 September, 2022



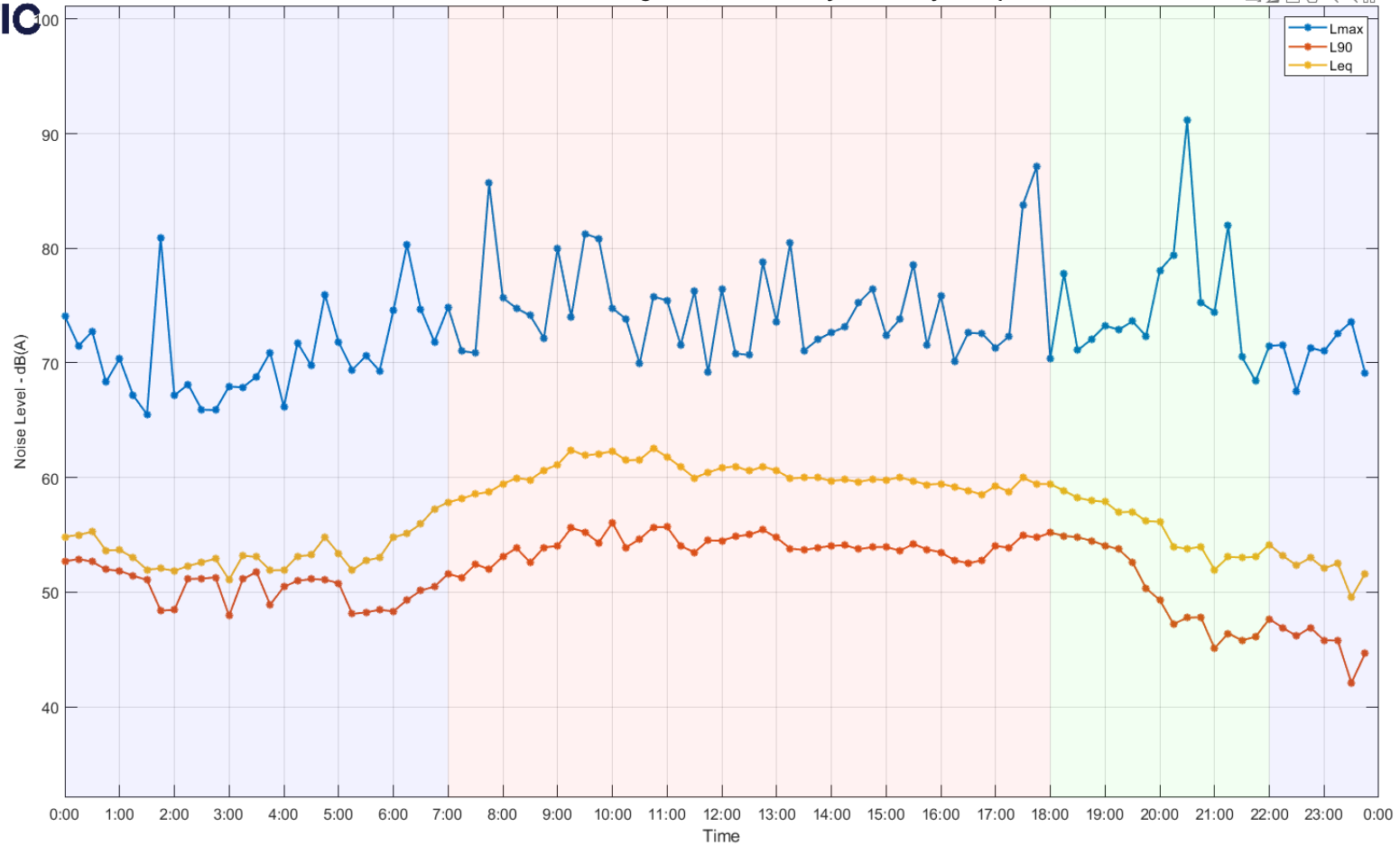


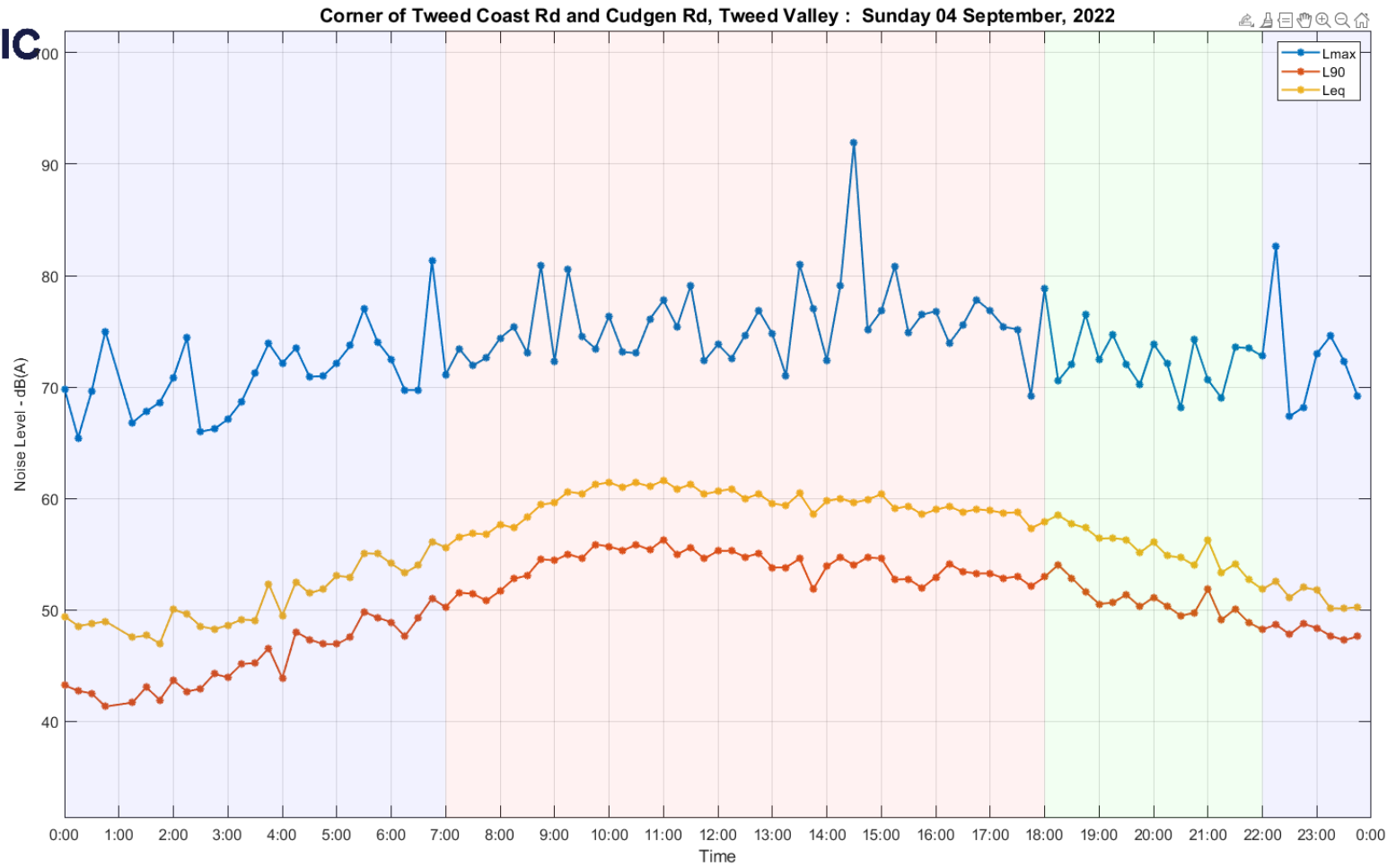
Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Friday 02 September, 2022





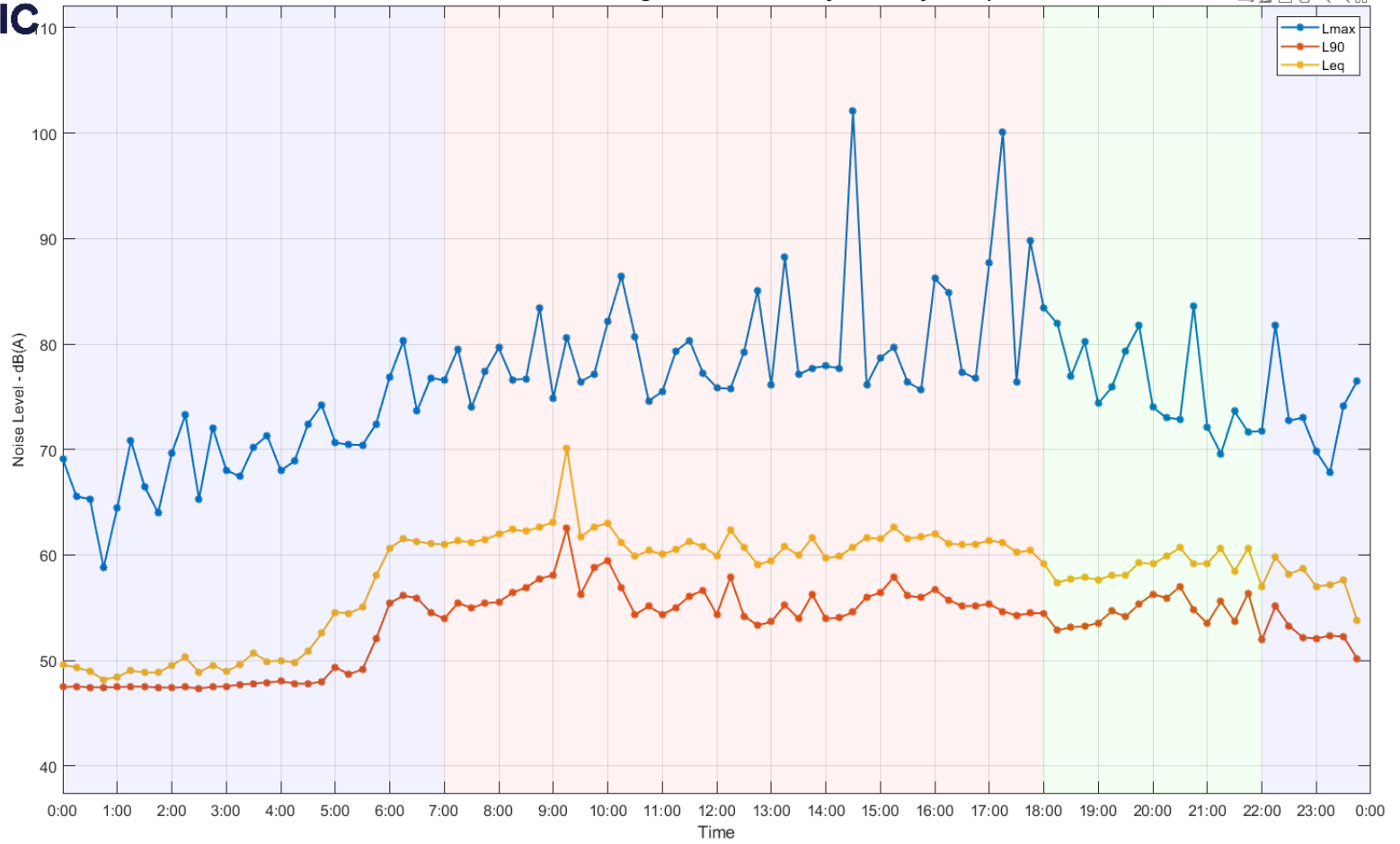
Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Saturday 03 September, 2022





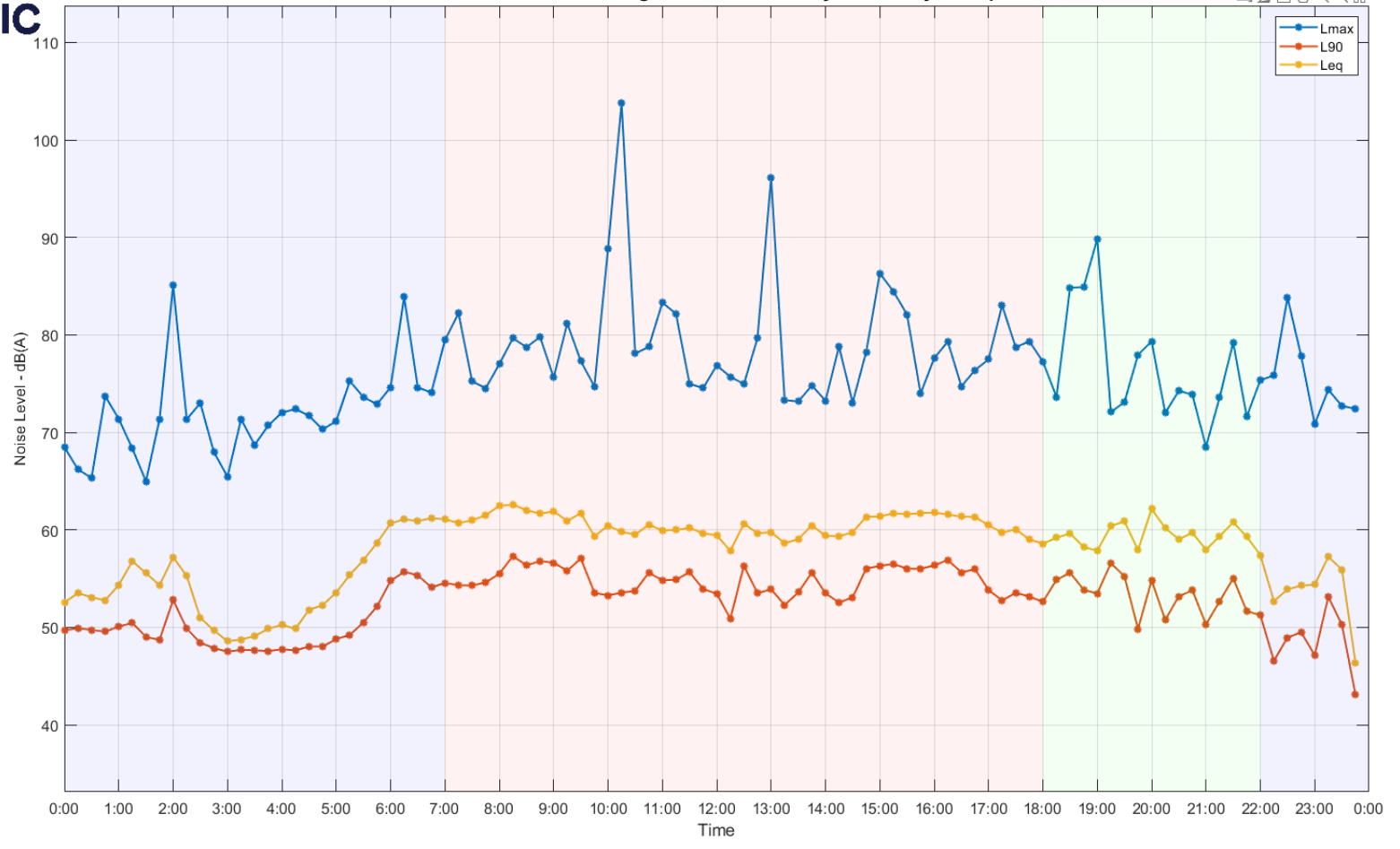


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Monday 05 September, 2022

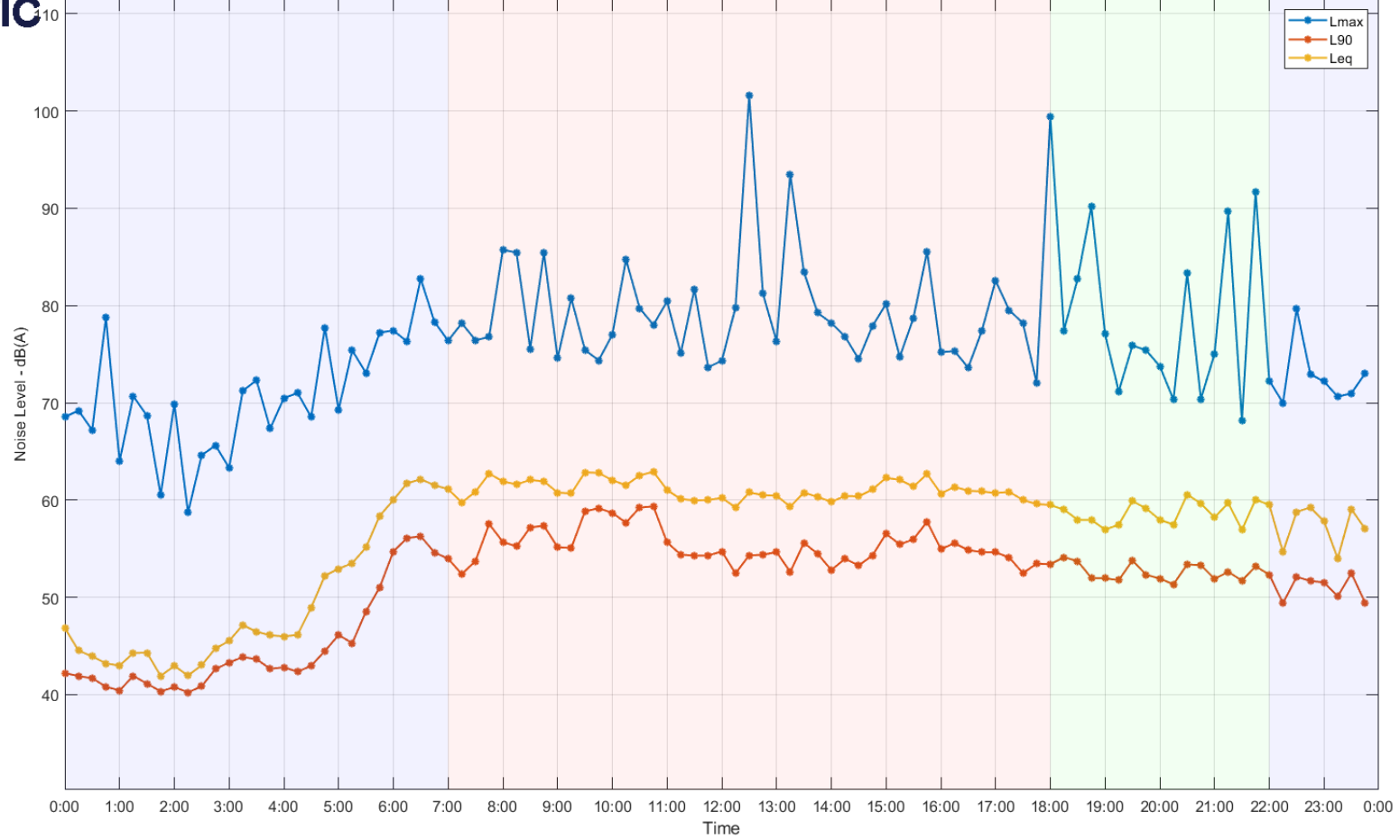




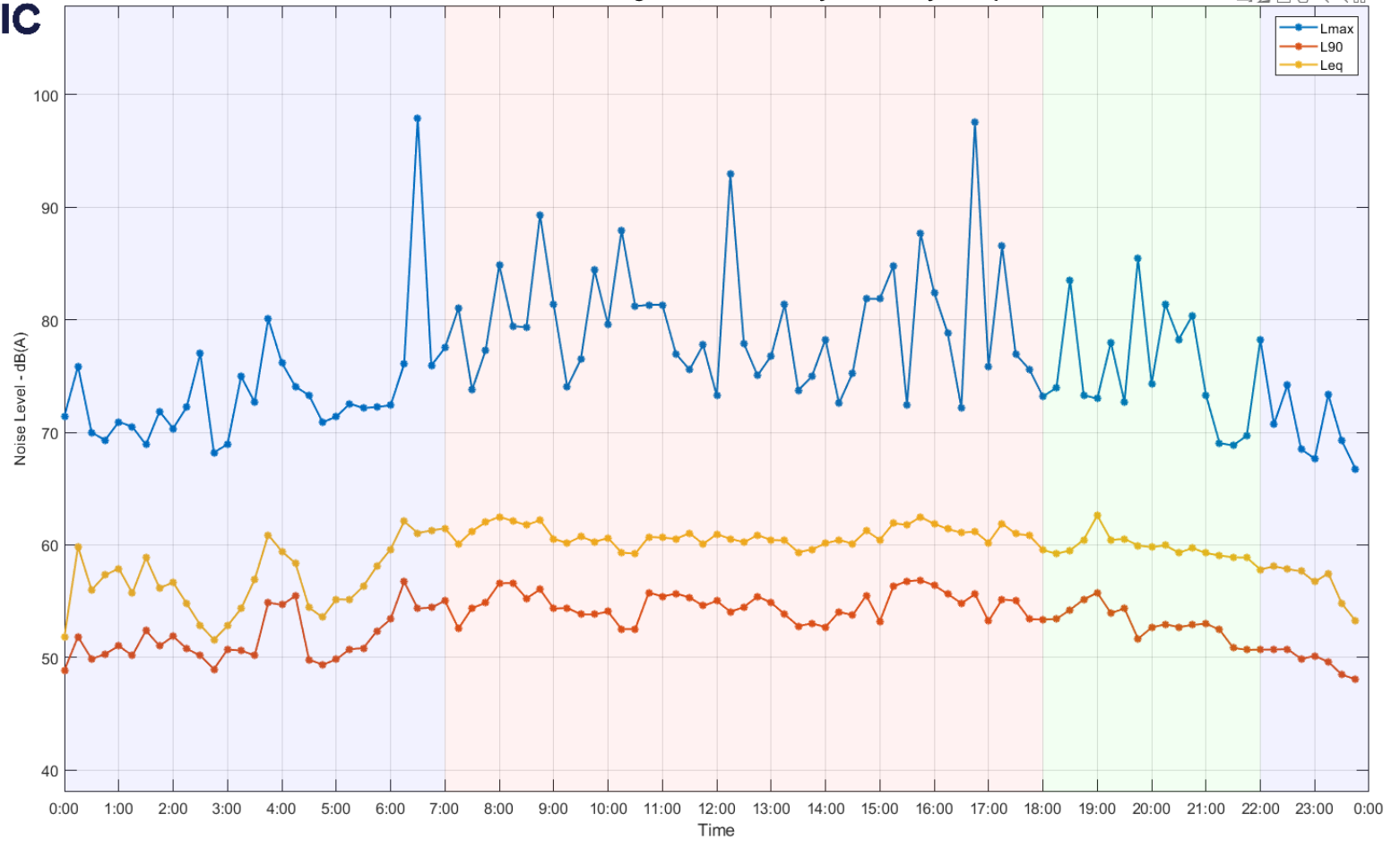
Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Tuesday 06 September, 2022



Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Wednesday 07 September, 2022

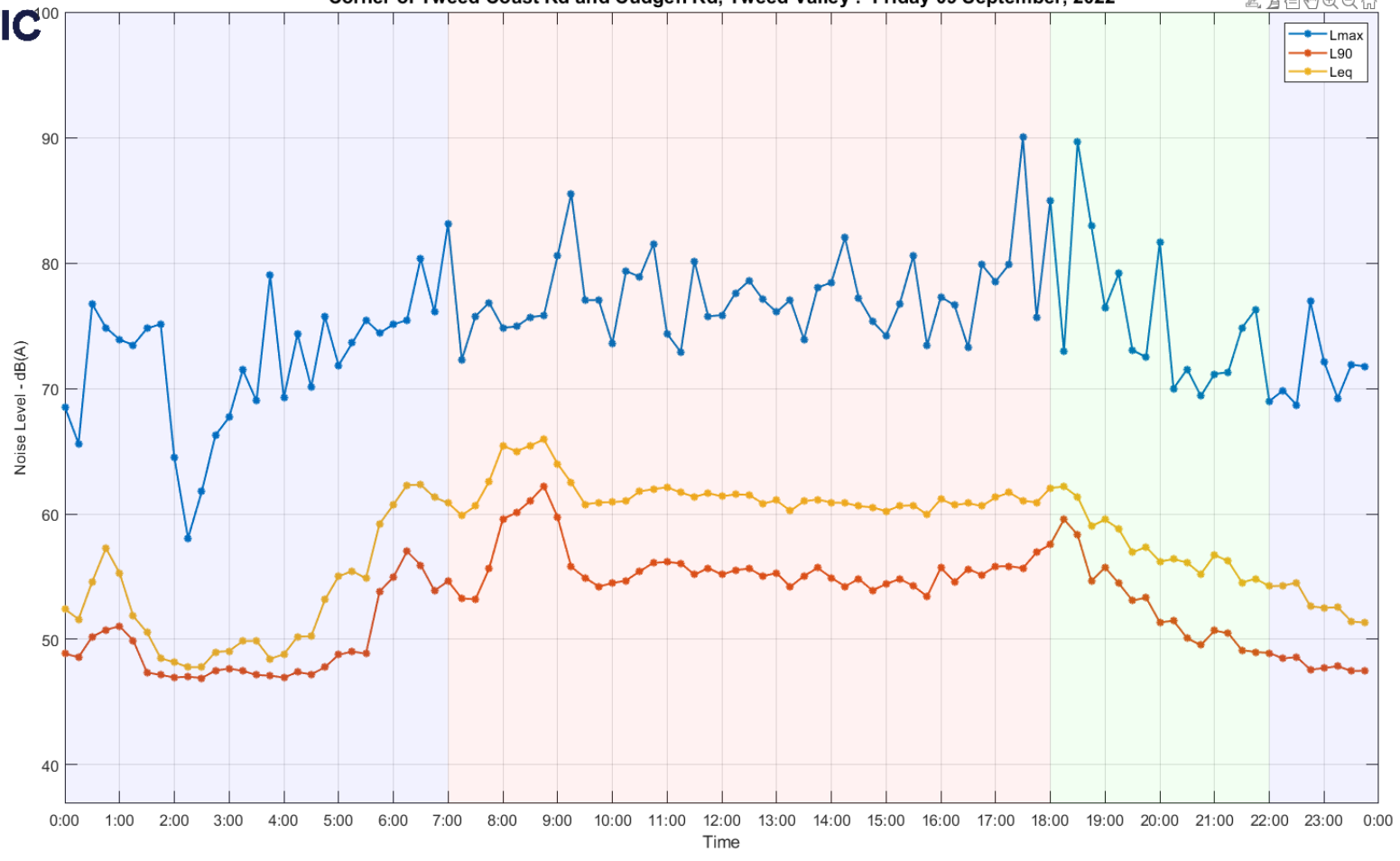


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Thursday 08 September, 2022



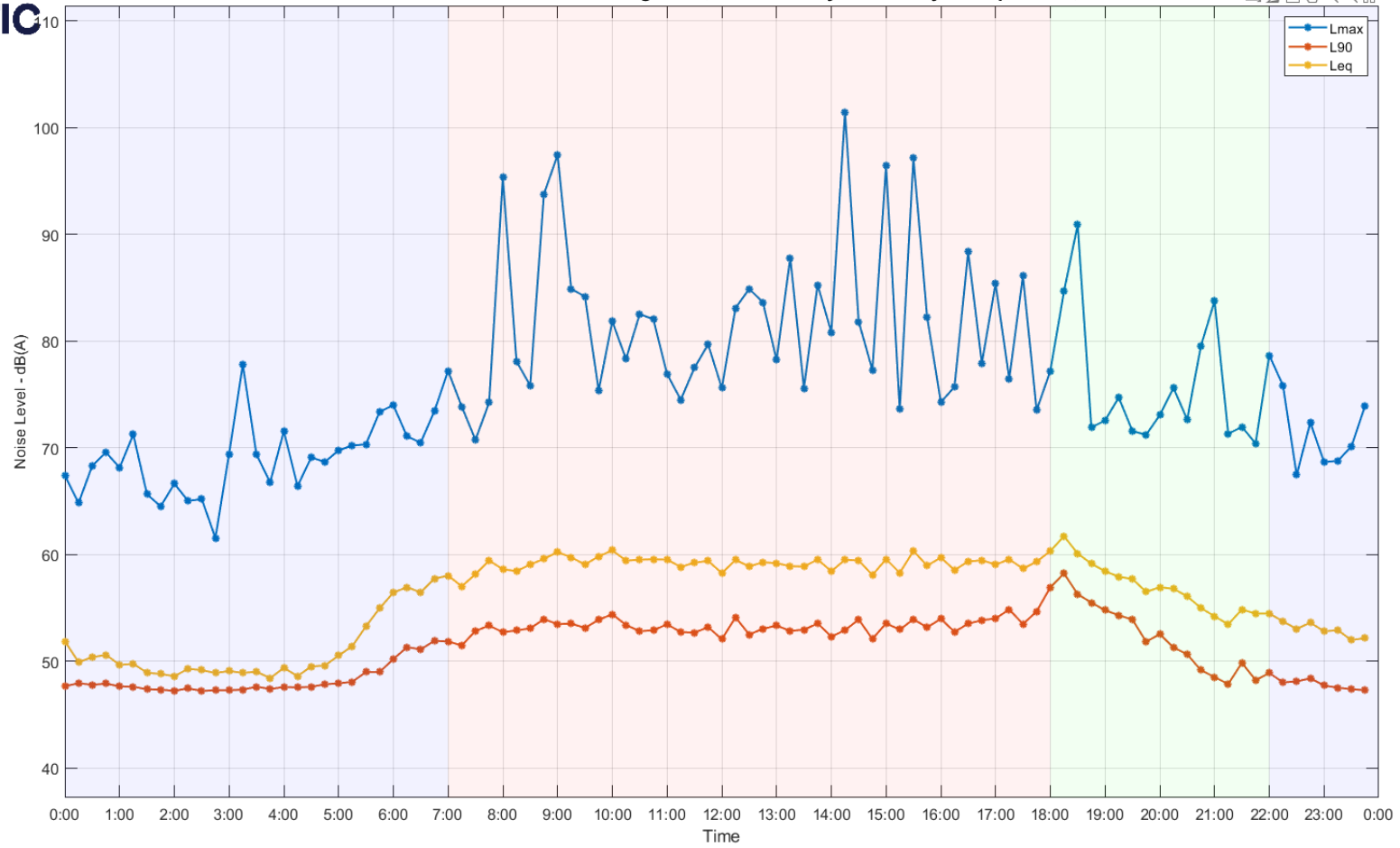


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Friday 09 September, 2022



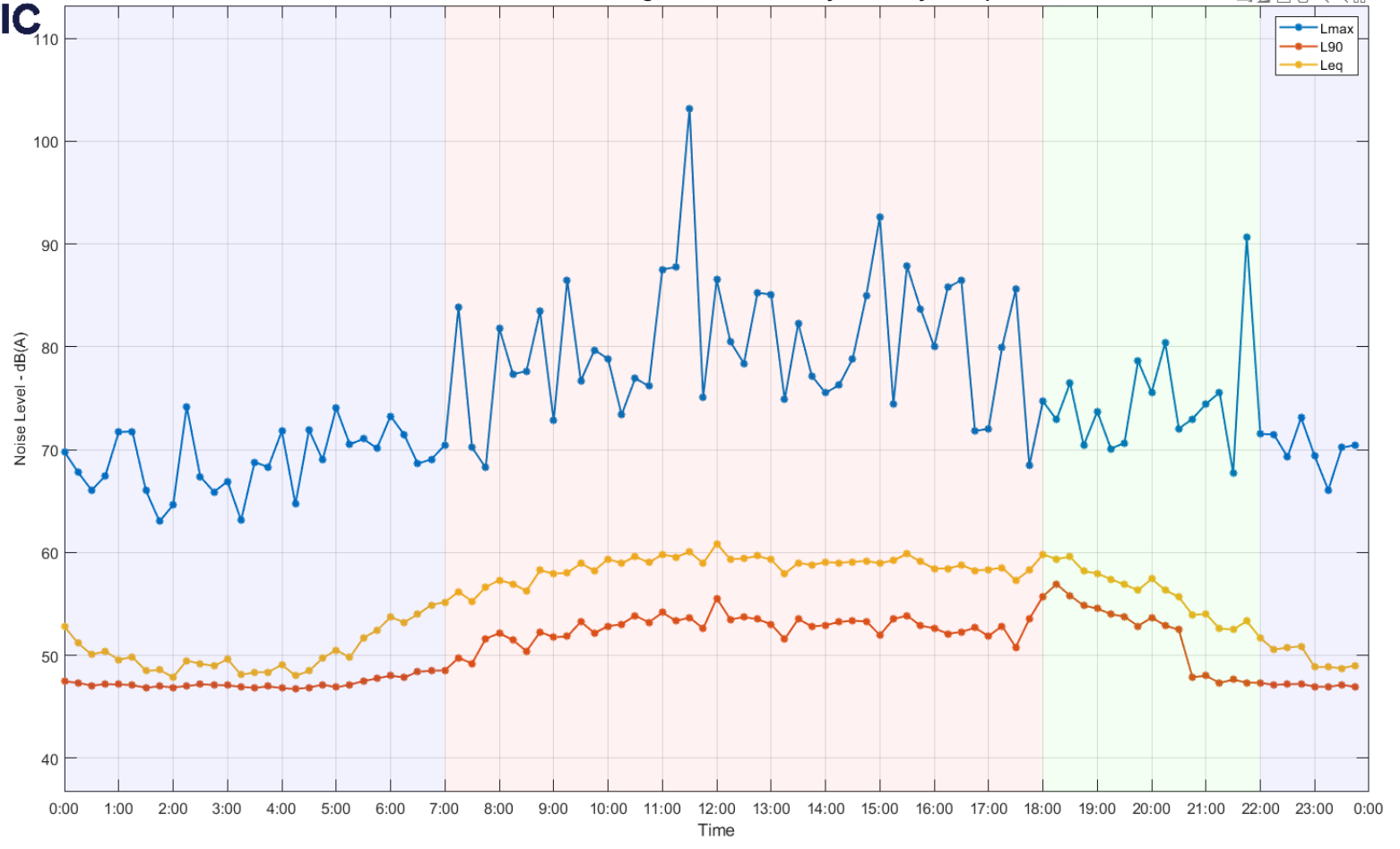


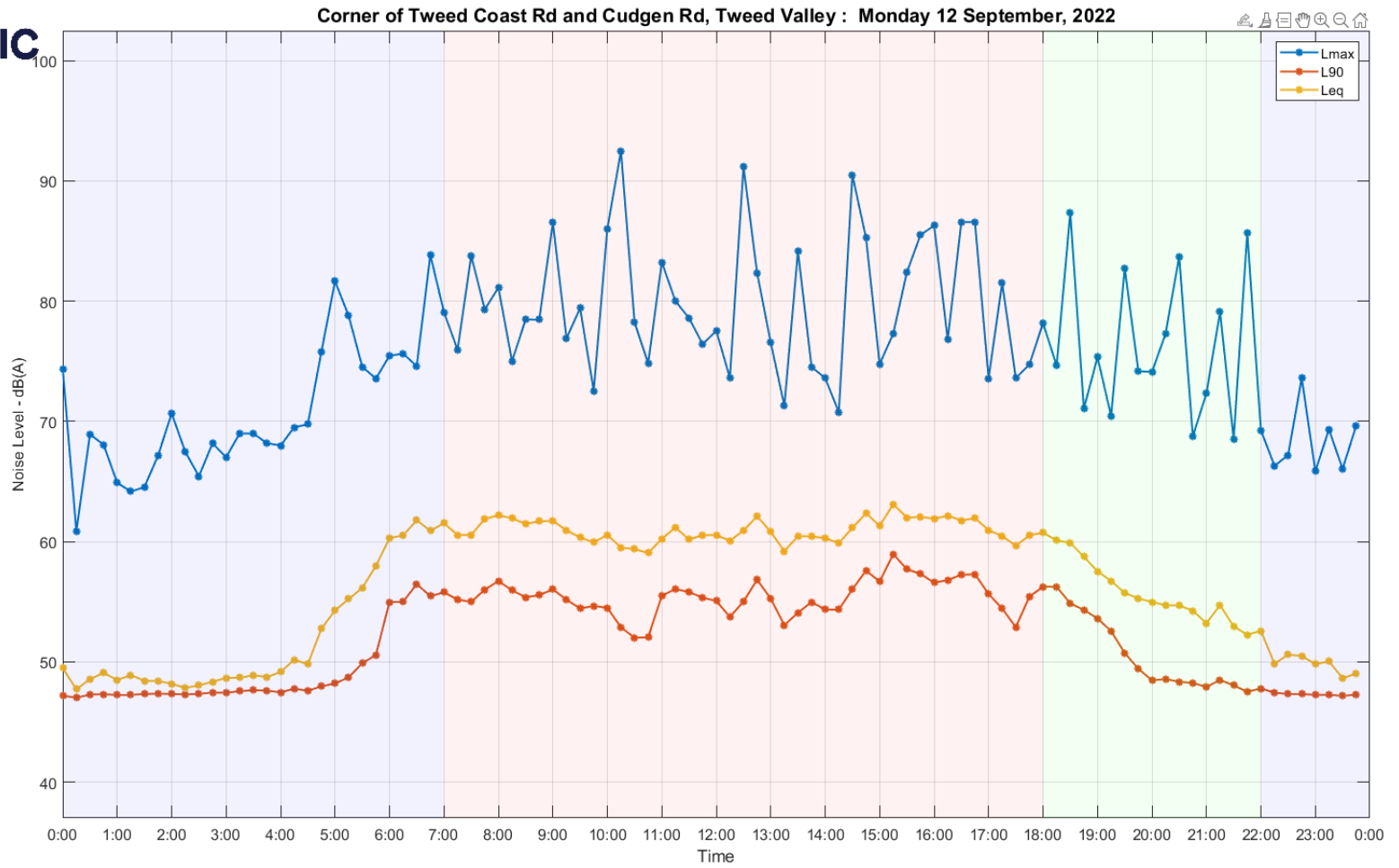
Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Saturday 10 September, 2022





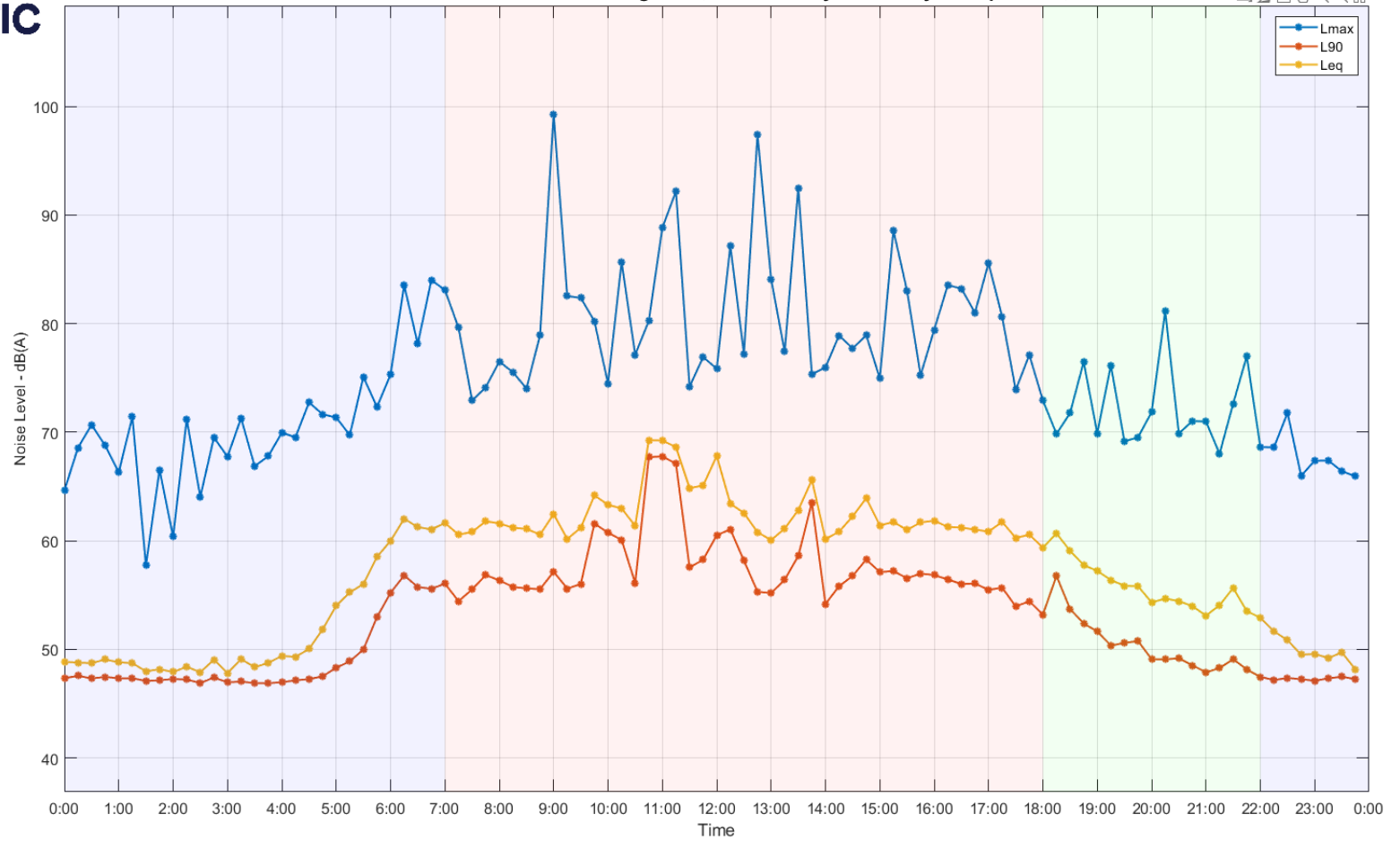
Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Sunday 11 September, 2022





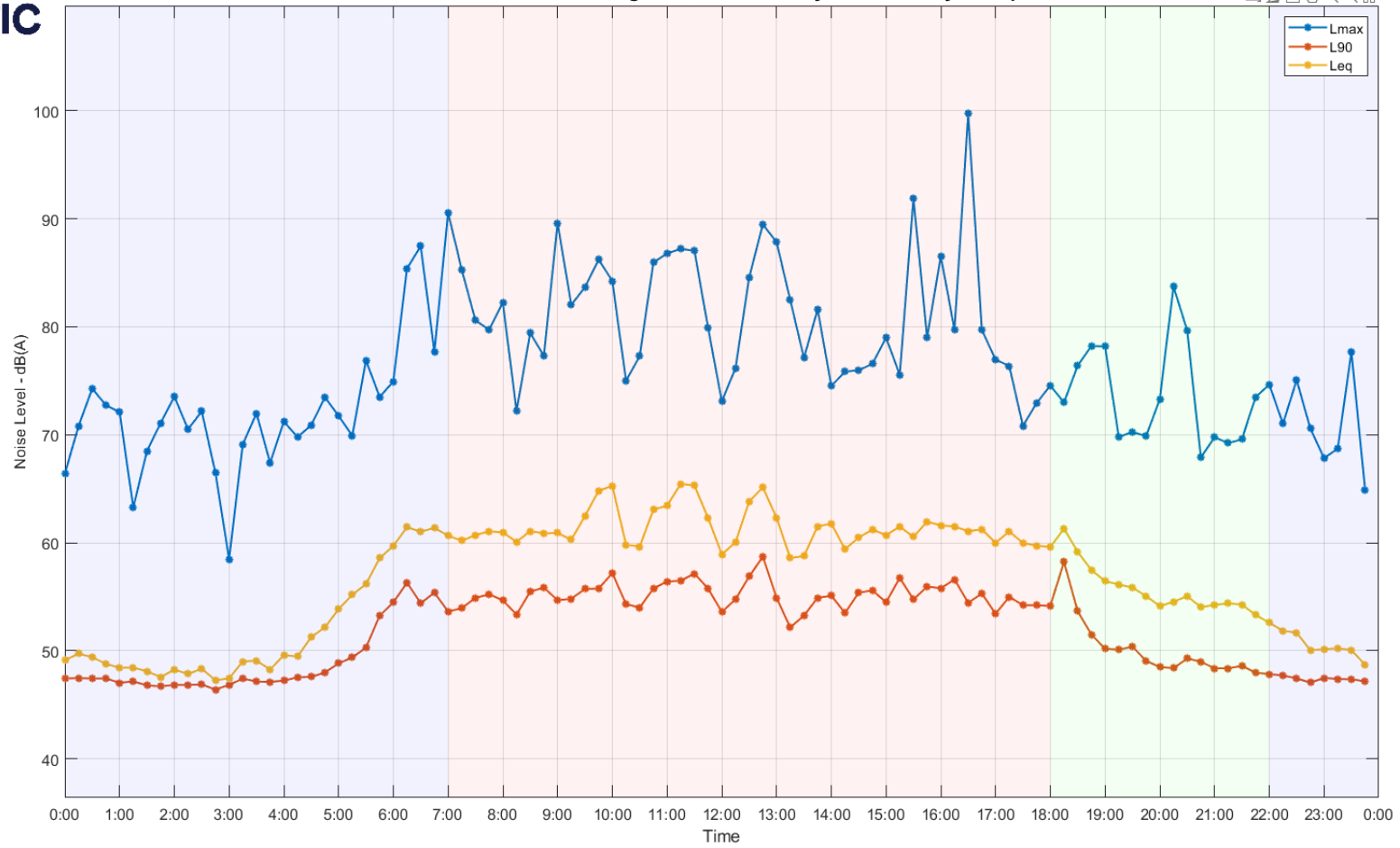


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Tuesday 13 September, 2022

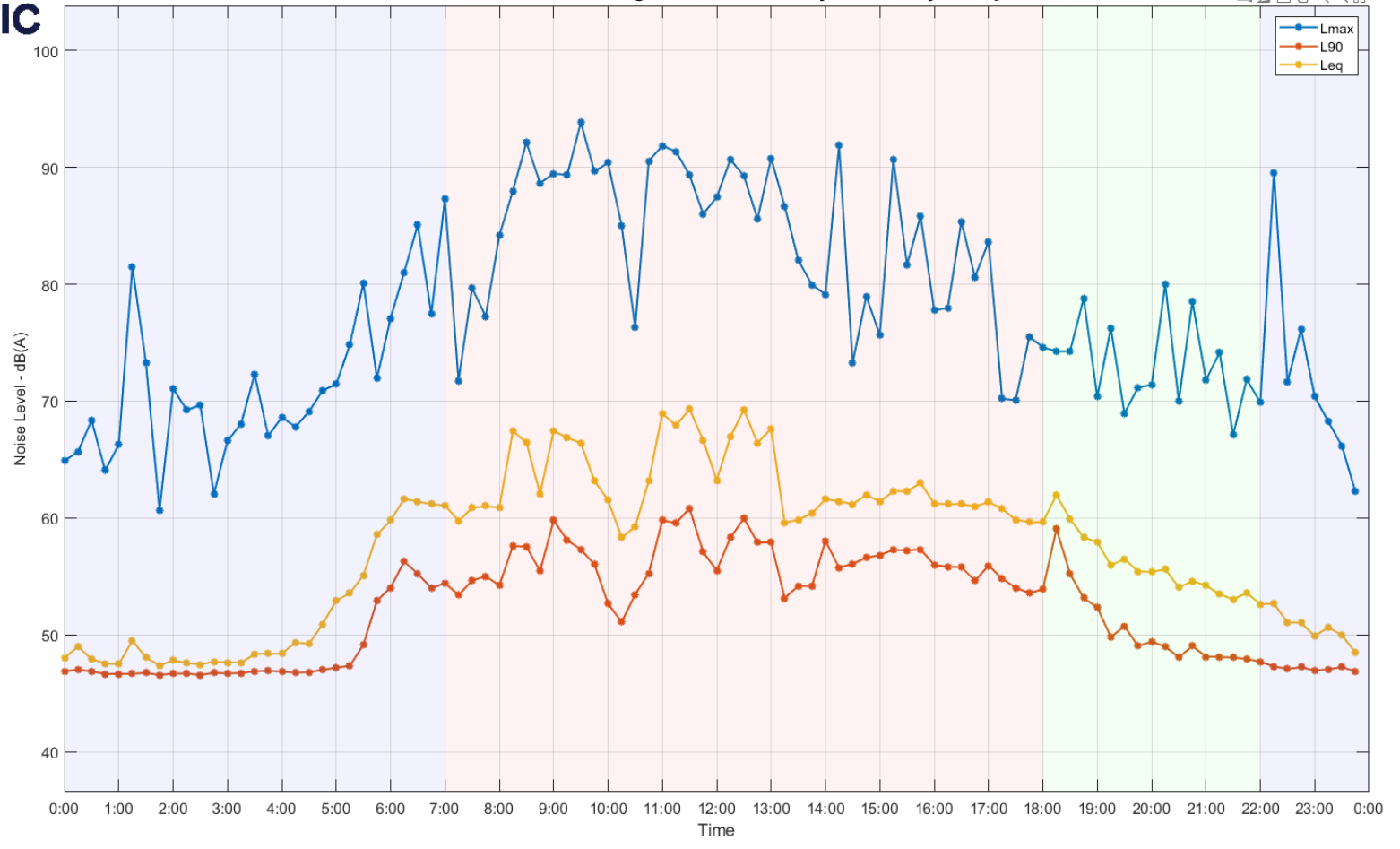




Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Wednesday 14 September, 2022

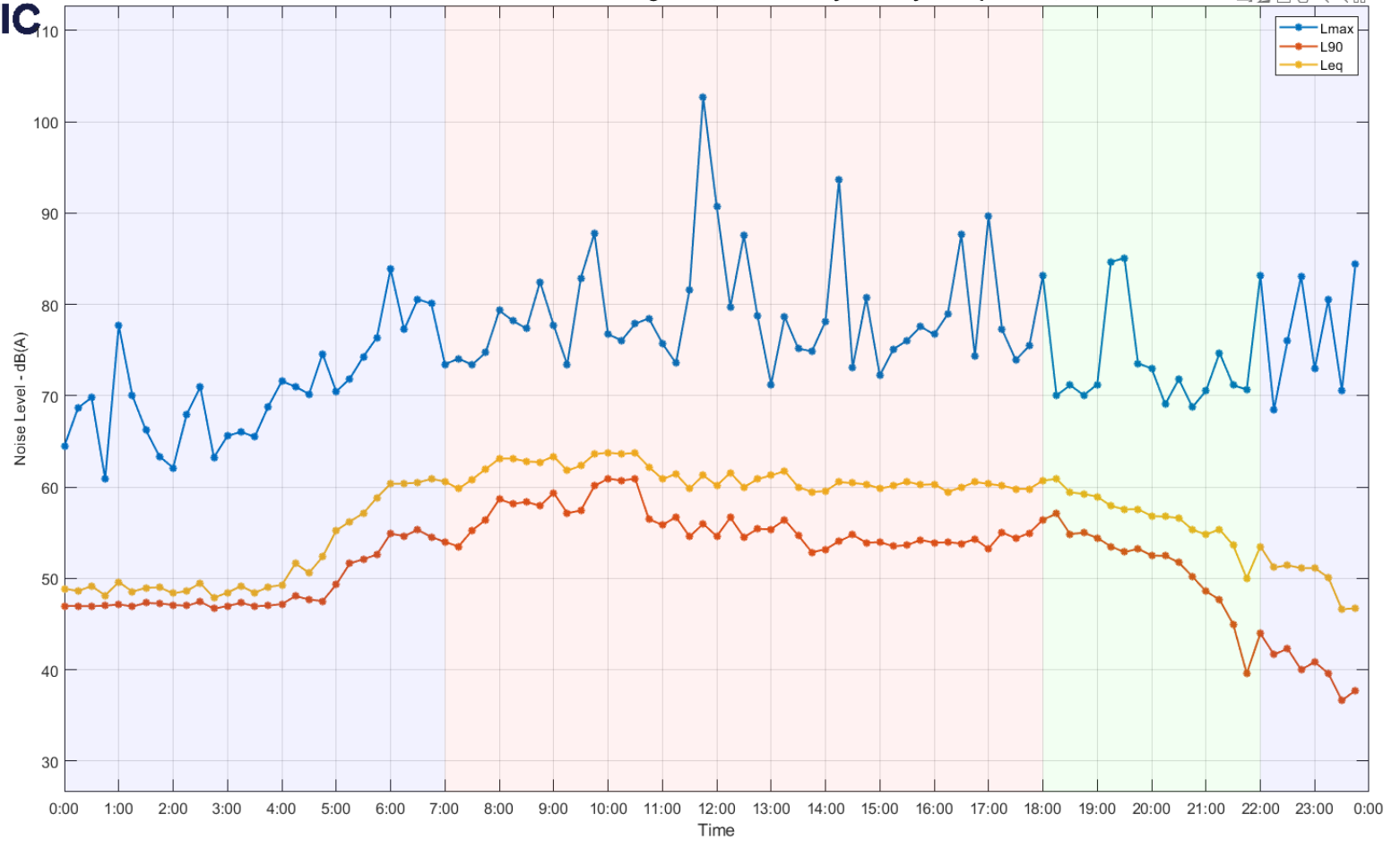


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Thursday 15 September, 2022



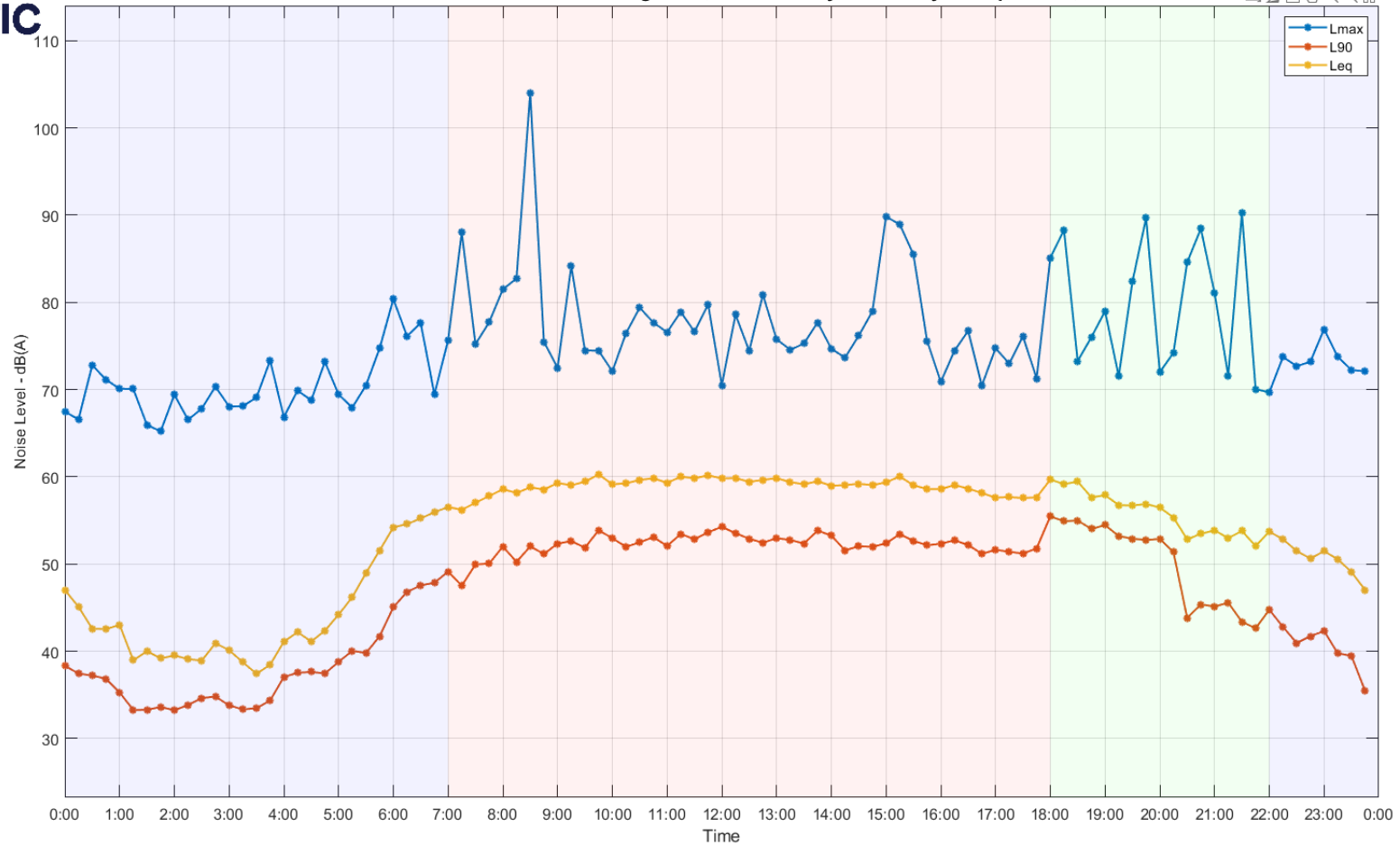


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Friday 16 September, 2022



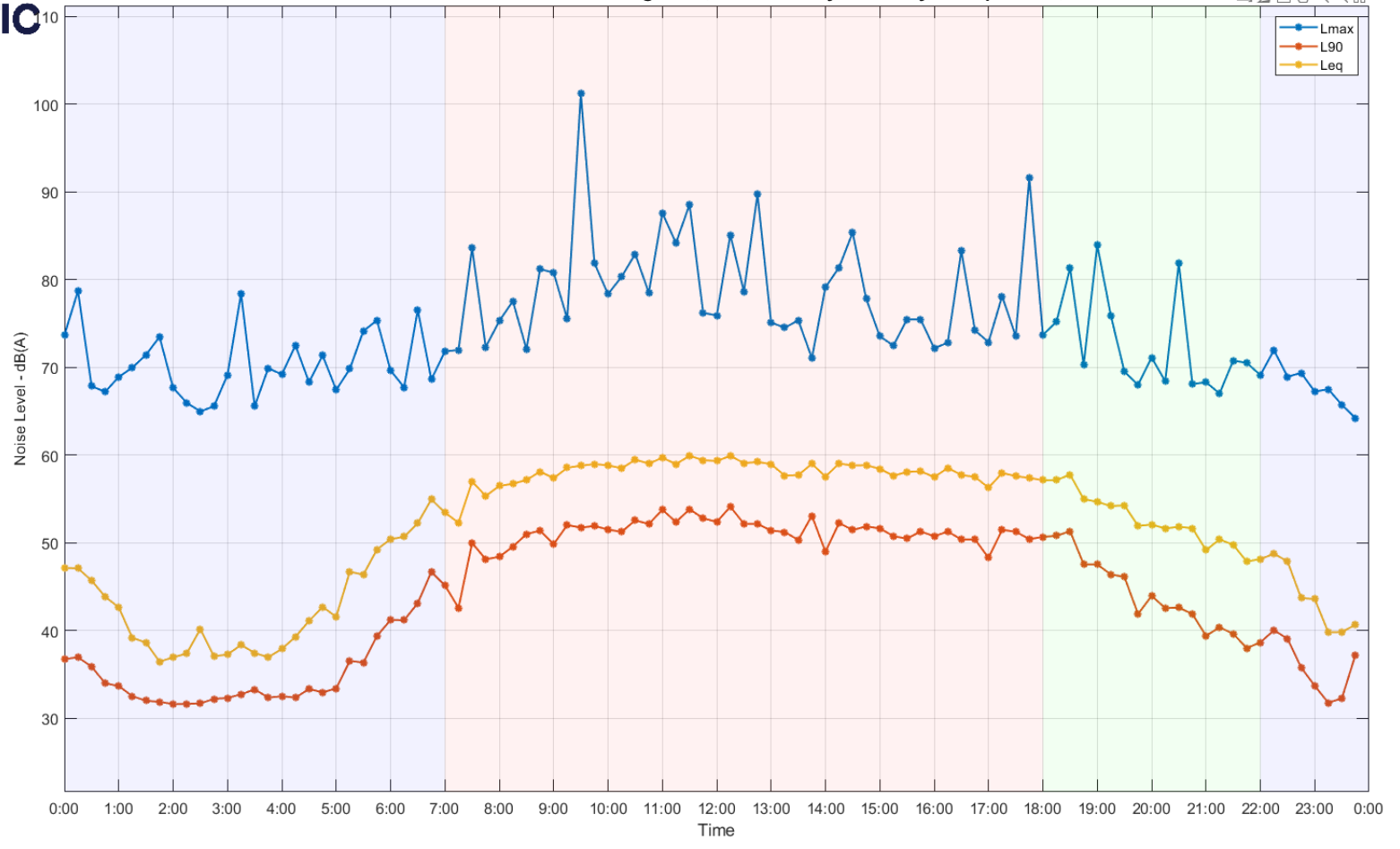


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Saturday 17 September, 2022

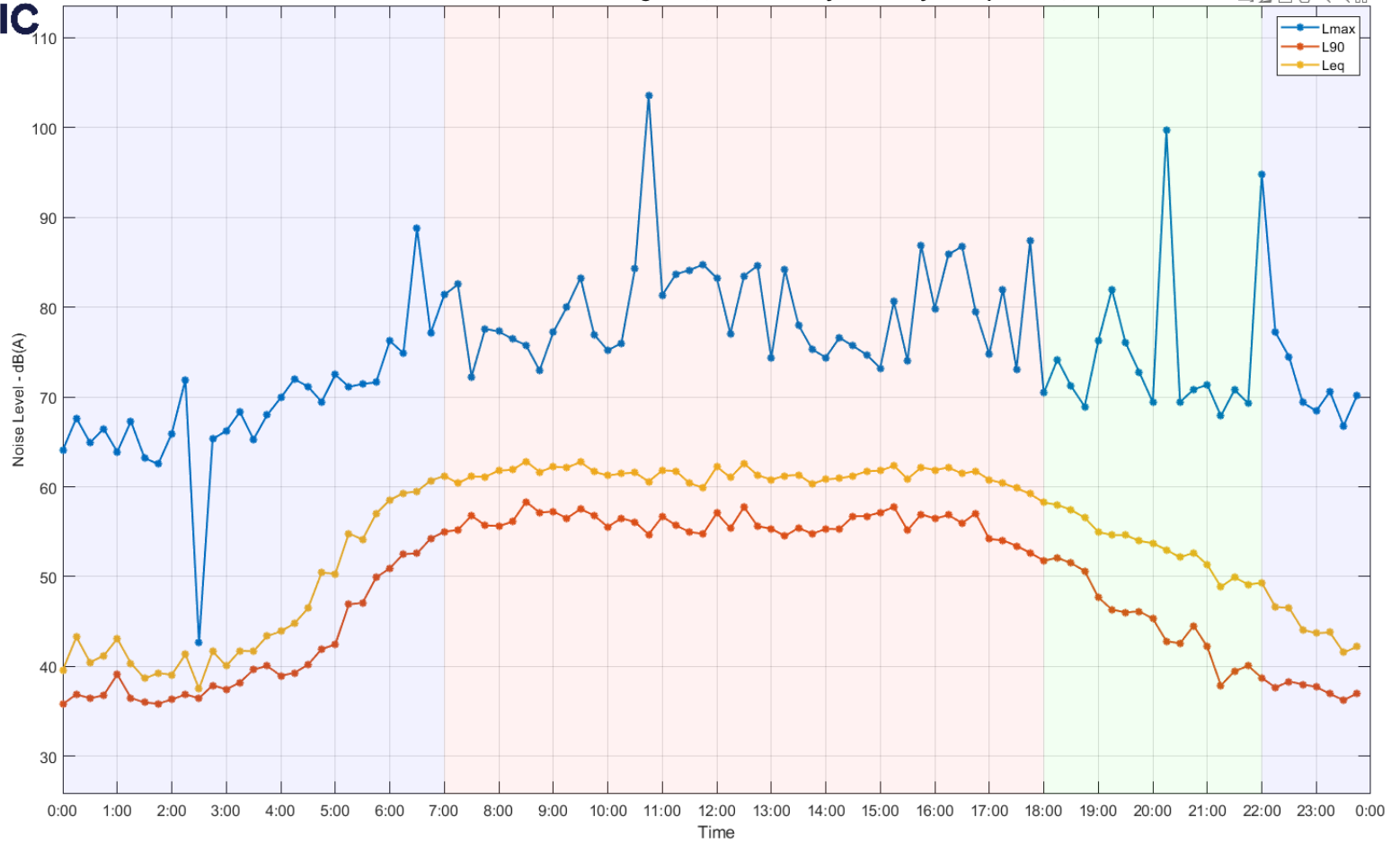




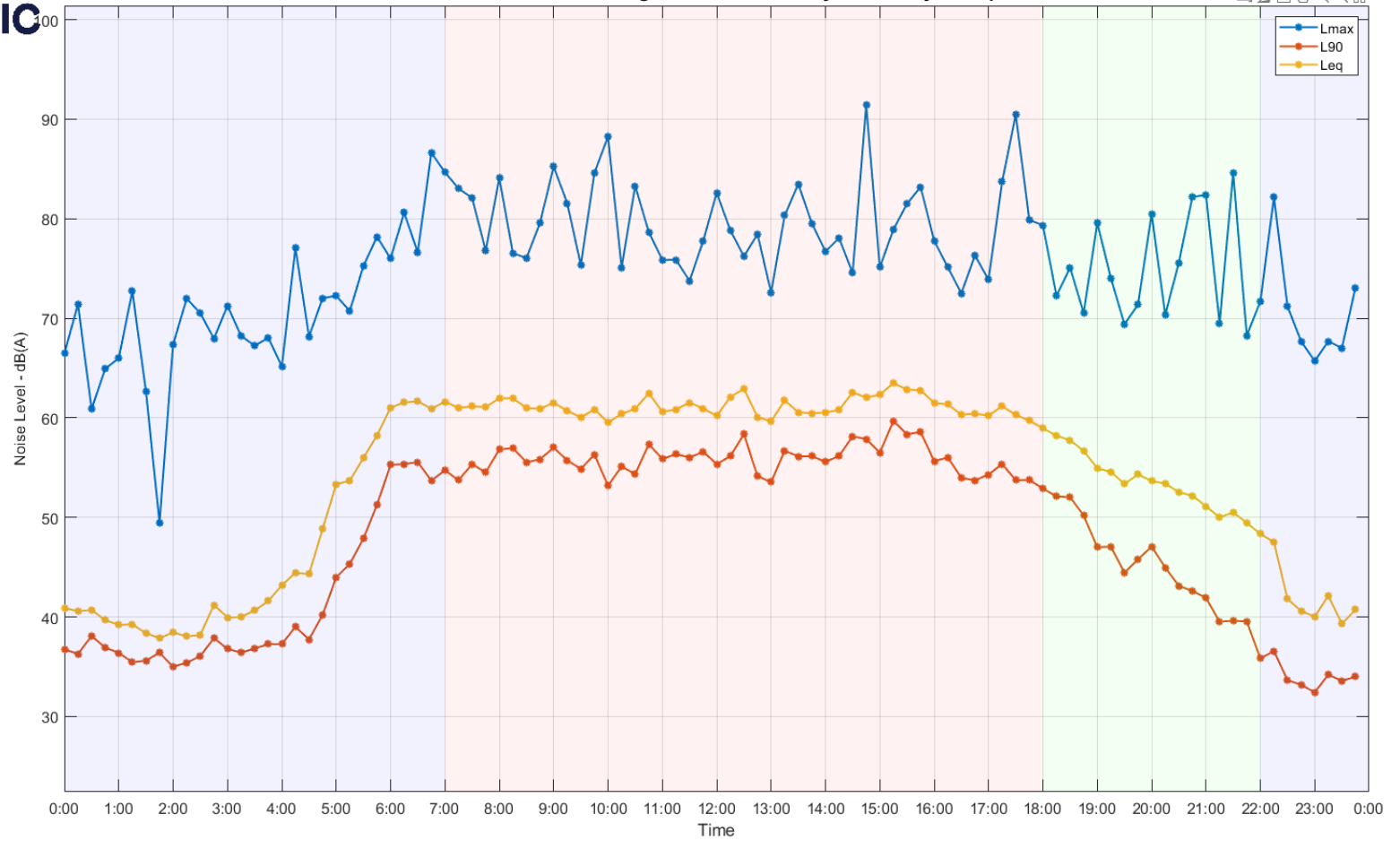
Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Sunday 18 September, 2022



Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Monday 19 September, 2022

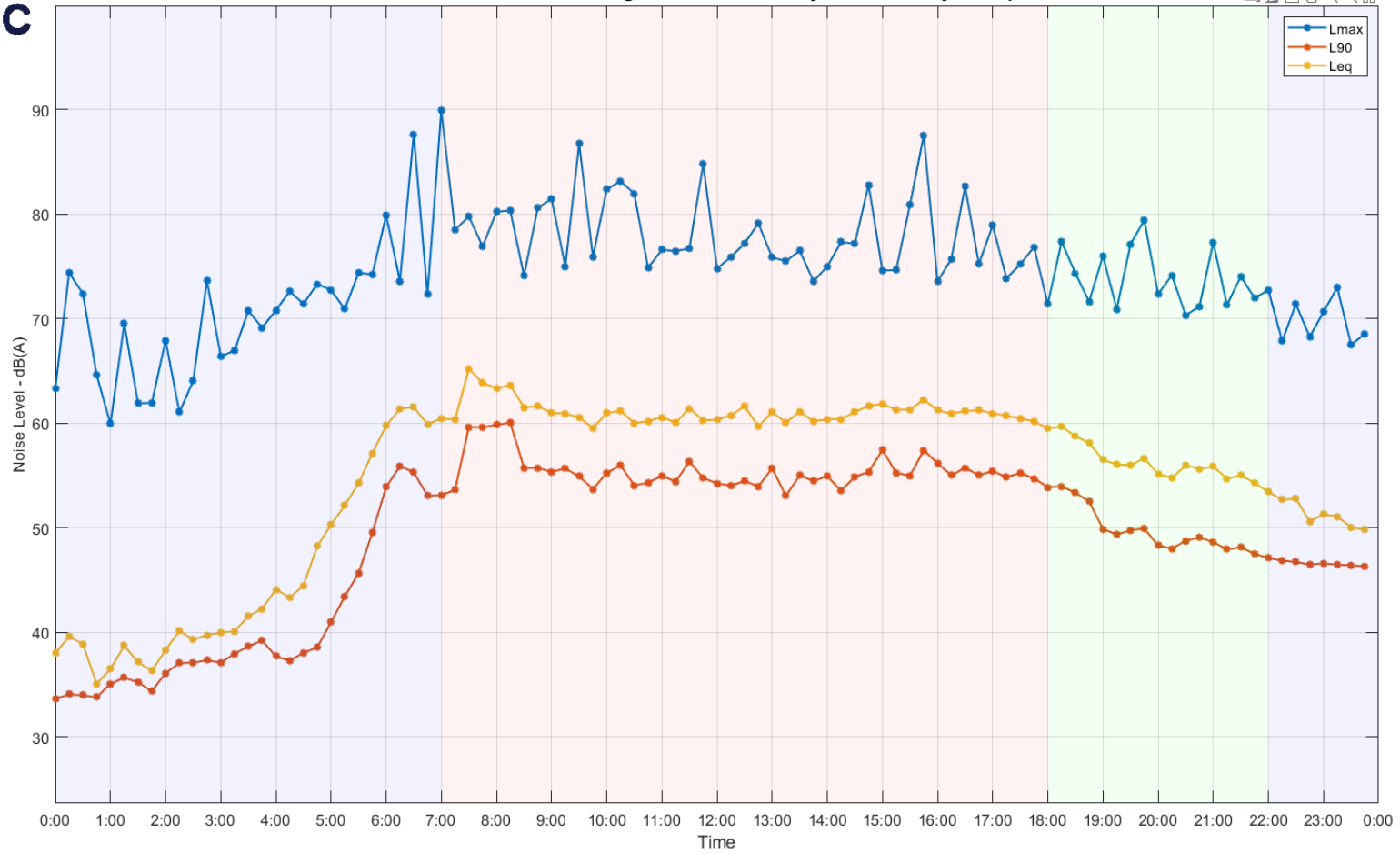


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Tuesday 20 September, 2022



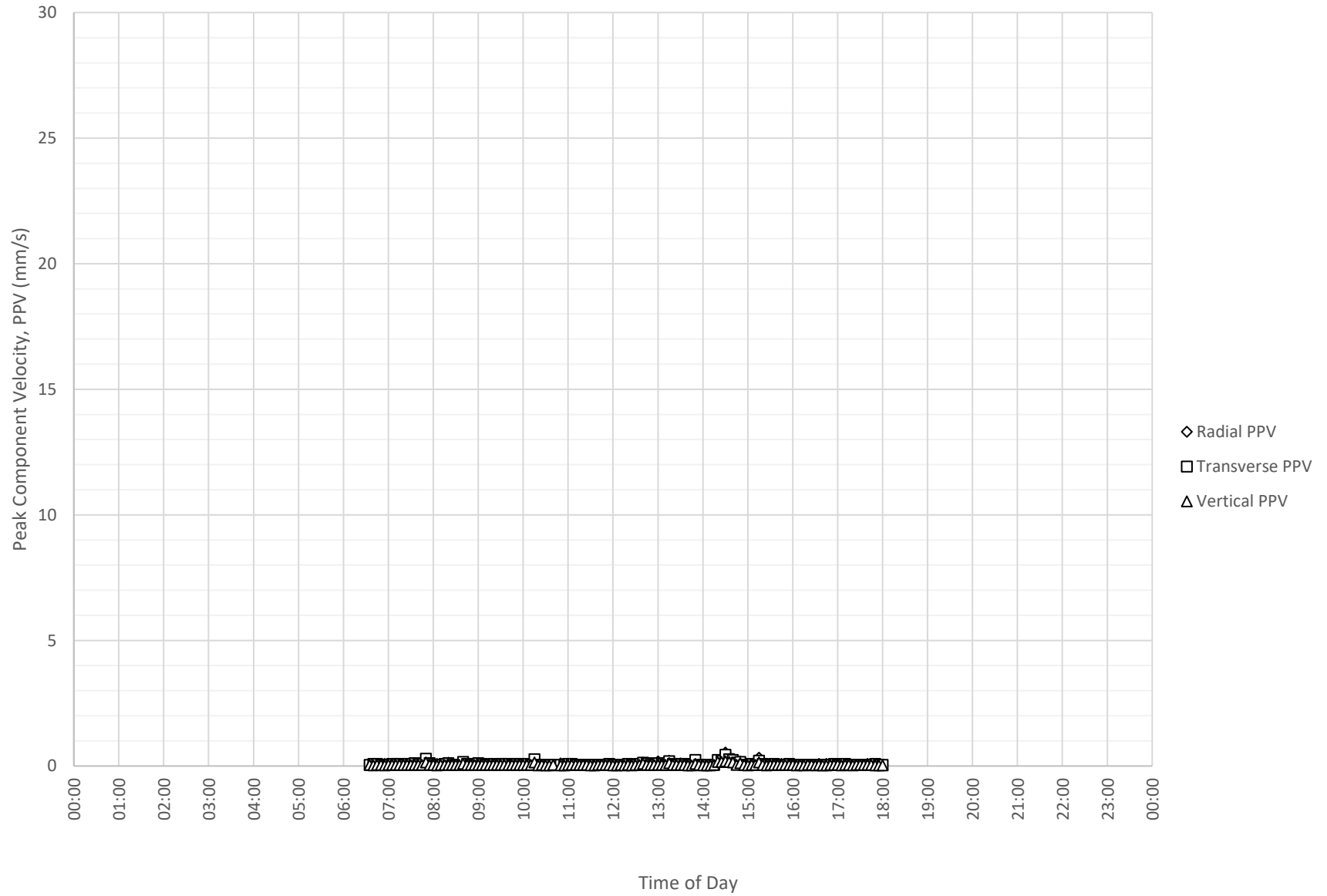


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Wednesday 21 September, 2022

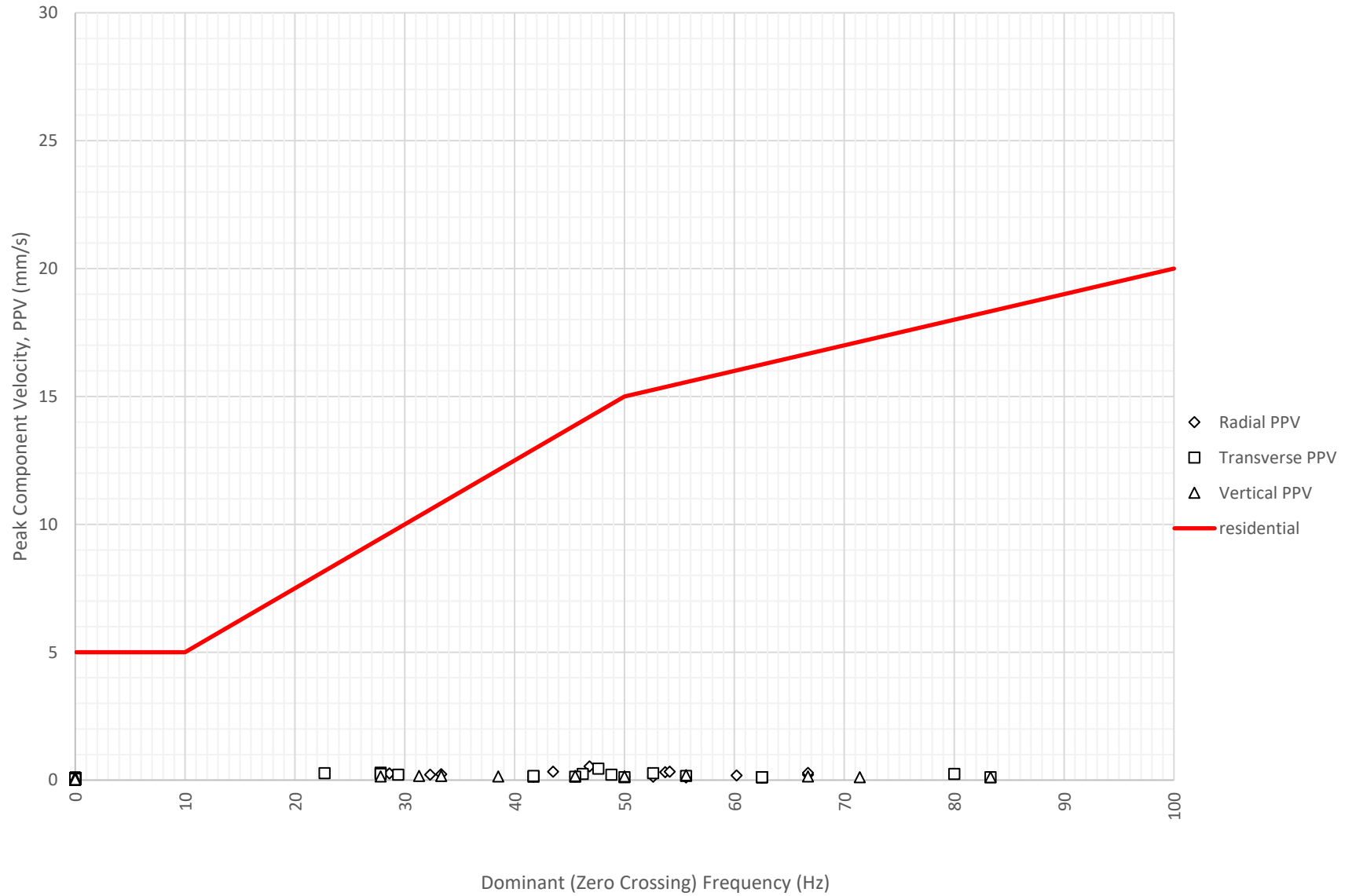


APPENDIX 2 – VIBRATION MONITORING RESULTS

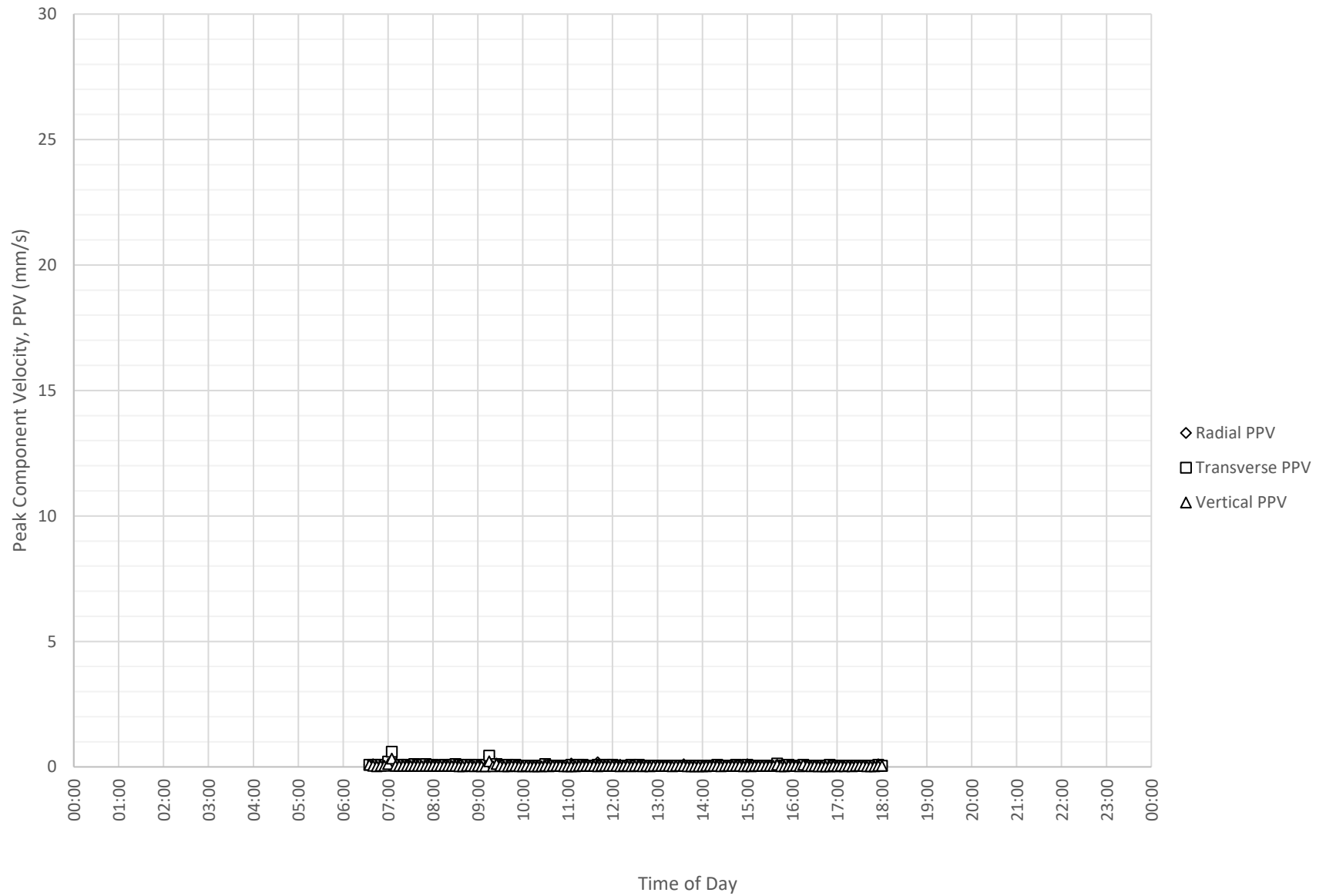
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 22-08-2022



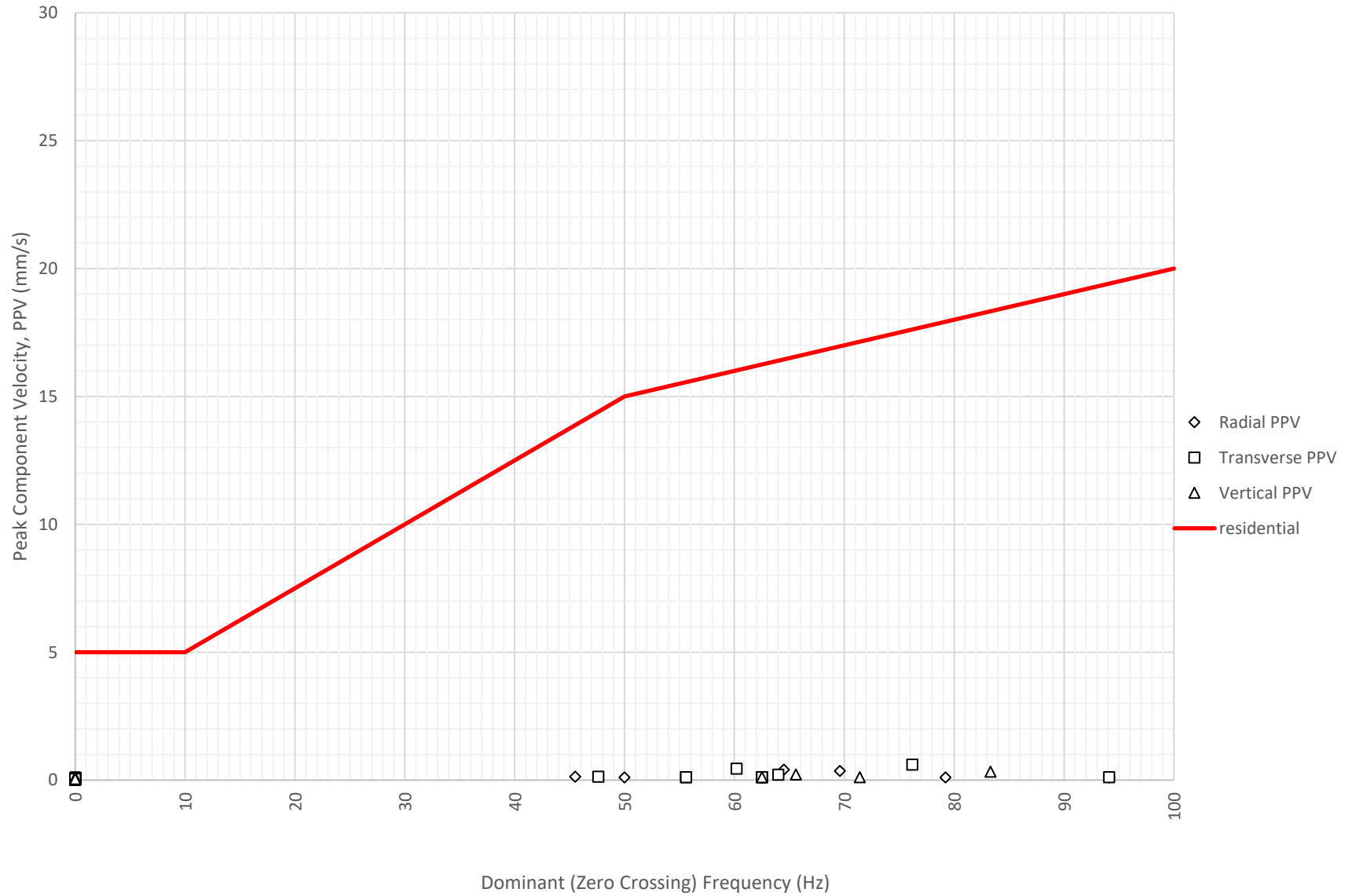
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 22-08-2022



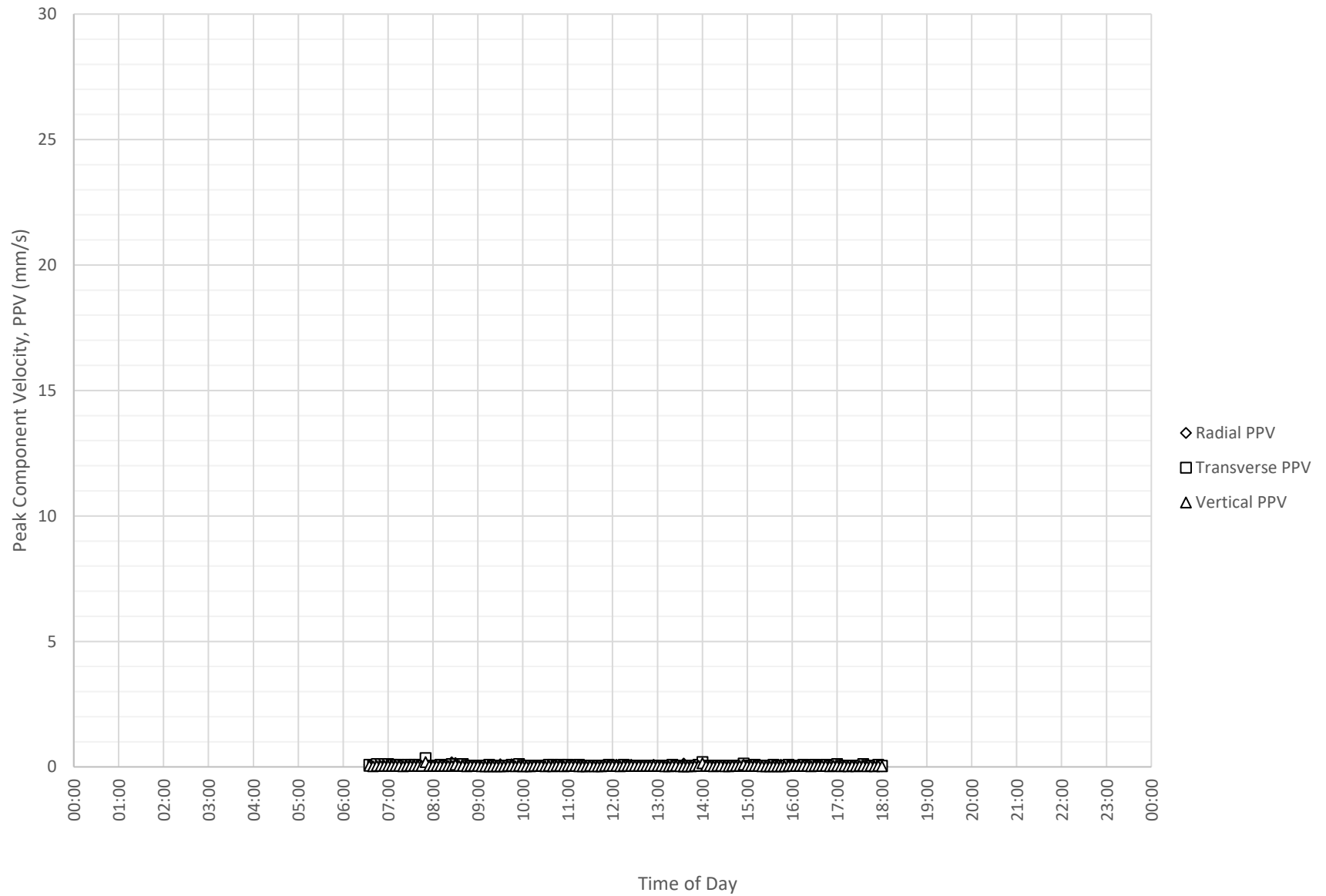
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 23-08-2022



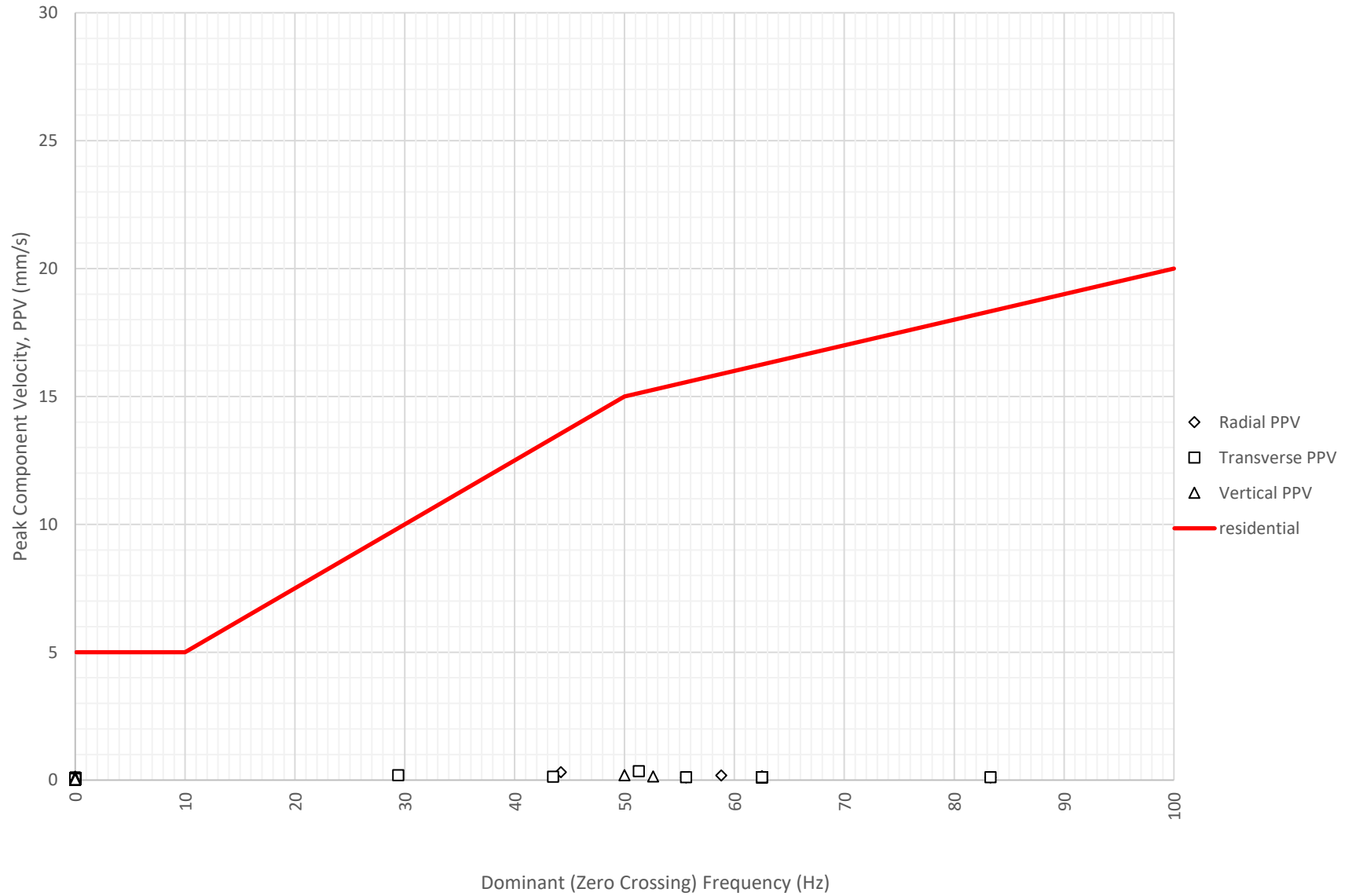
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 23-08-2022



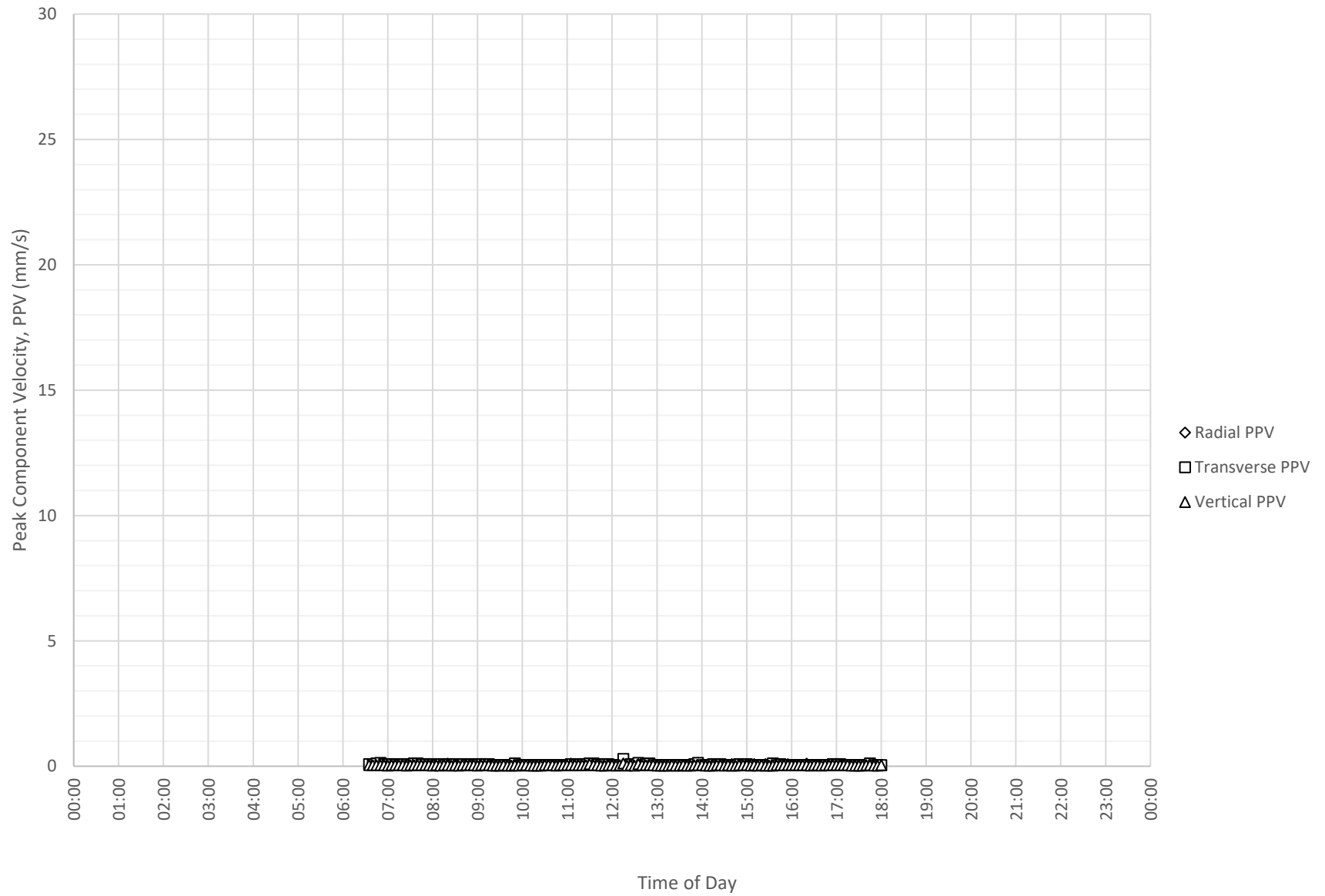
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 24-08-2022



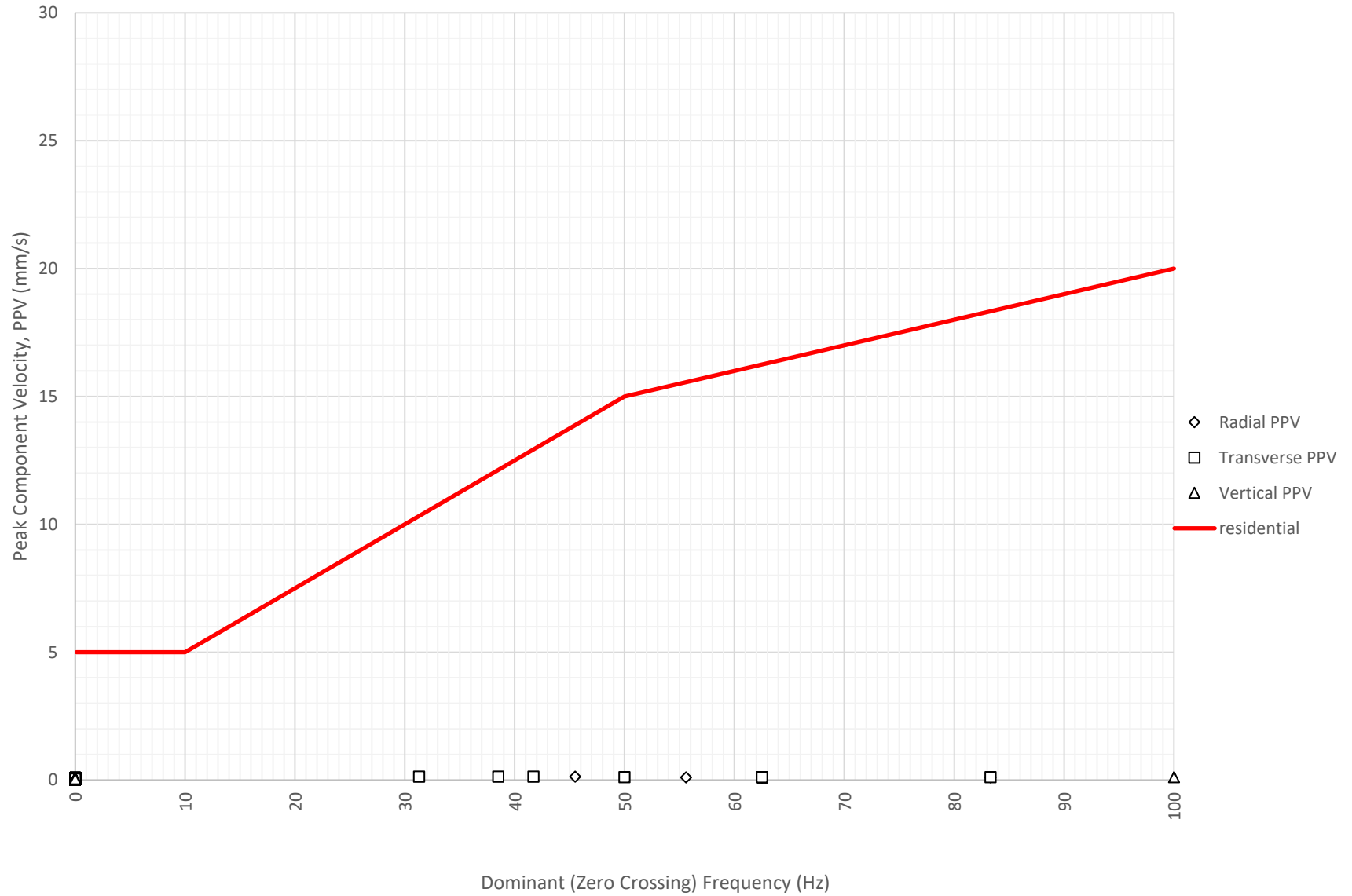
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 24-08-2022



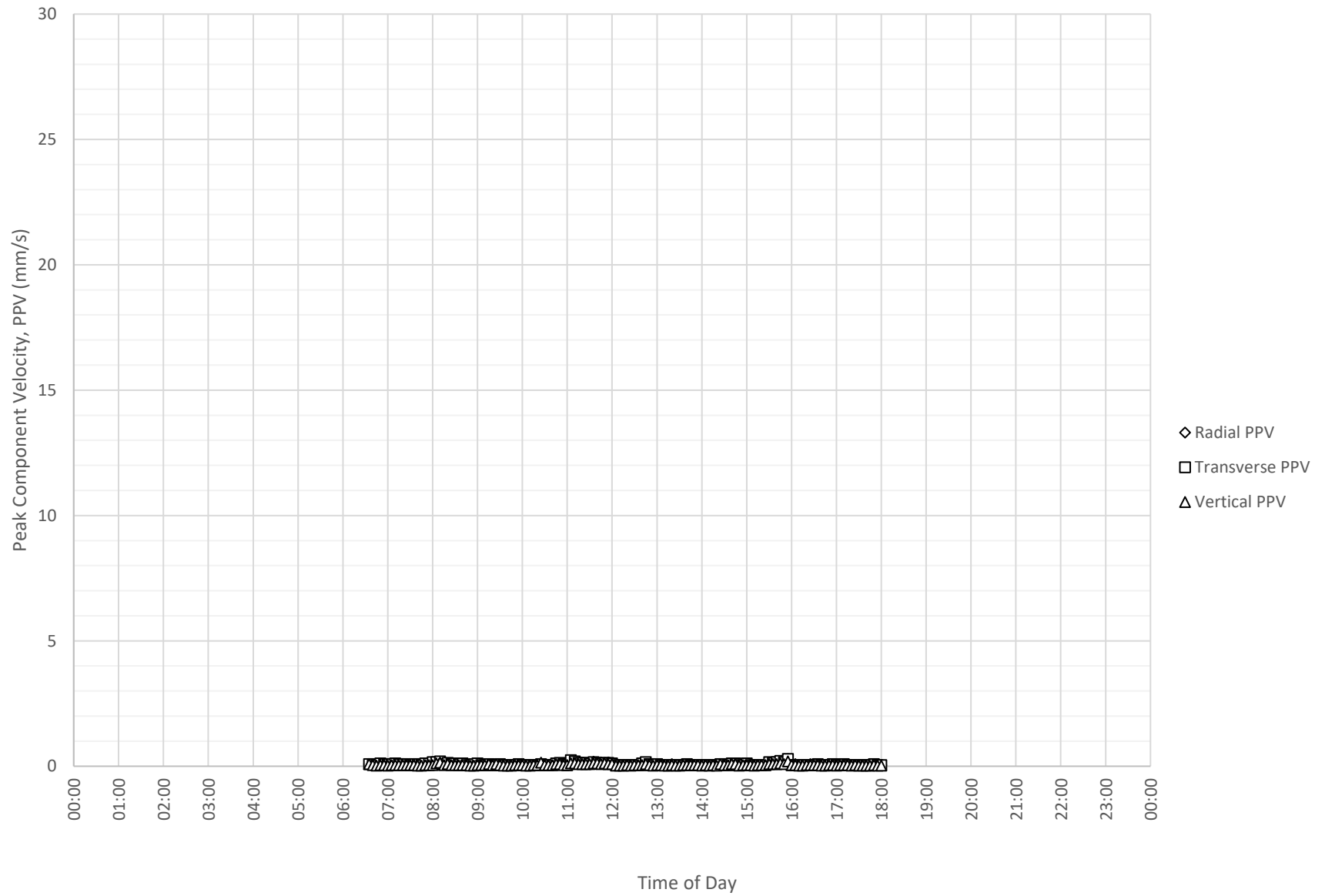
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 25-08-2022



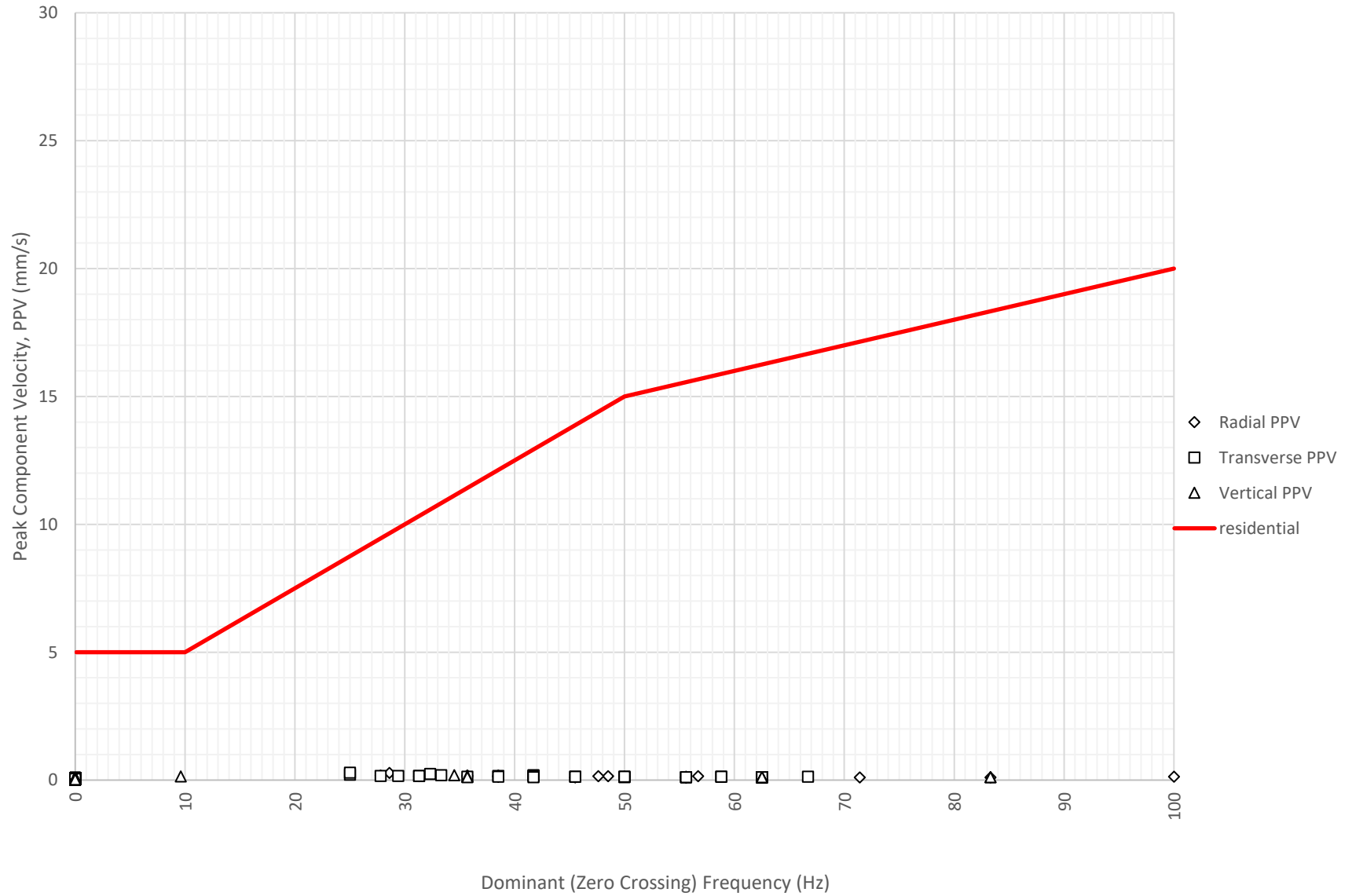
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 25-08-2022



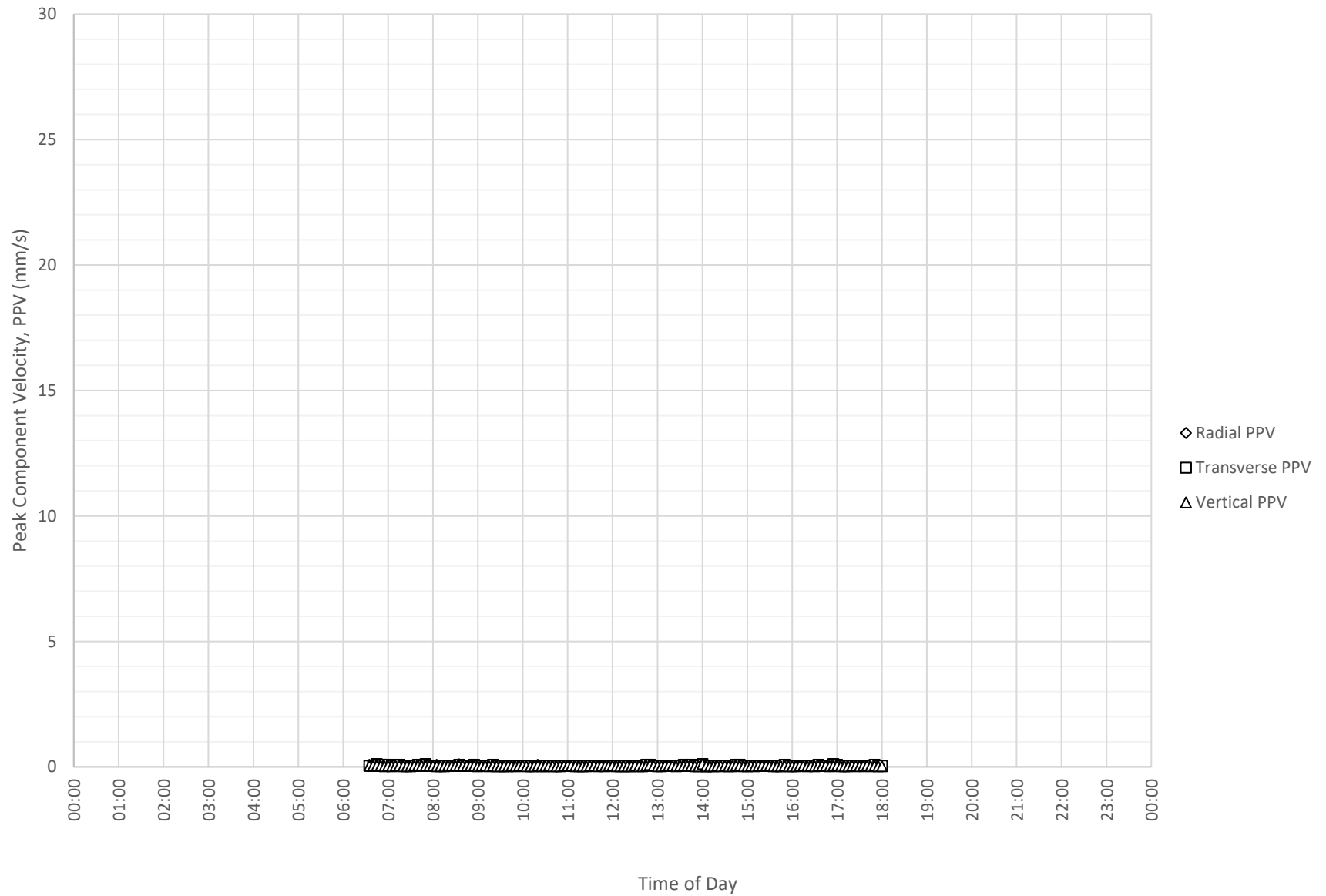
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 26-08-2022



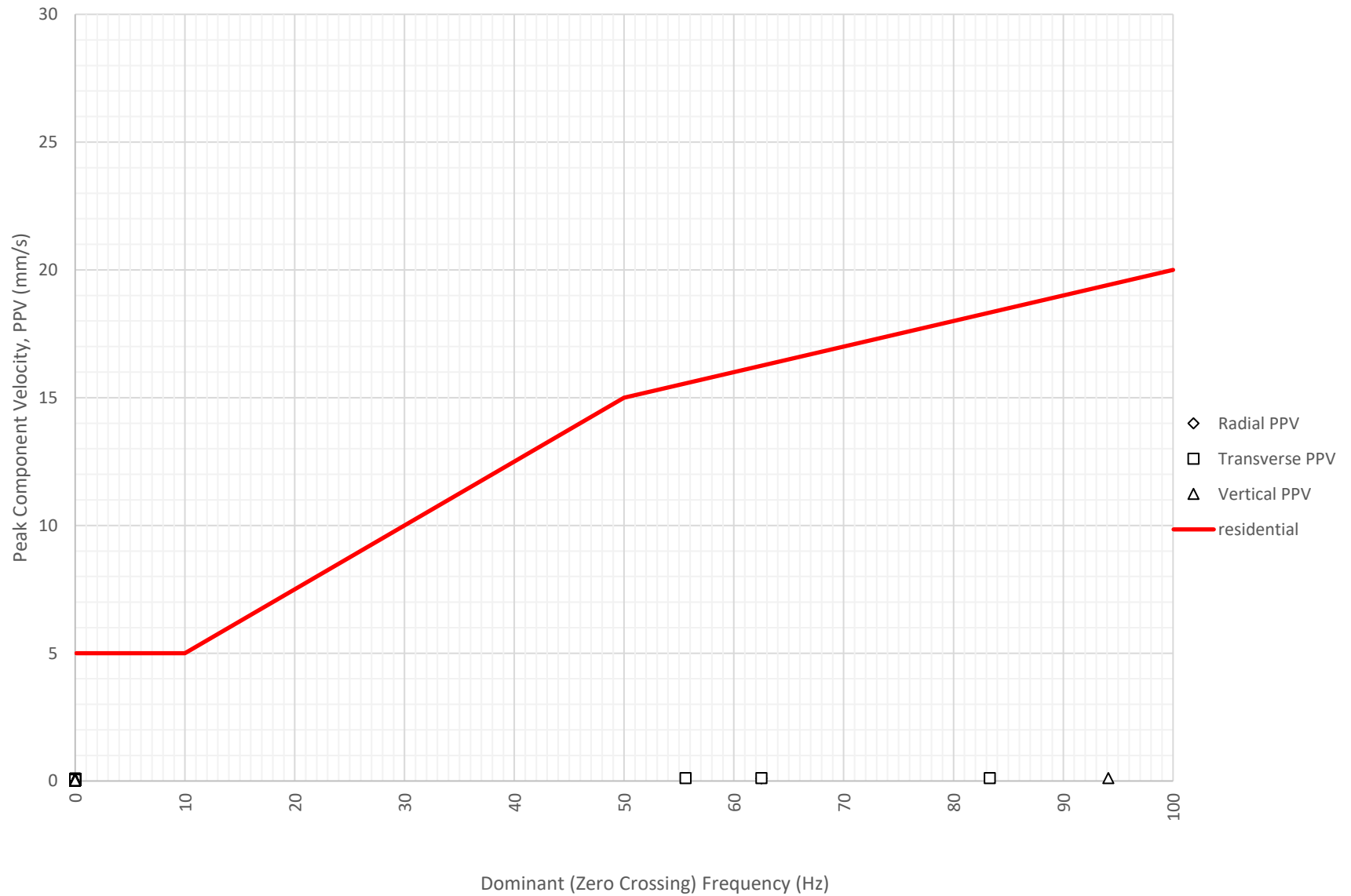
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 26-08-2022



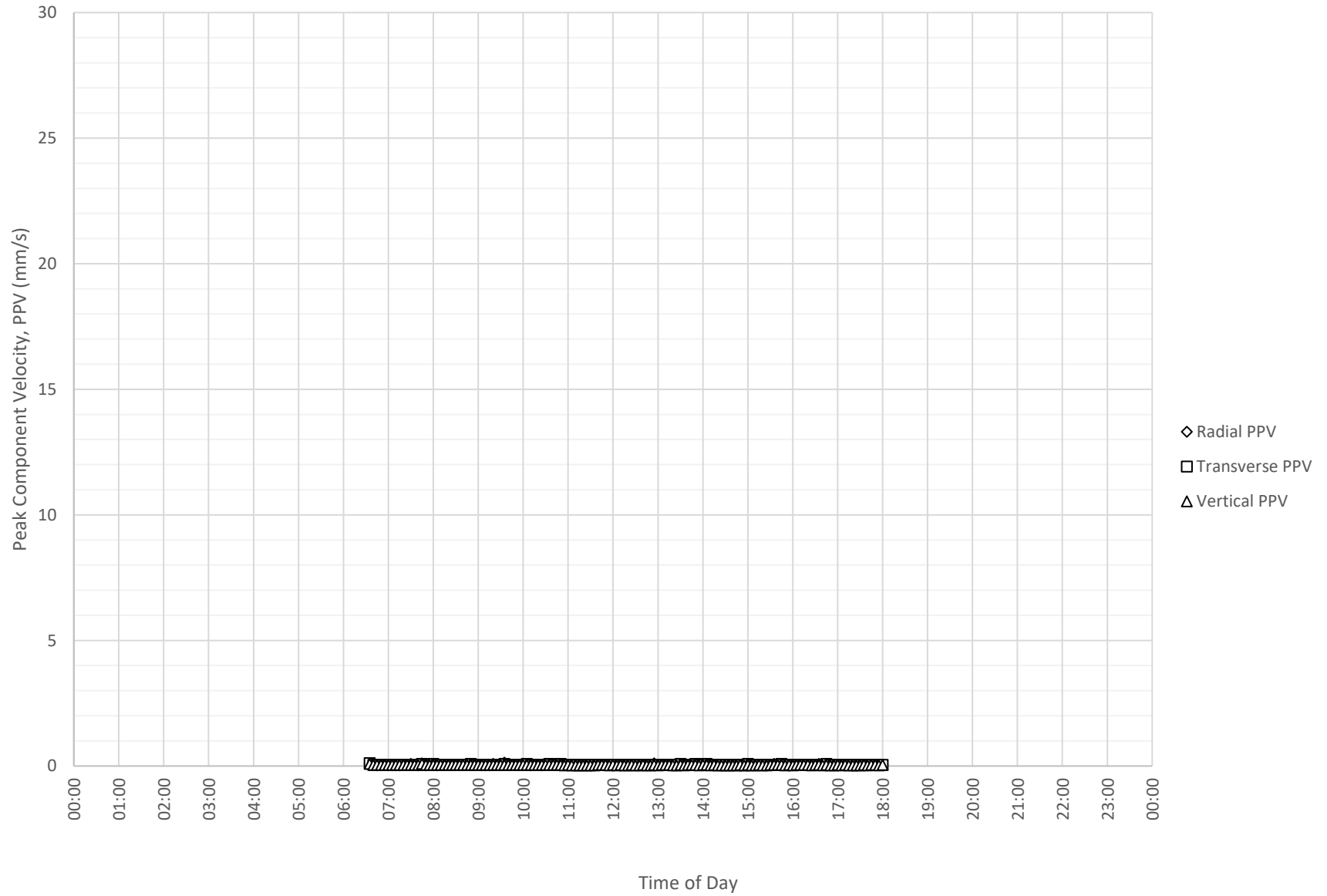
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 27-08-2022



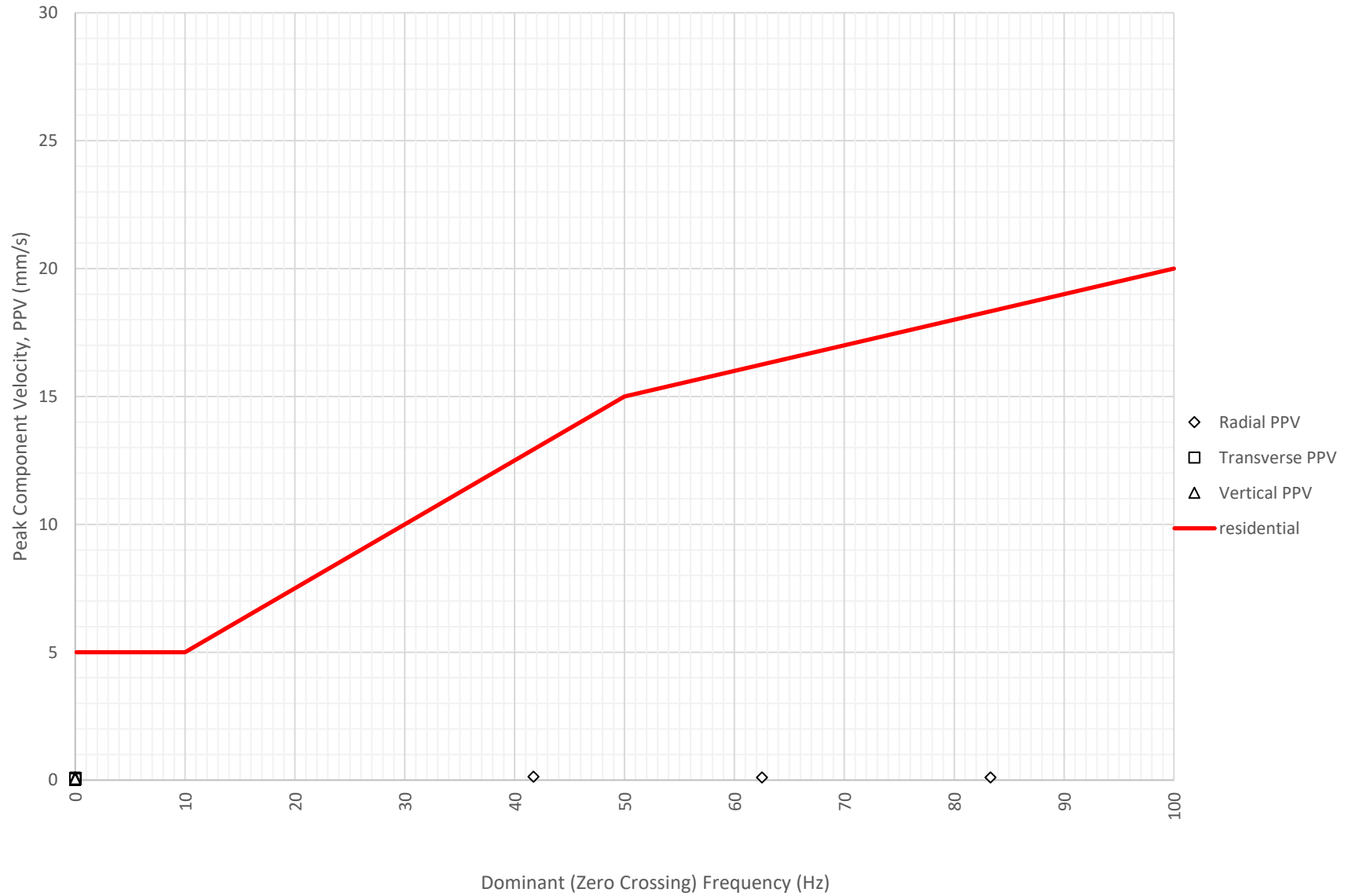
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 27-08-2022



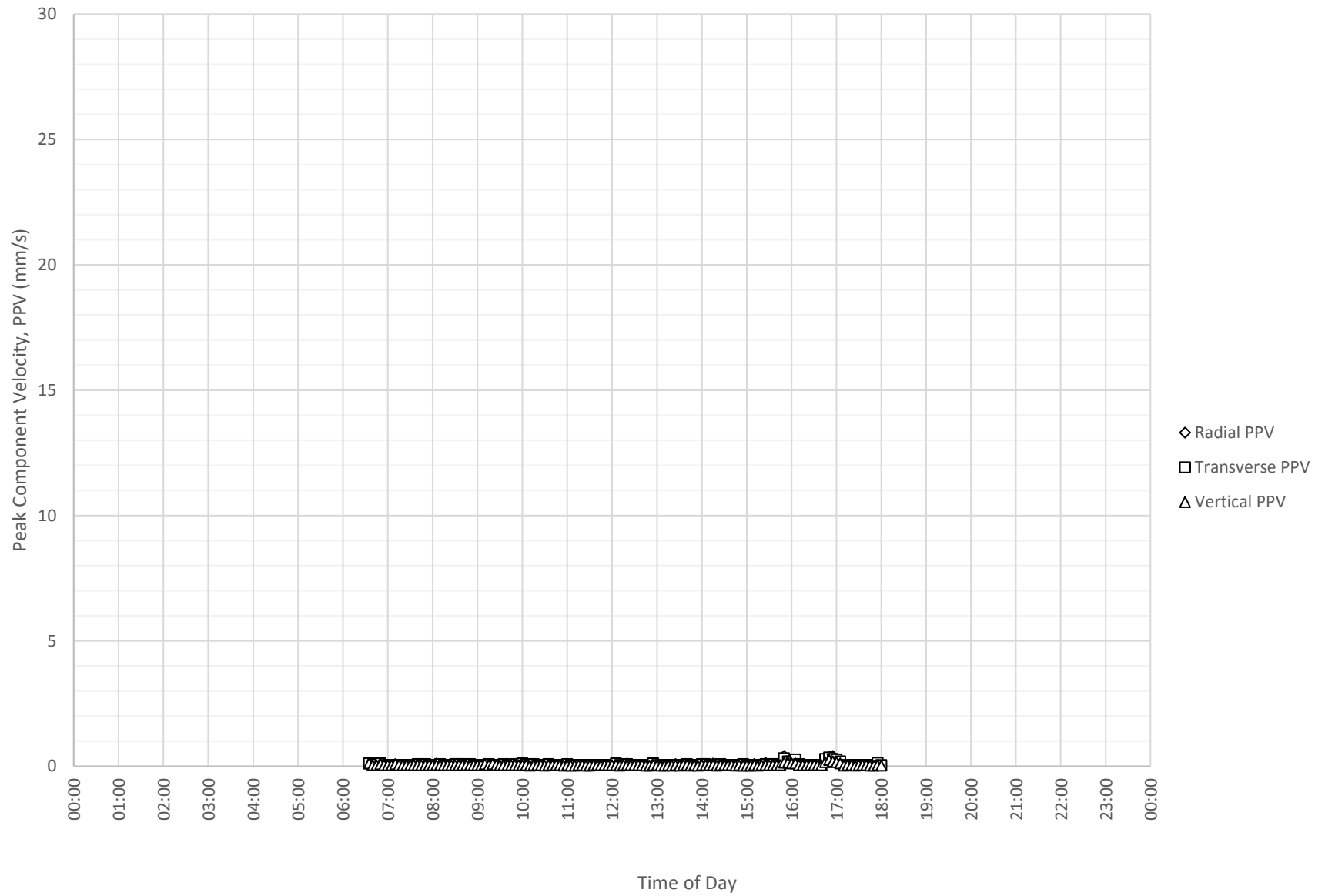
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 28-08-2022



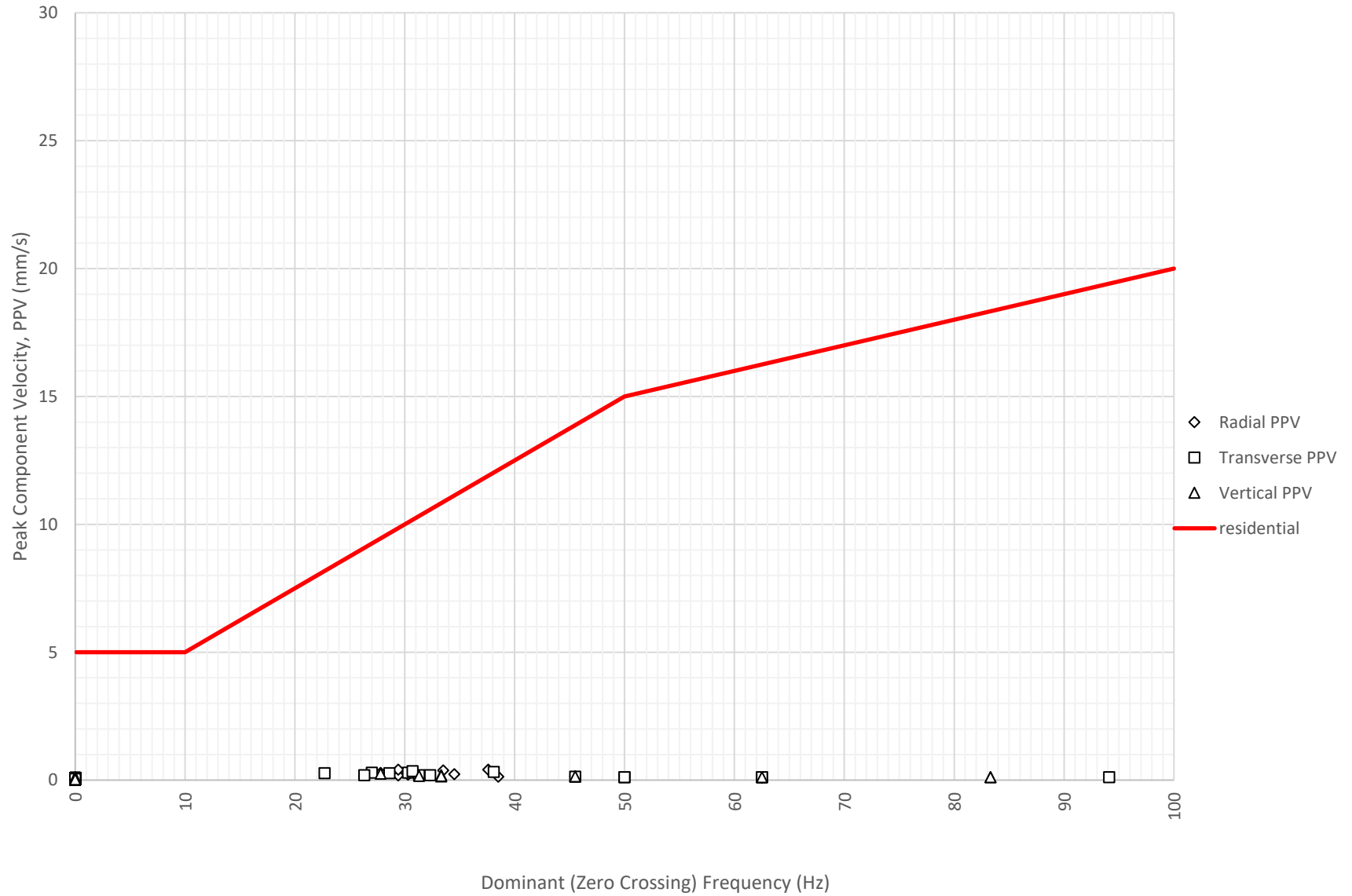
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 28-08-2022



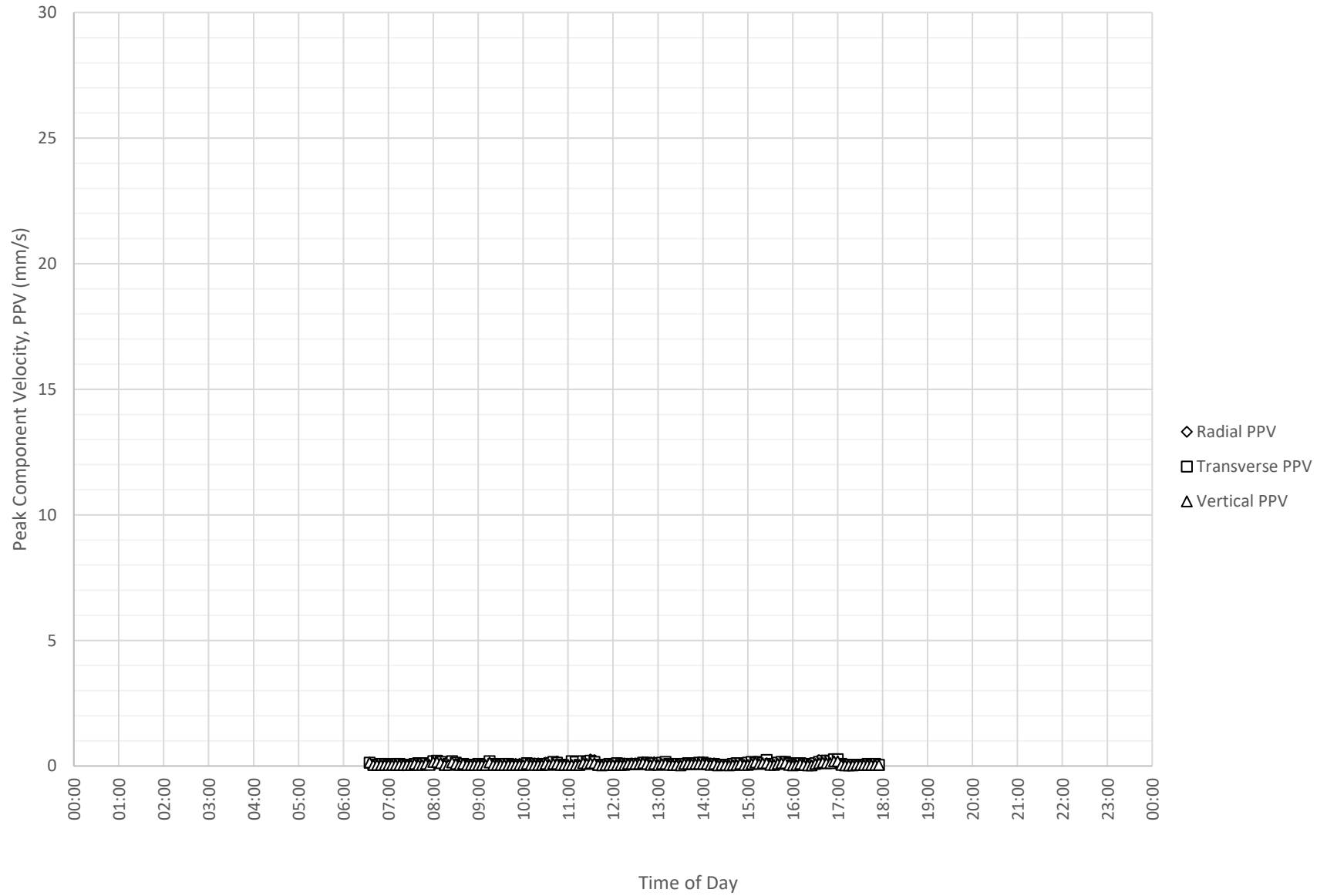
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 29-08-2022



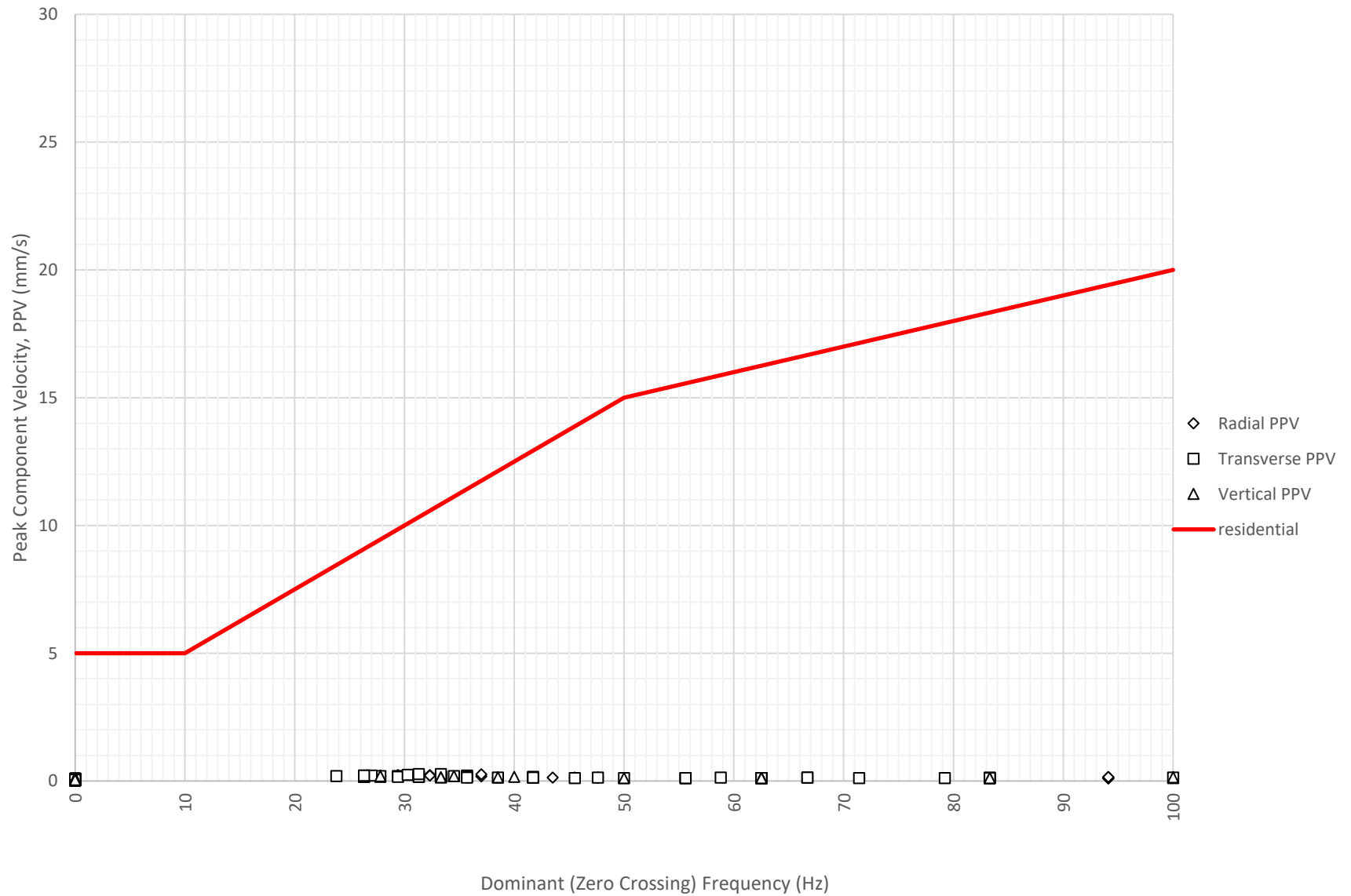
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 29-08-2022



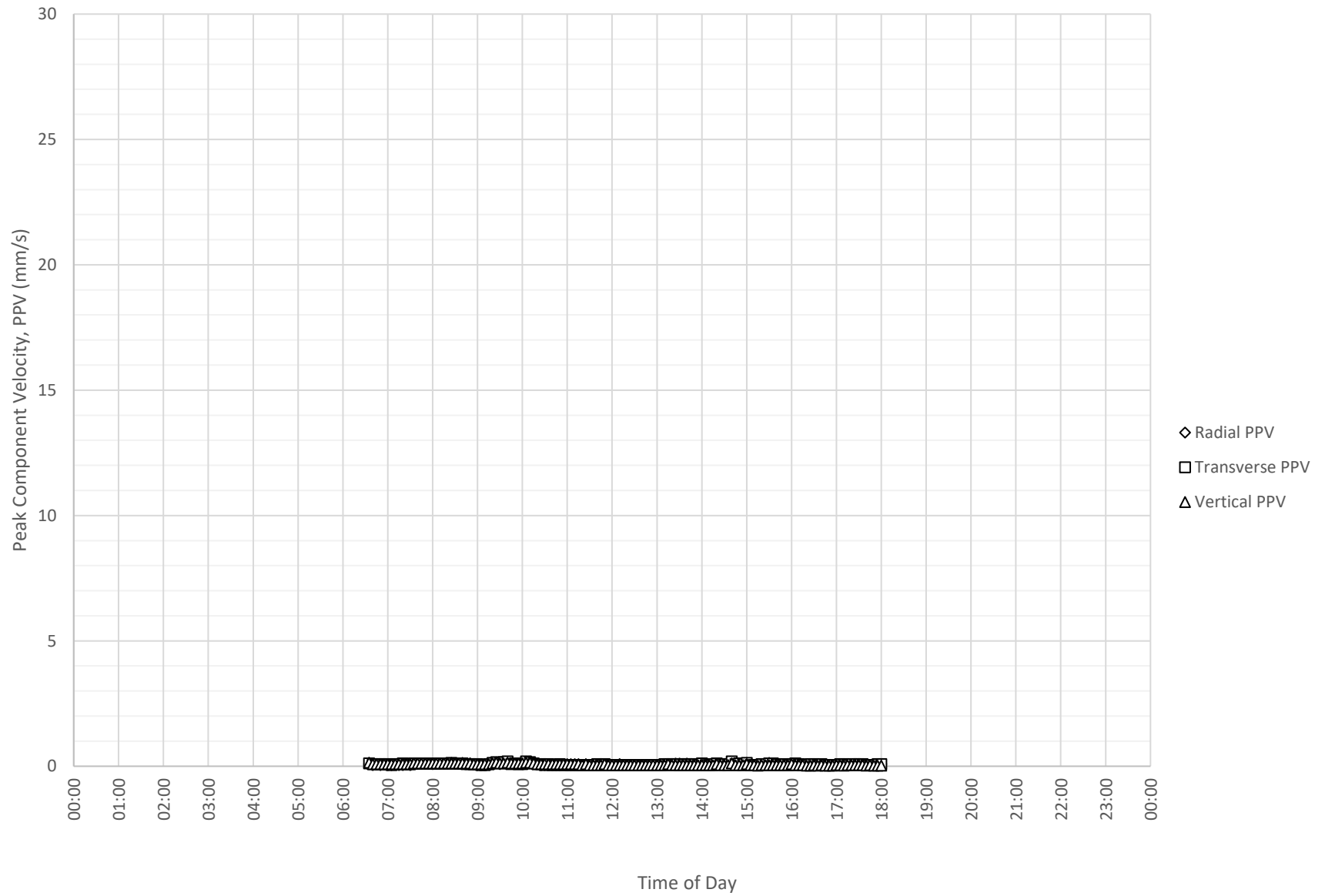
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 30-08-2022



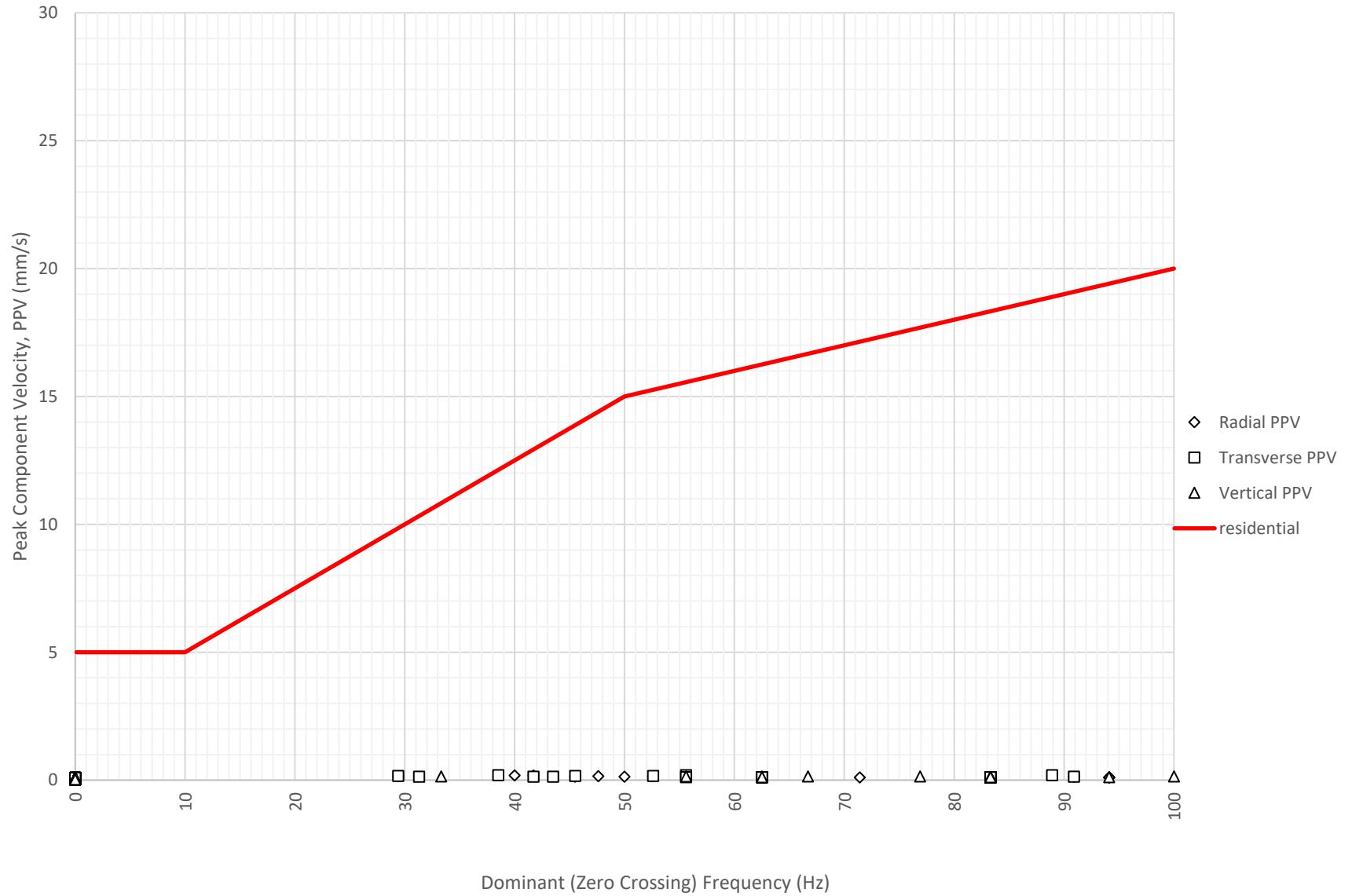
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 30-08-2022



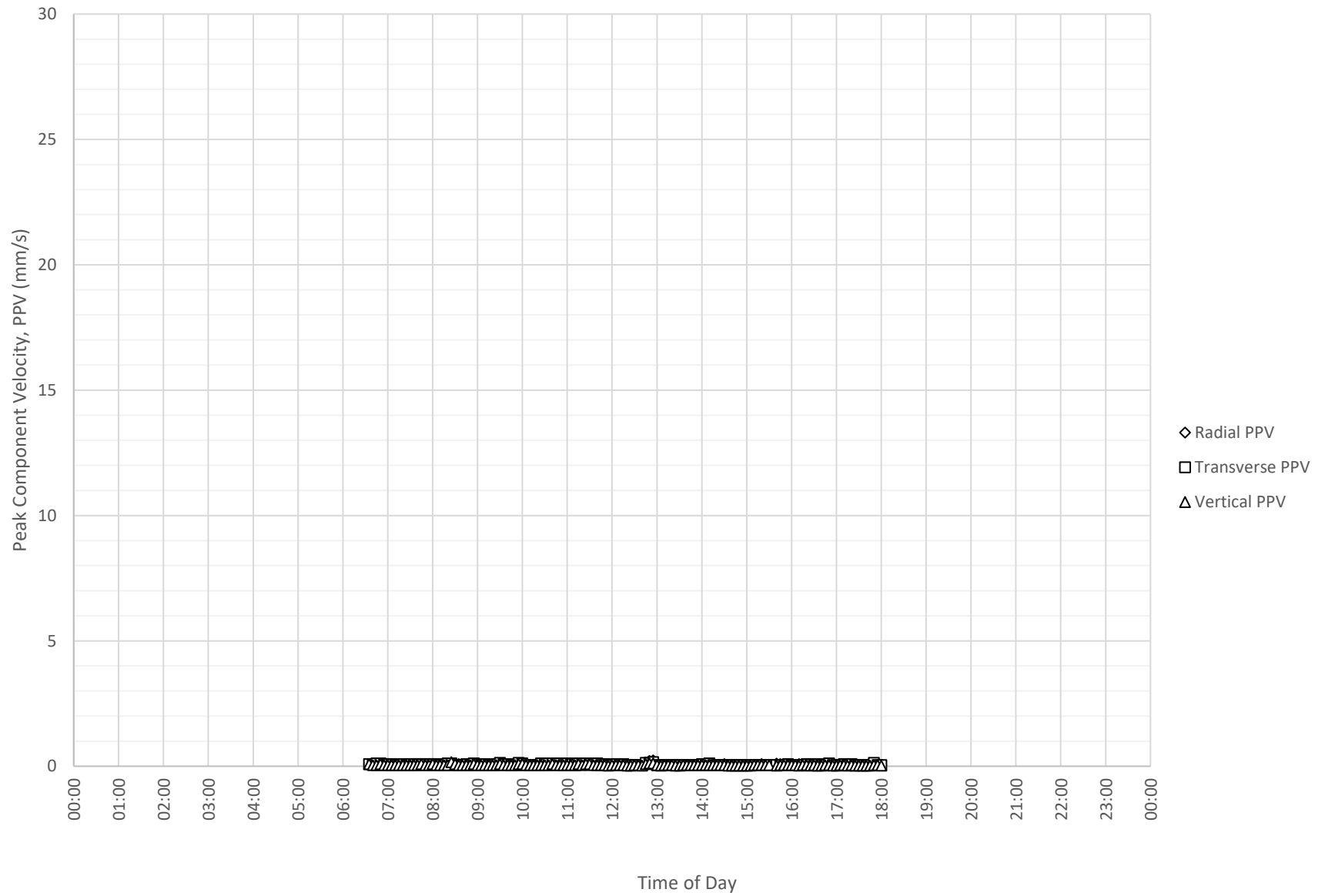
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 31-08-2022



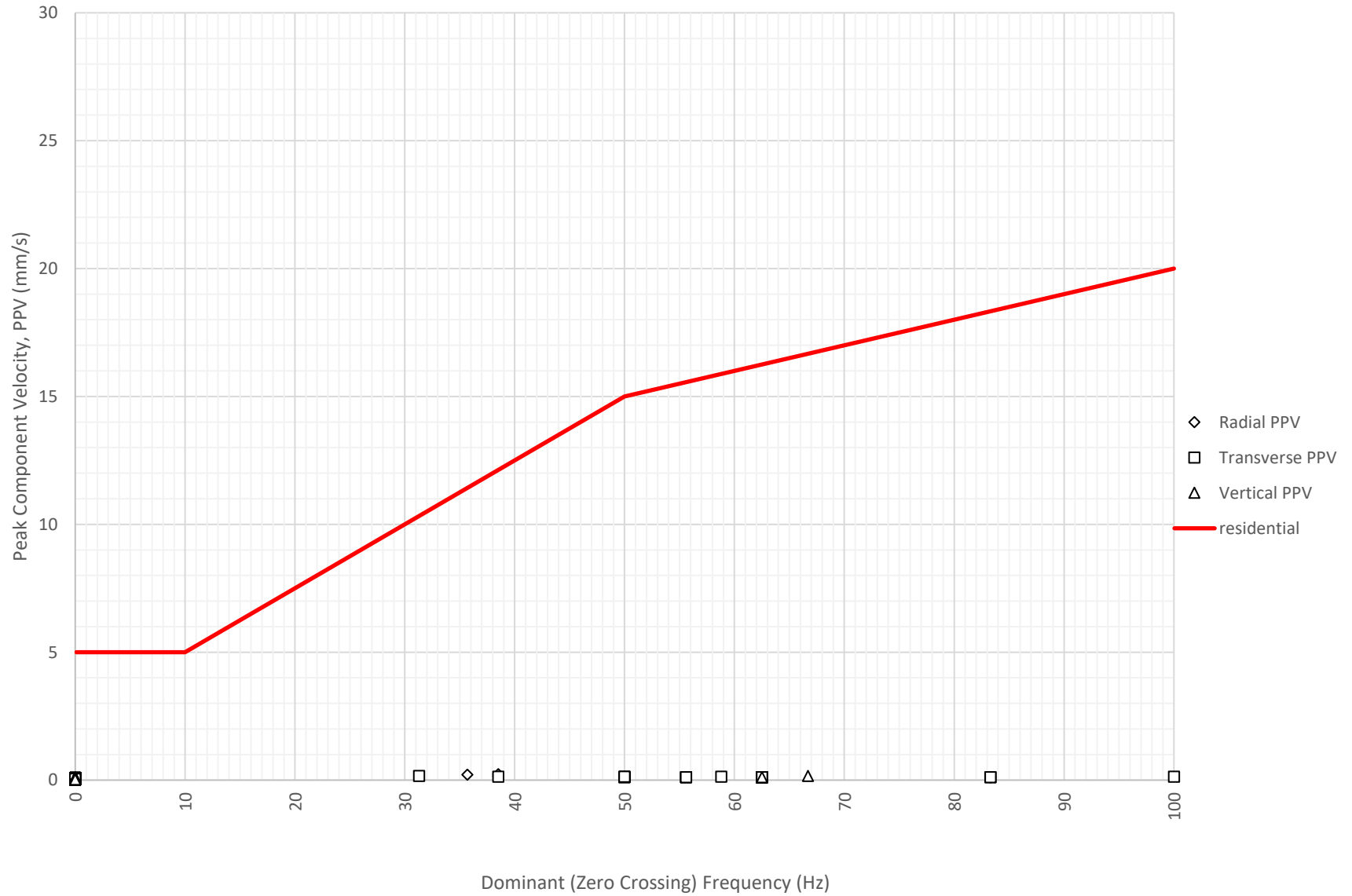
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 31-08-2022



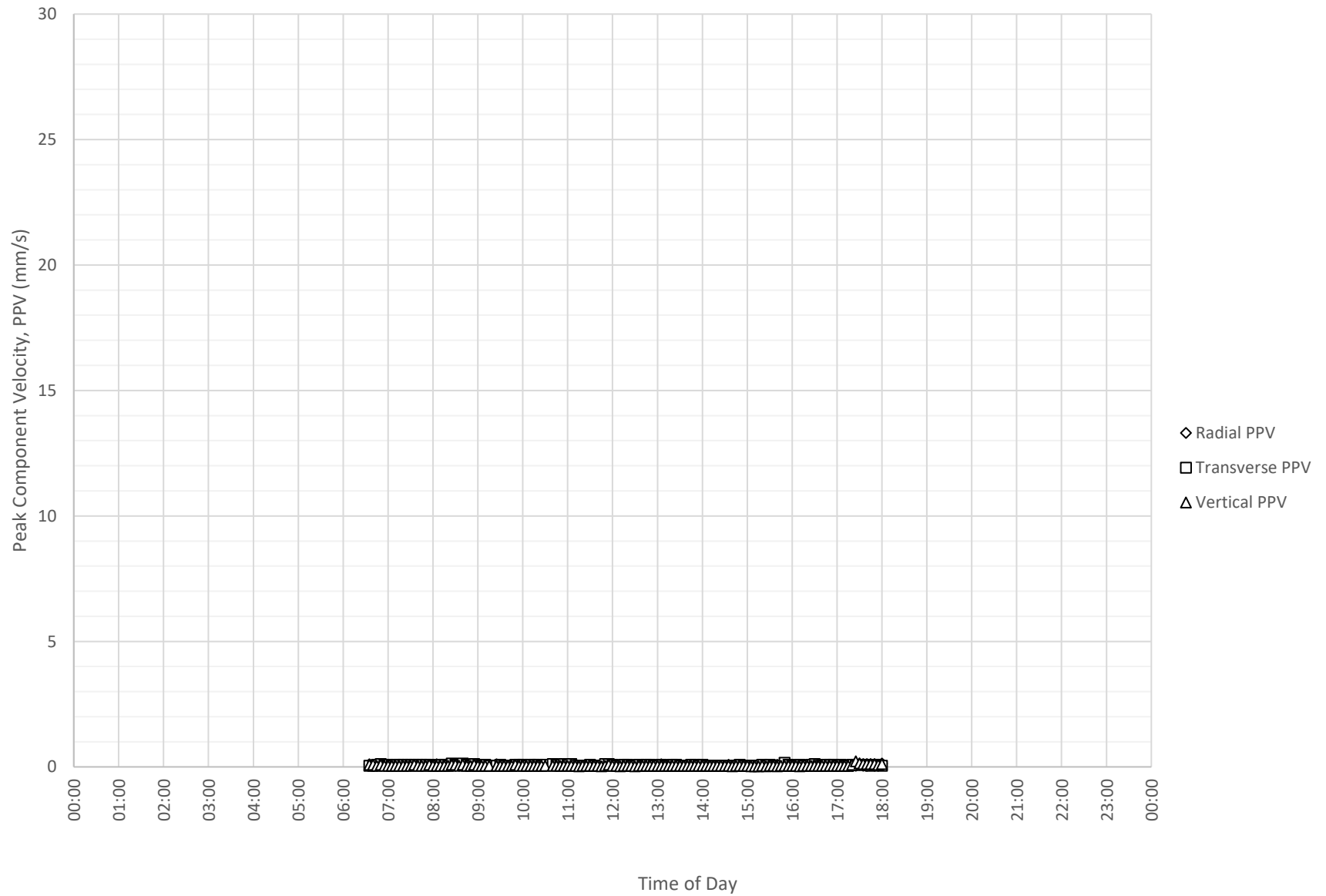
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 1-09-2022



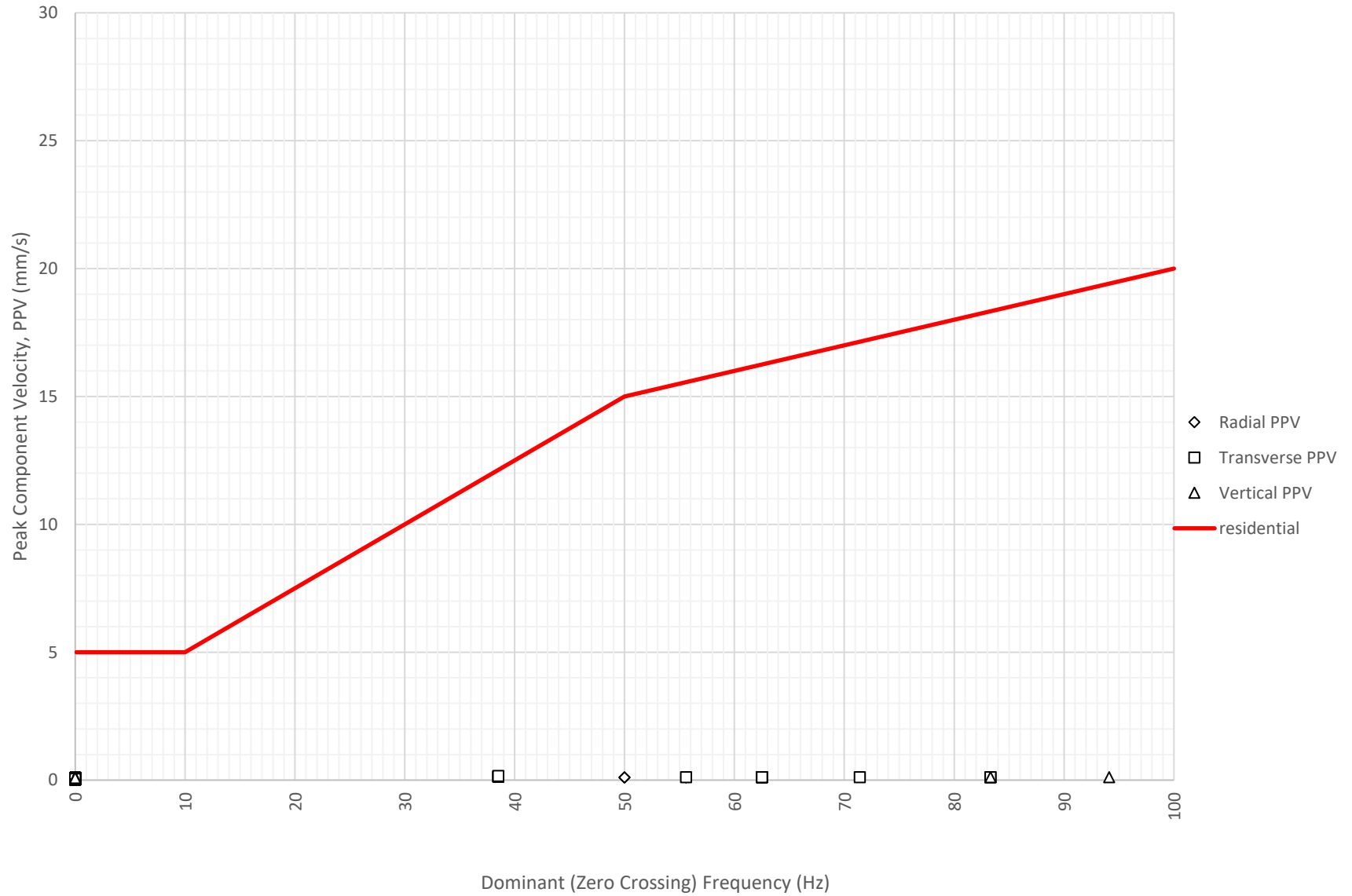
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 1-09-2022



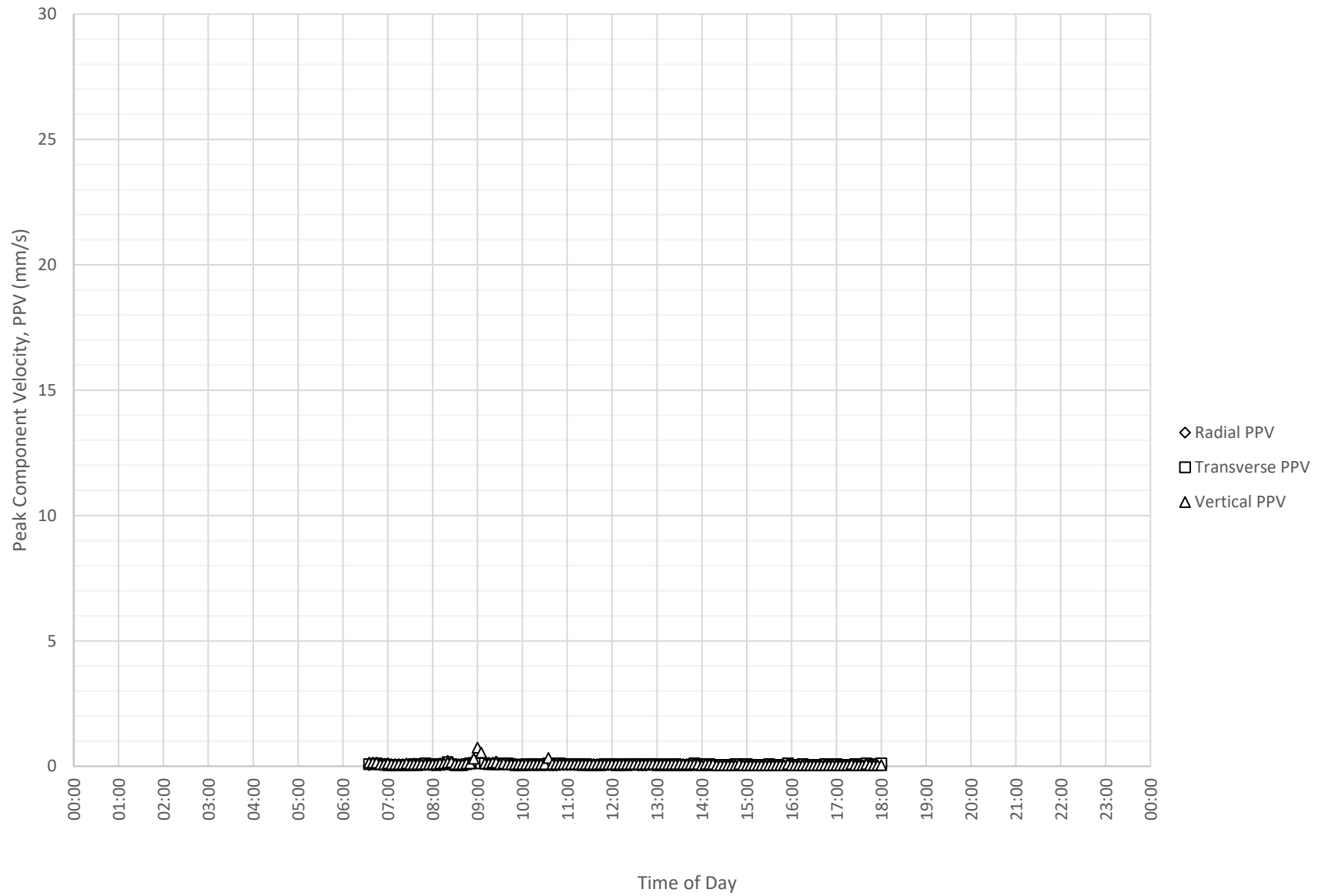
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 2-09-2022



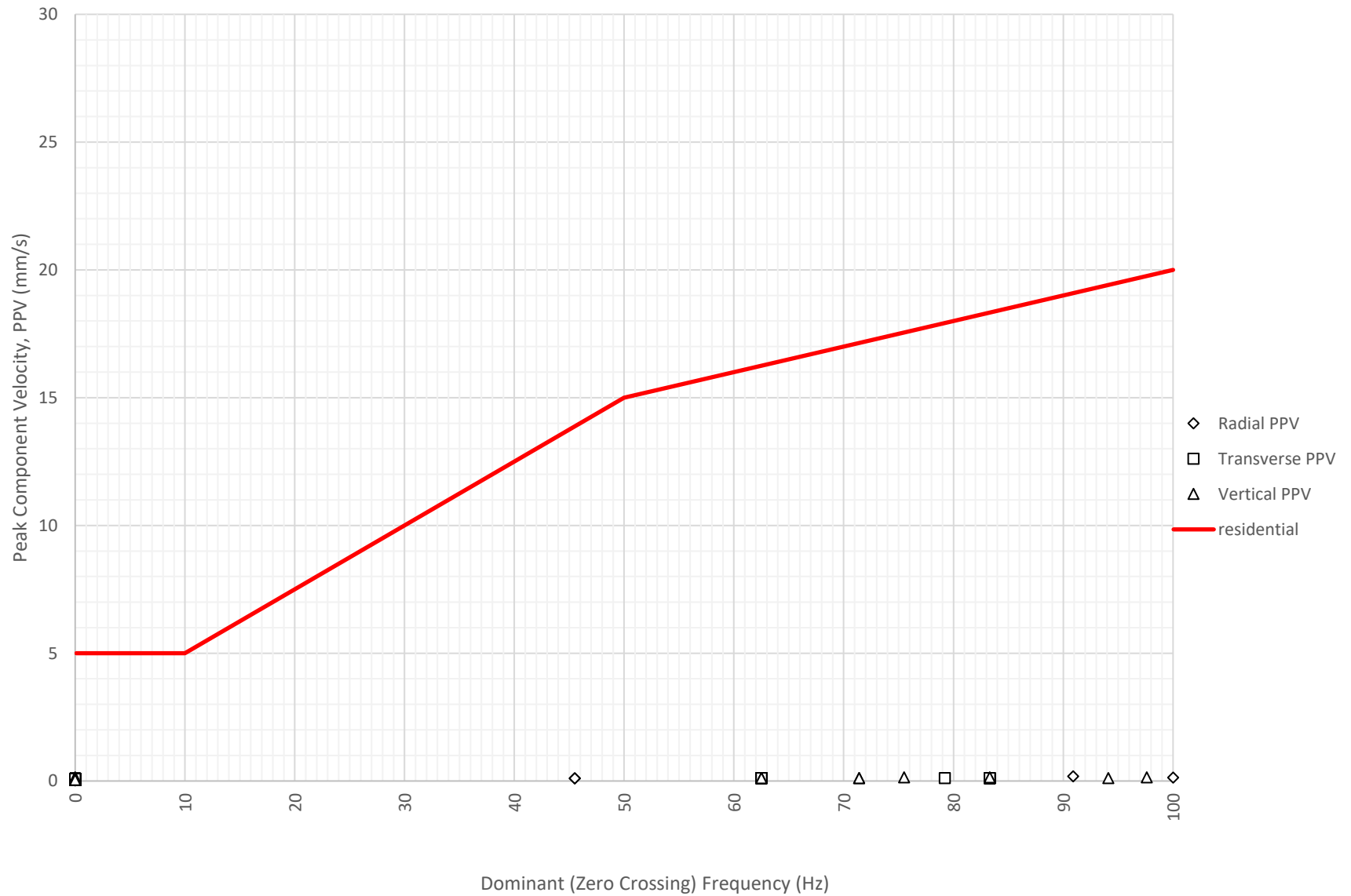
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 2-09-2022



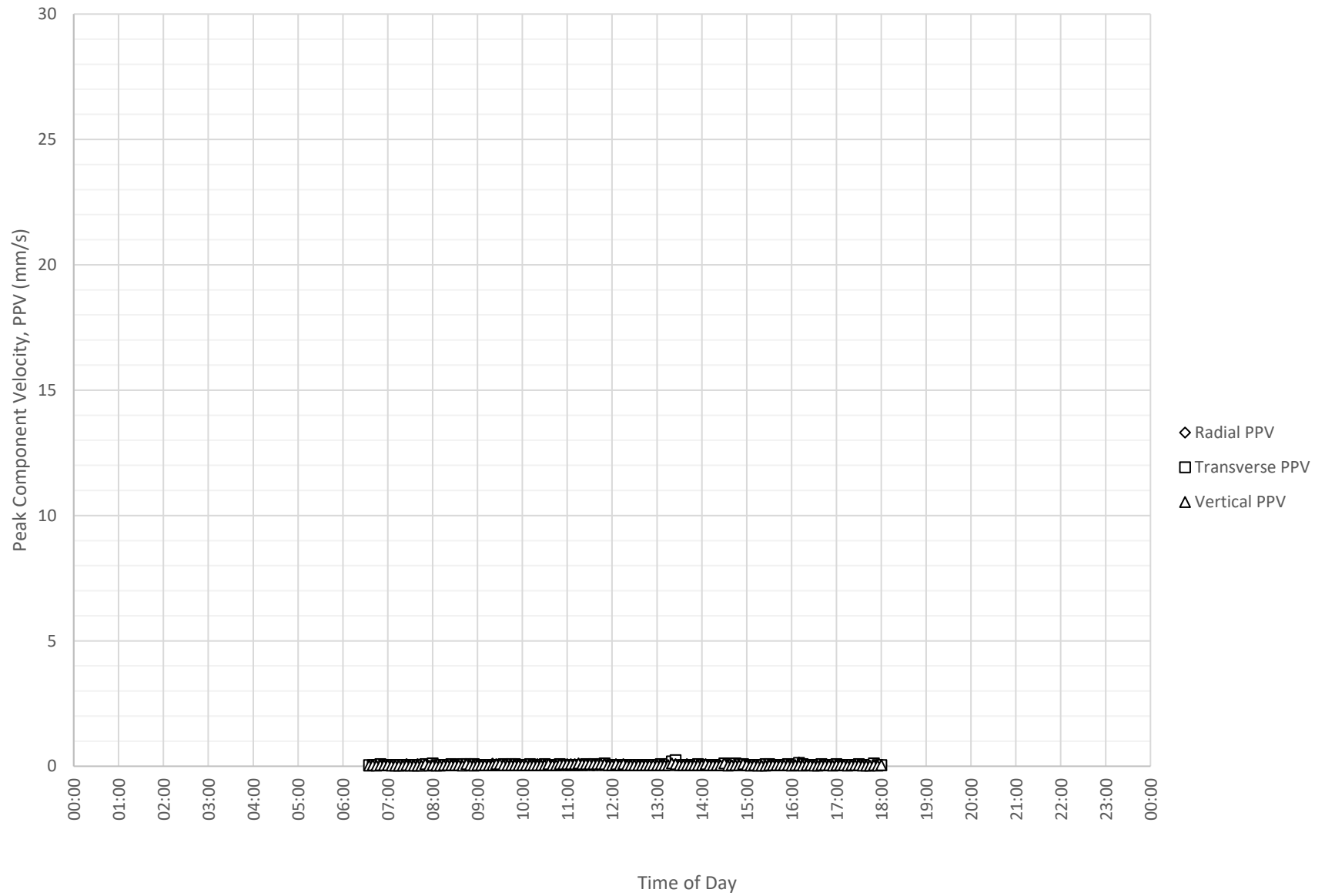
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 3-09-2022



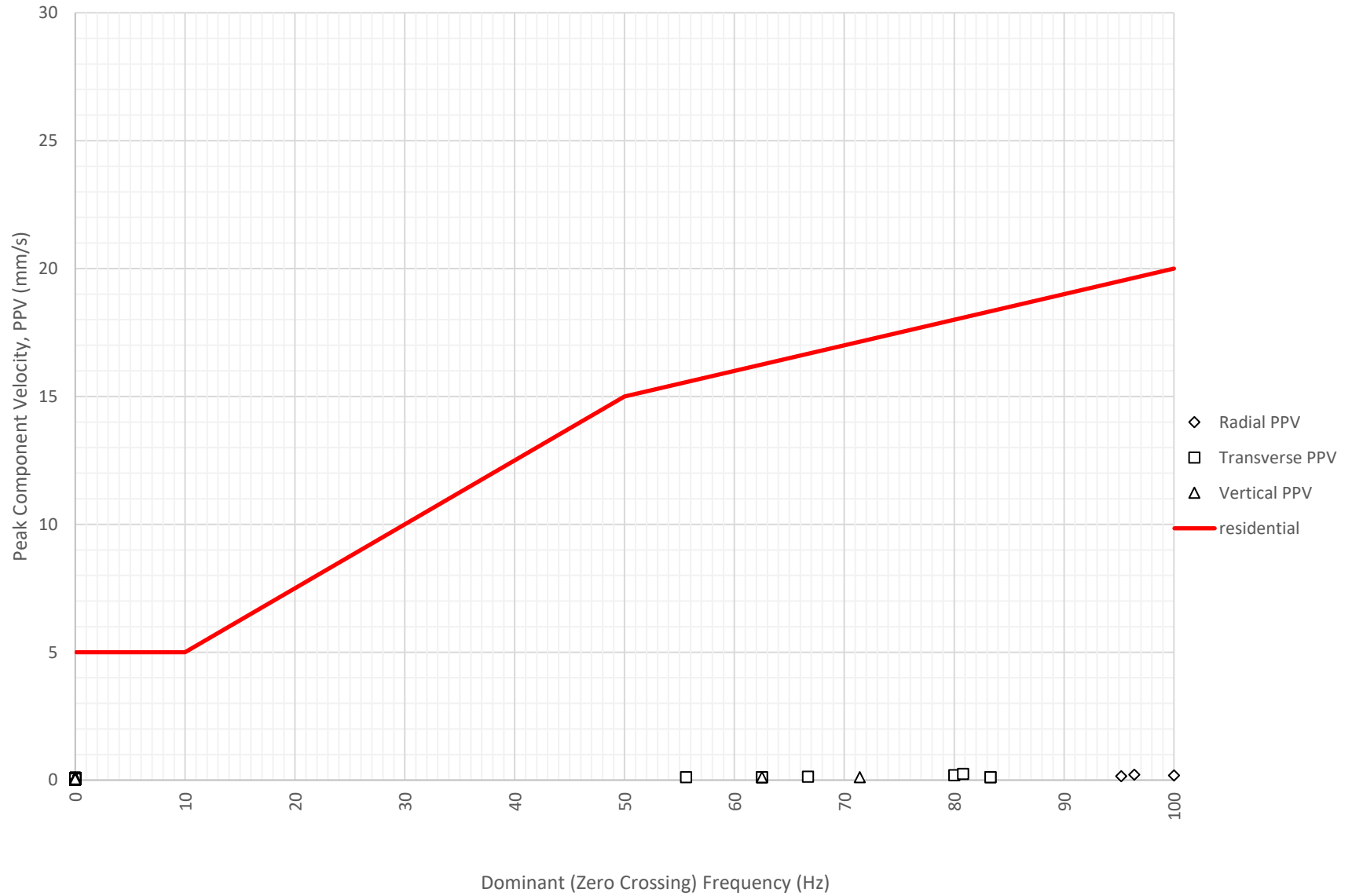
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 3-09-2022



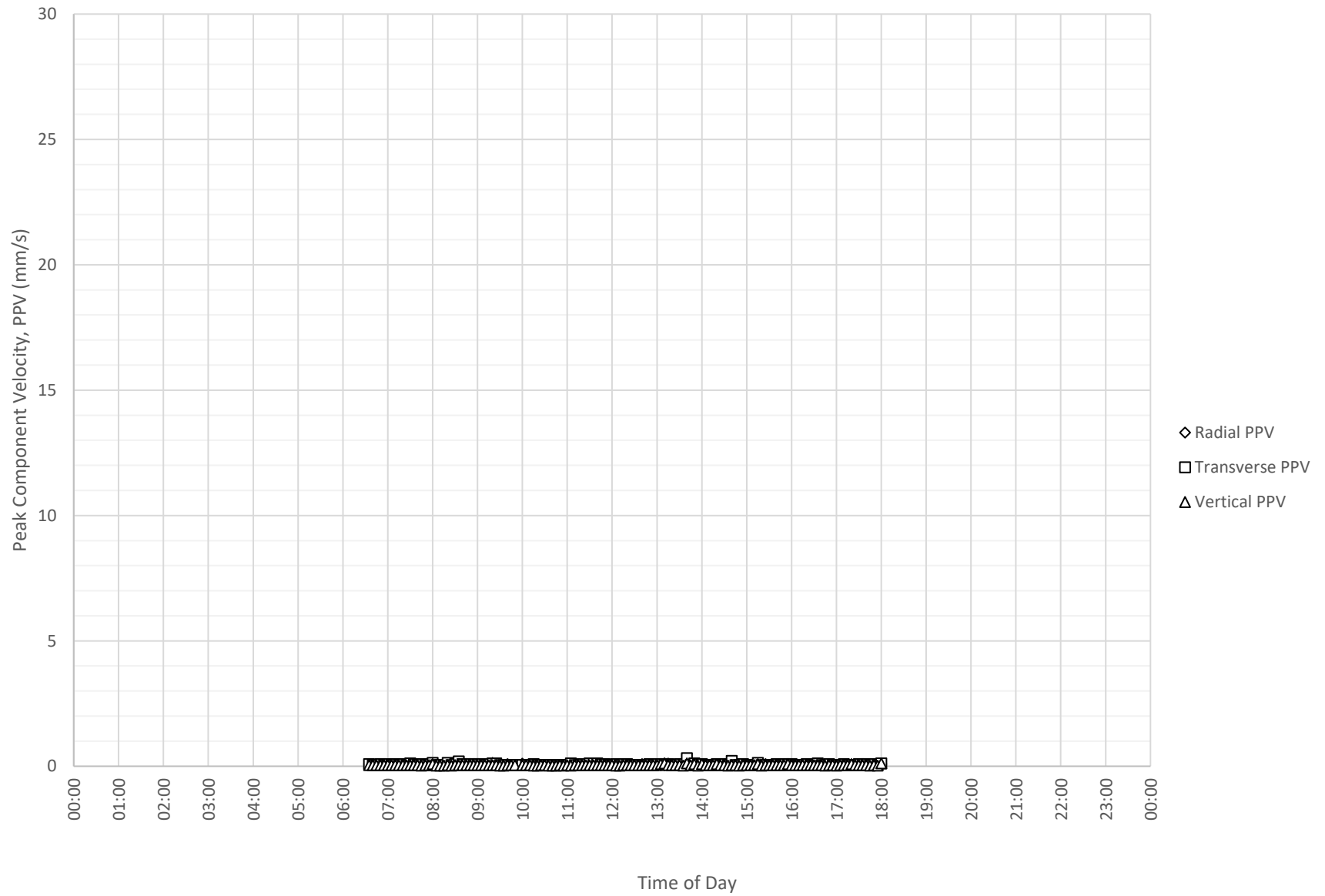
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 4-09-2022



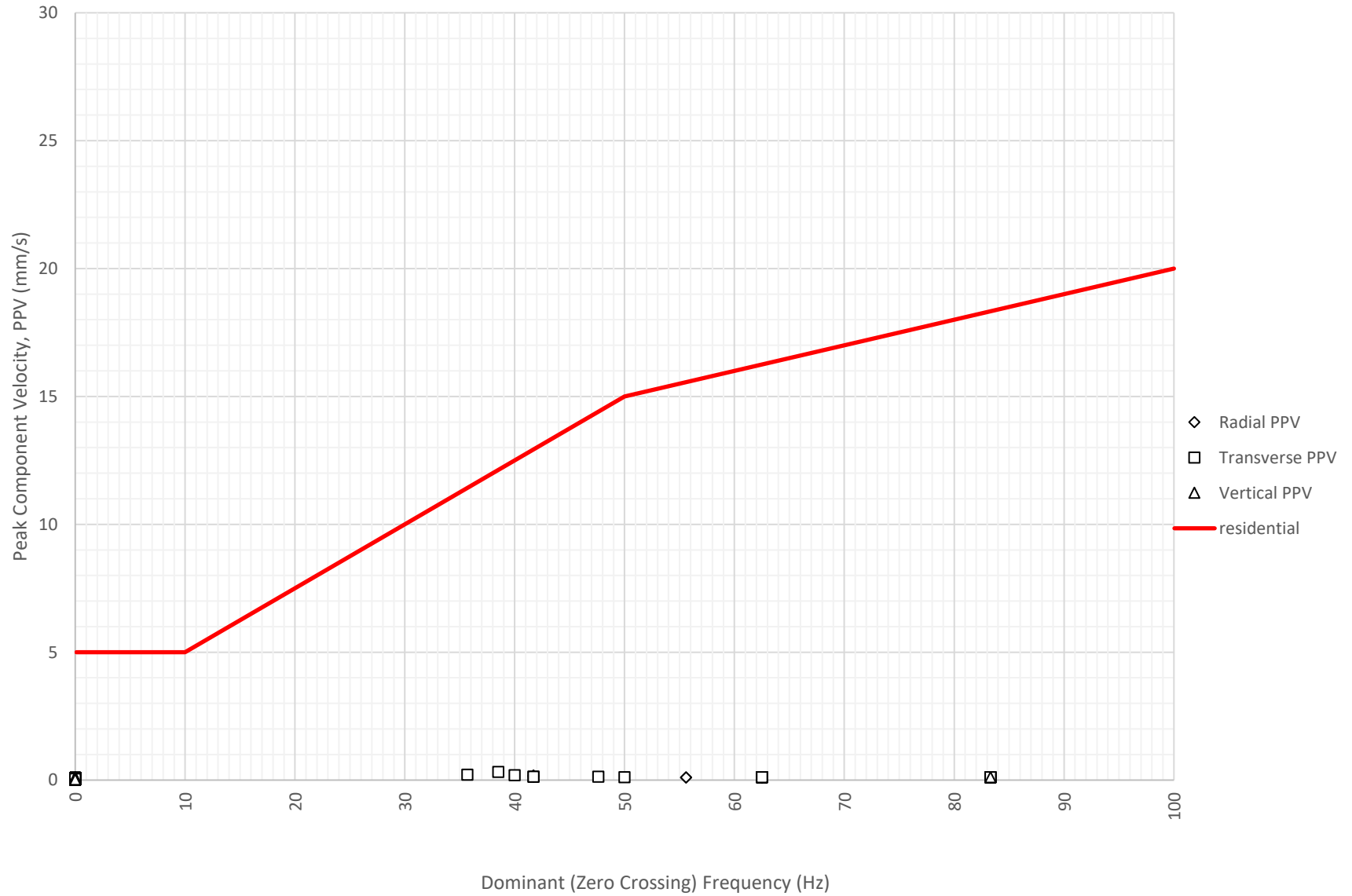
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 4-09-2022



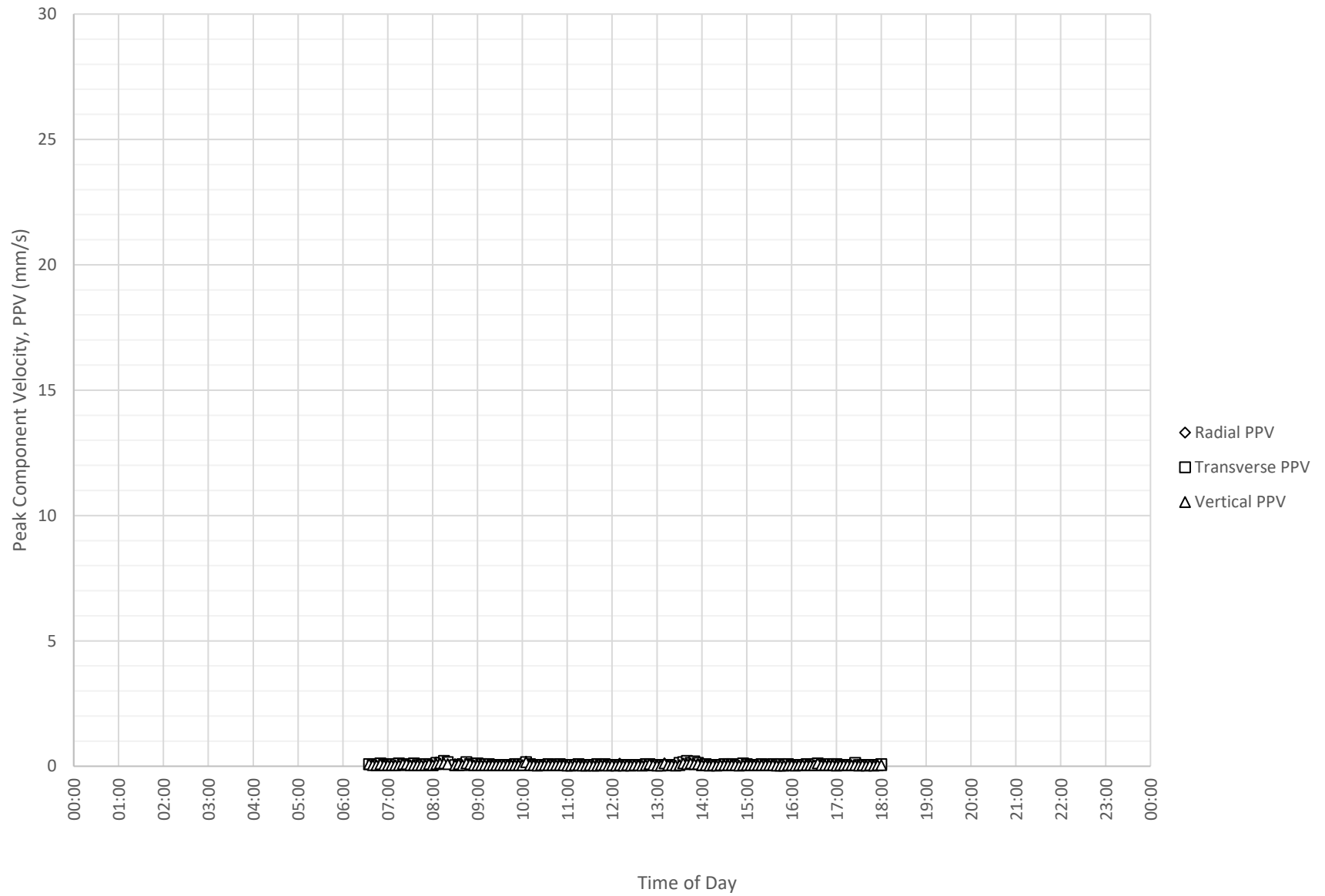
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 5-09-2022



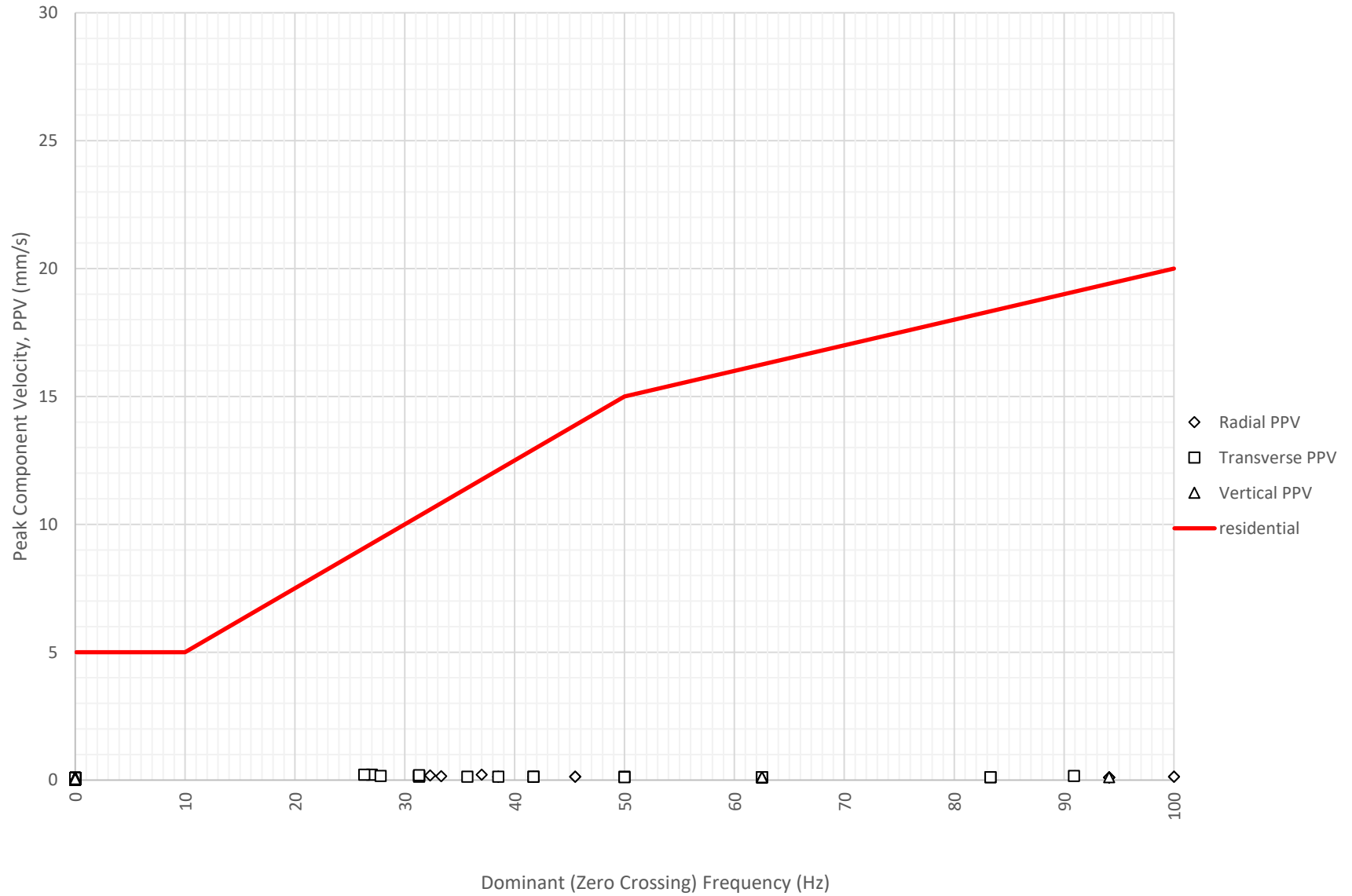
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 5-09-2022



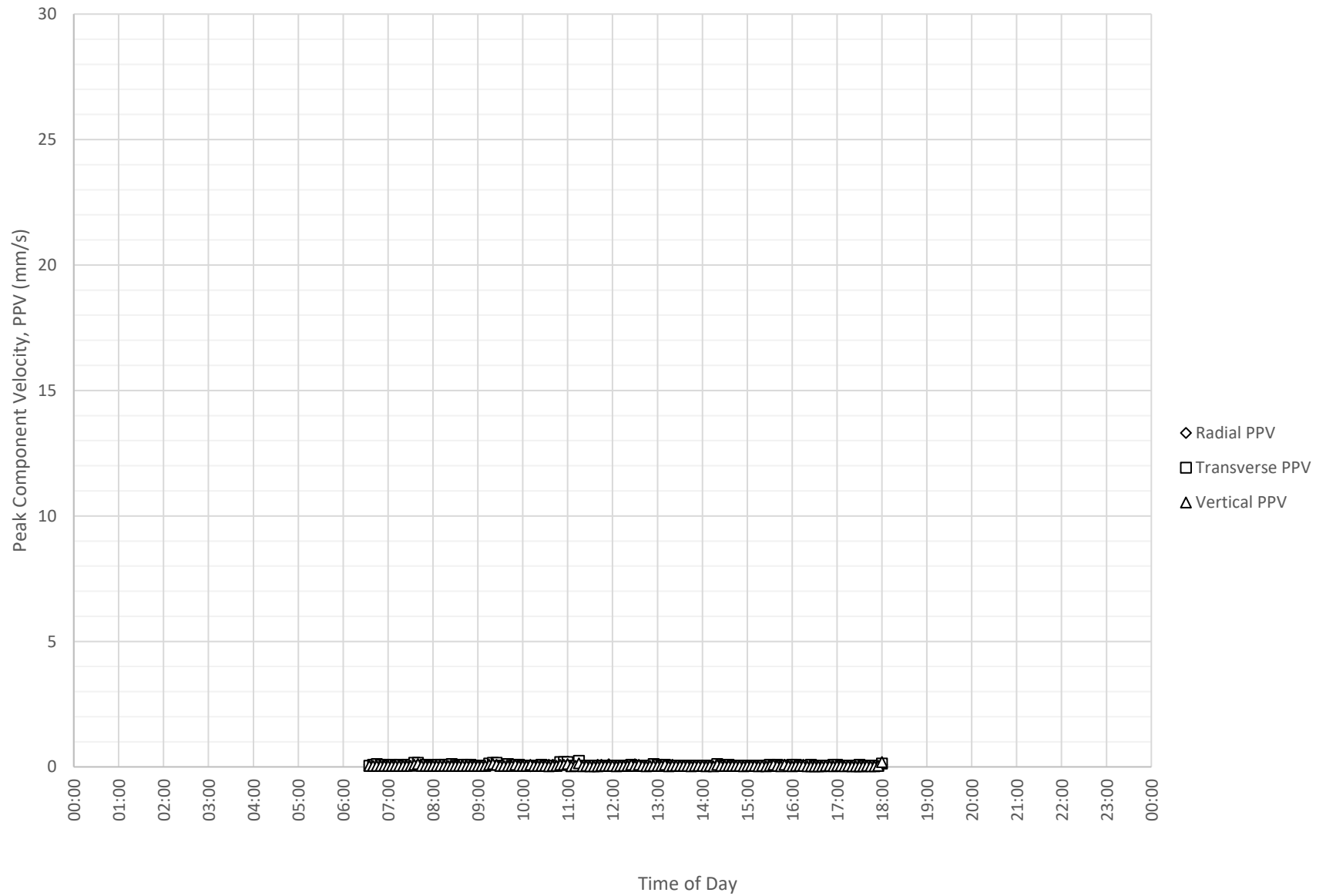
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 6-09-2022



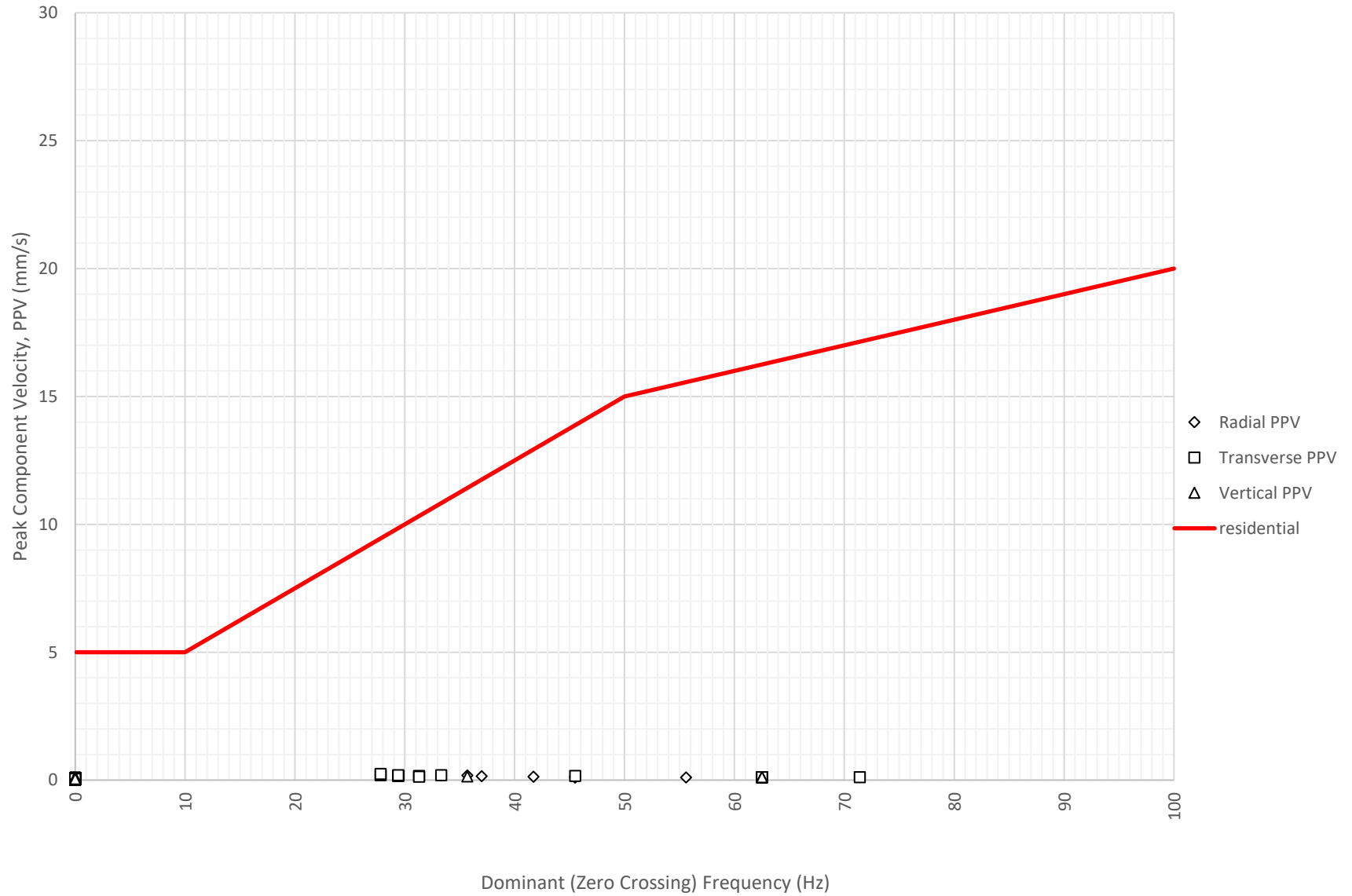
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 6-09-2022



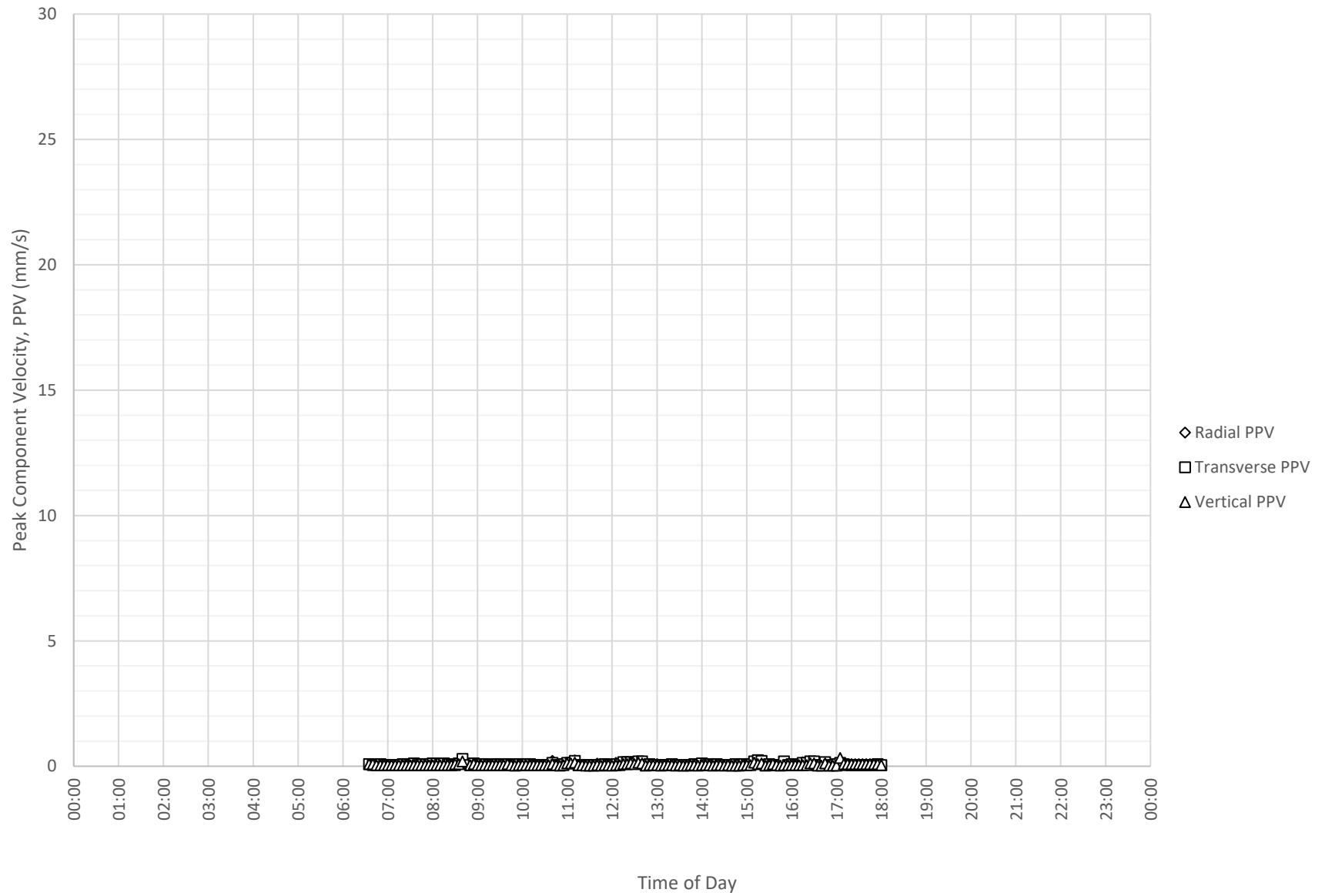
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 7-09-2022



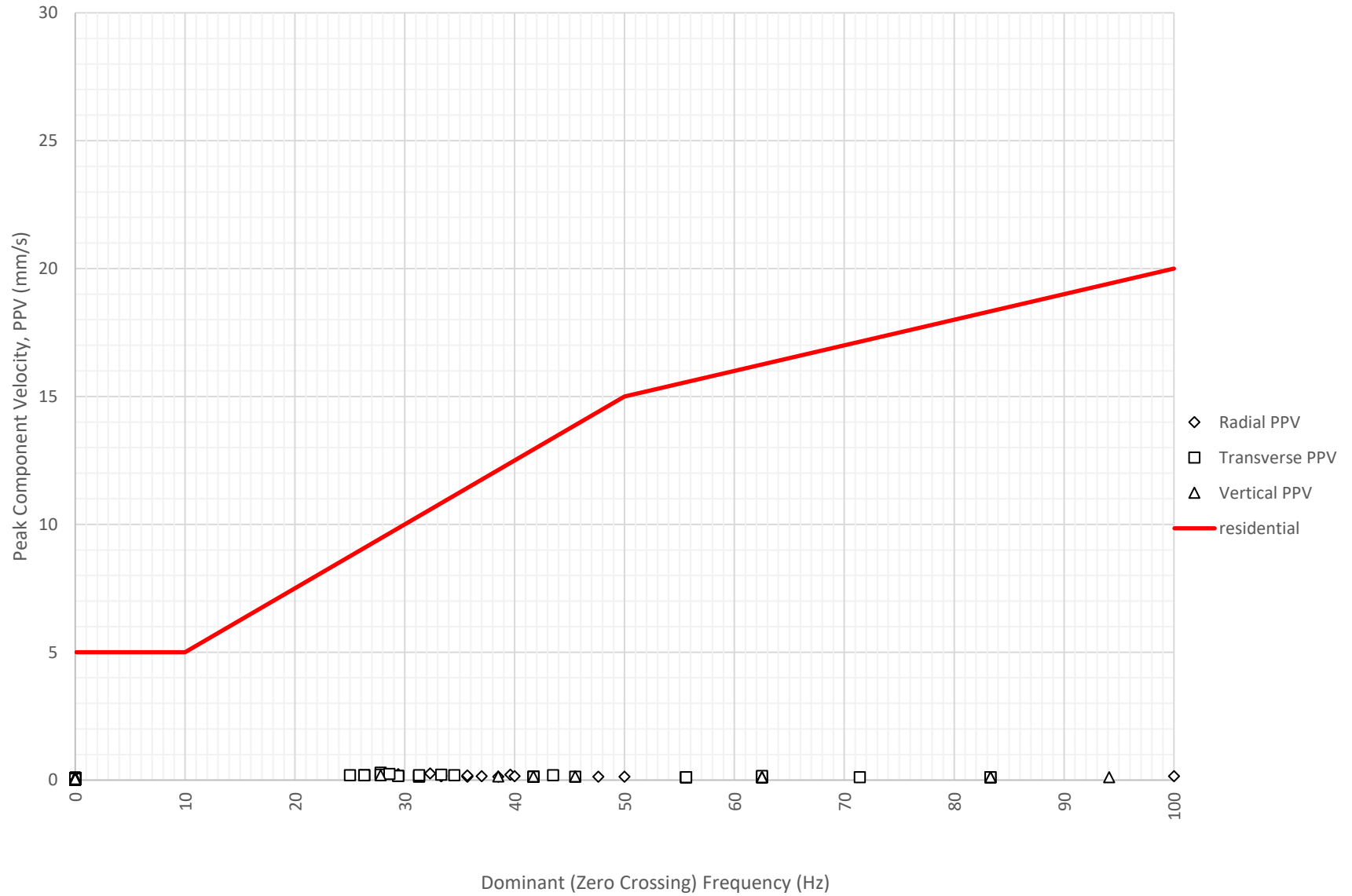
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 7-09-2022



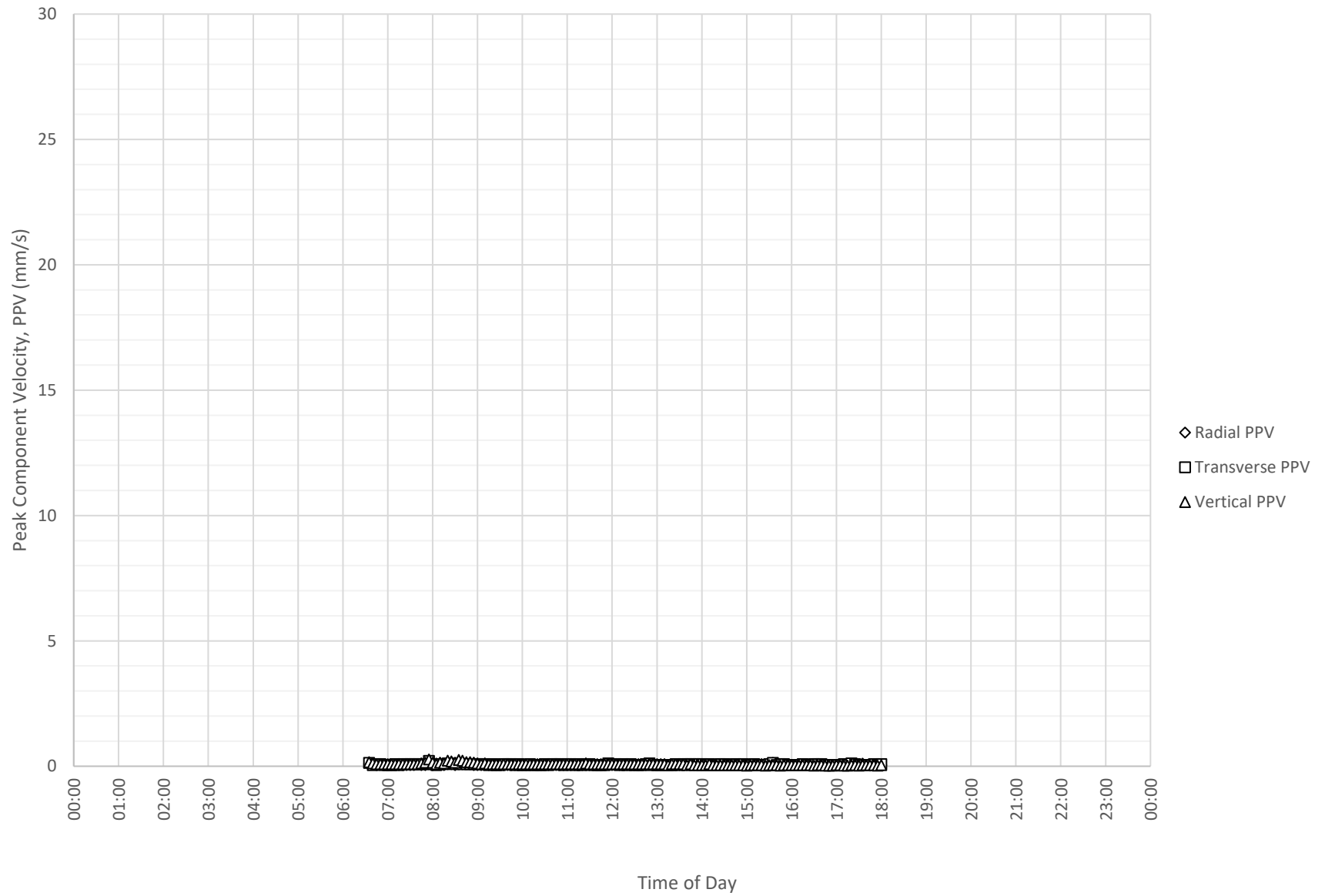
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 8-09-2022



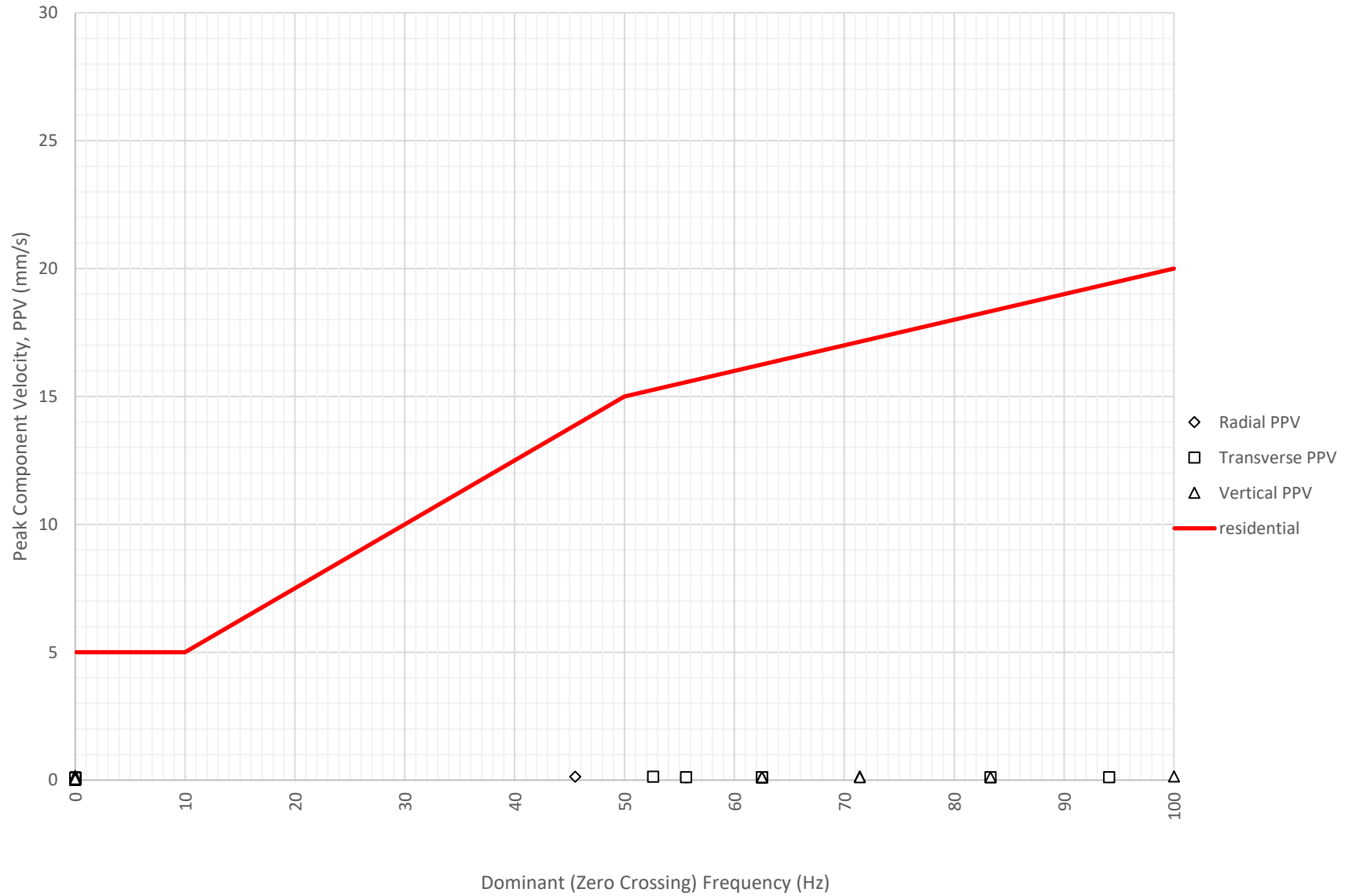
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 8-09-2022



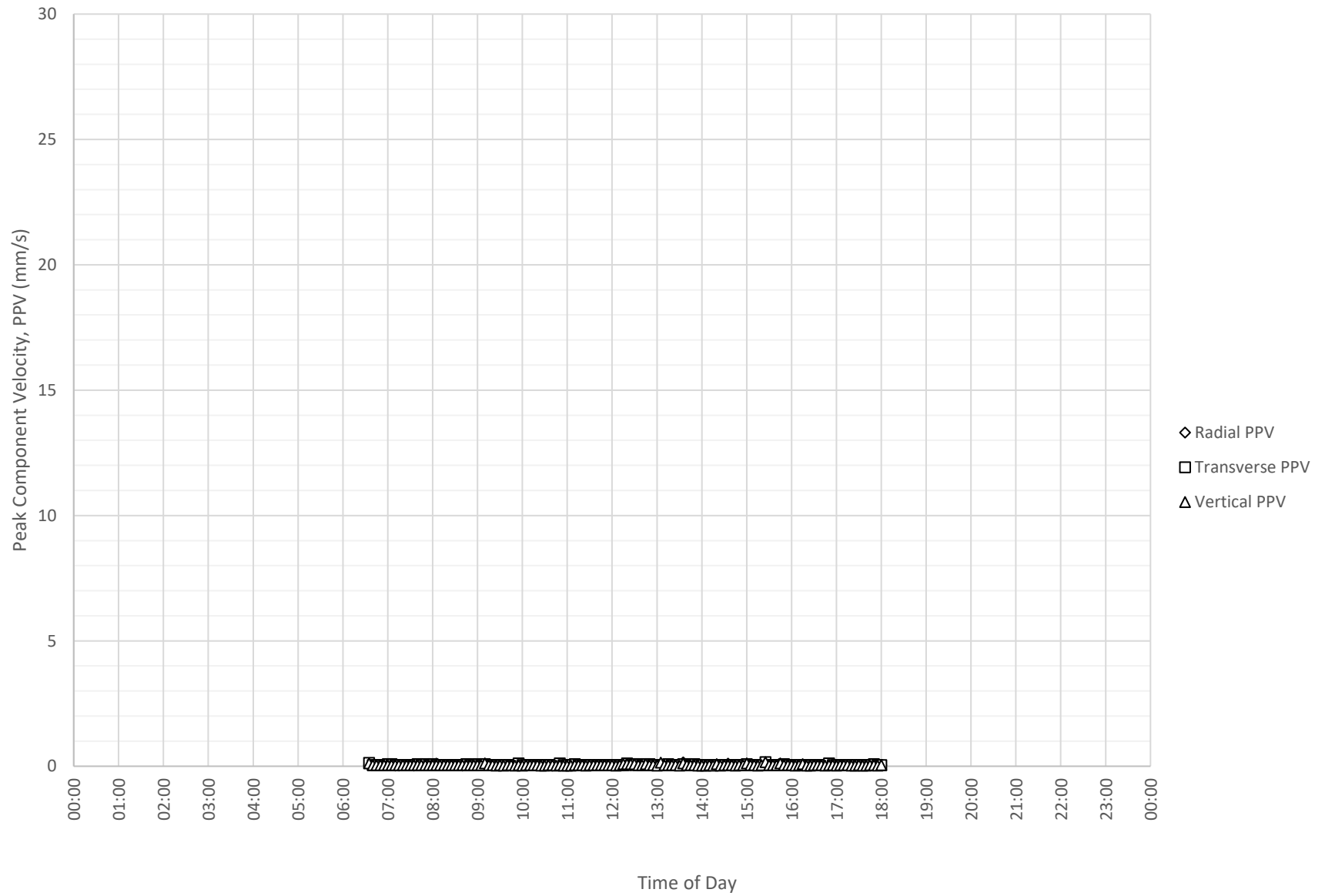
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 9-09-2022



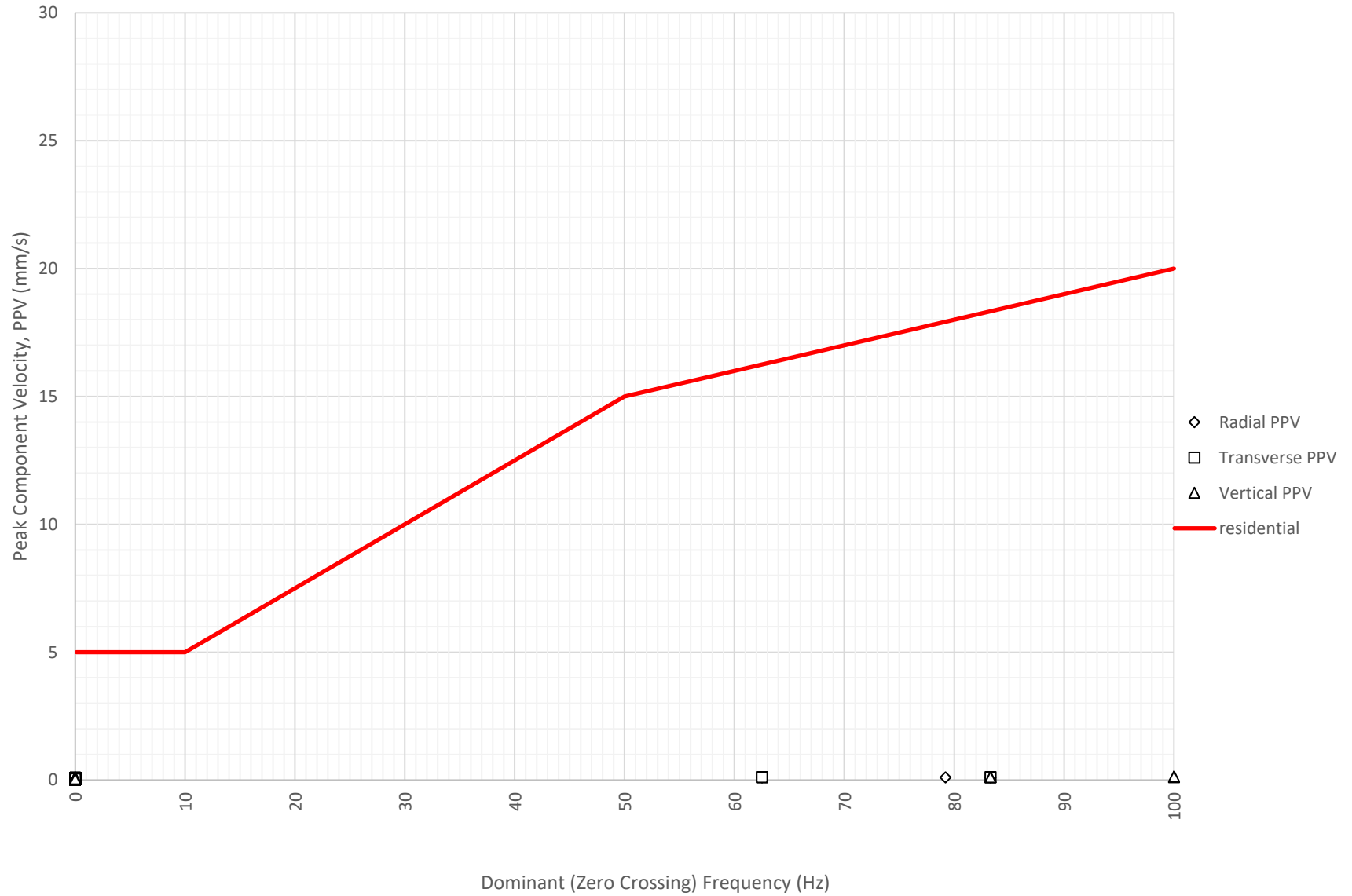
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 9-09-2022



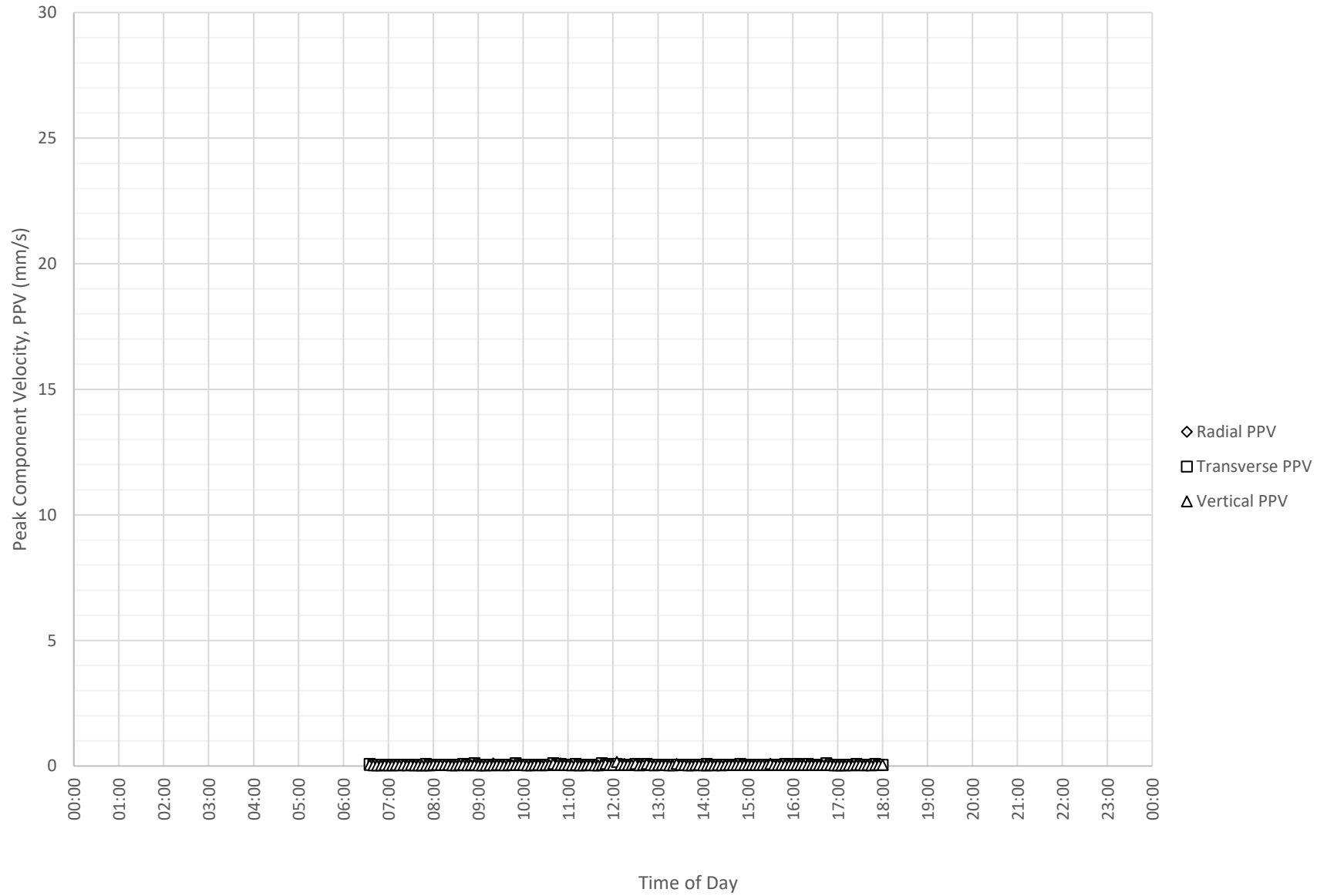
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 10-09-2022



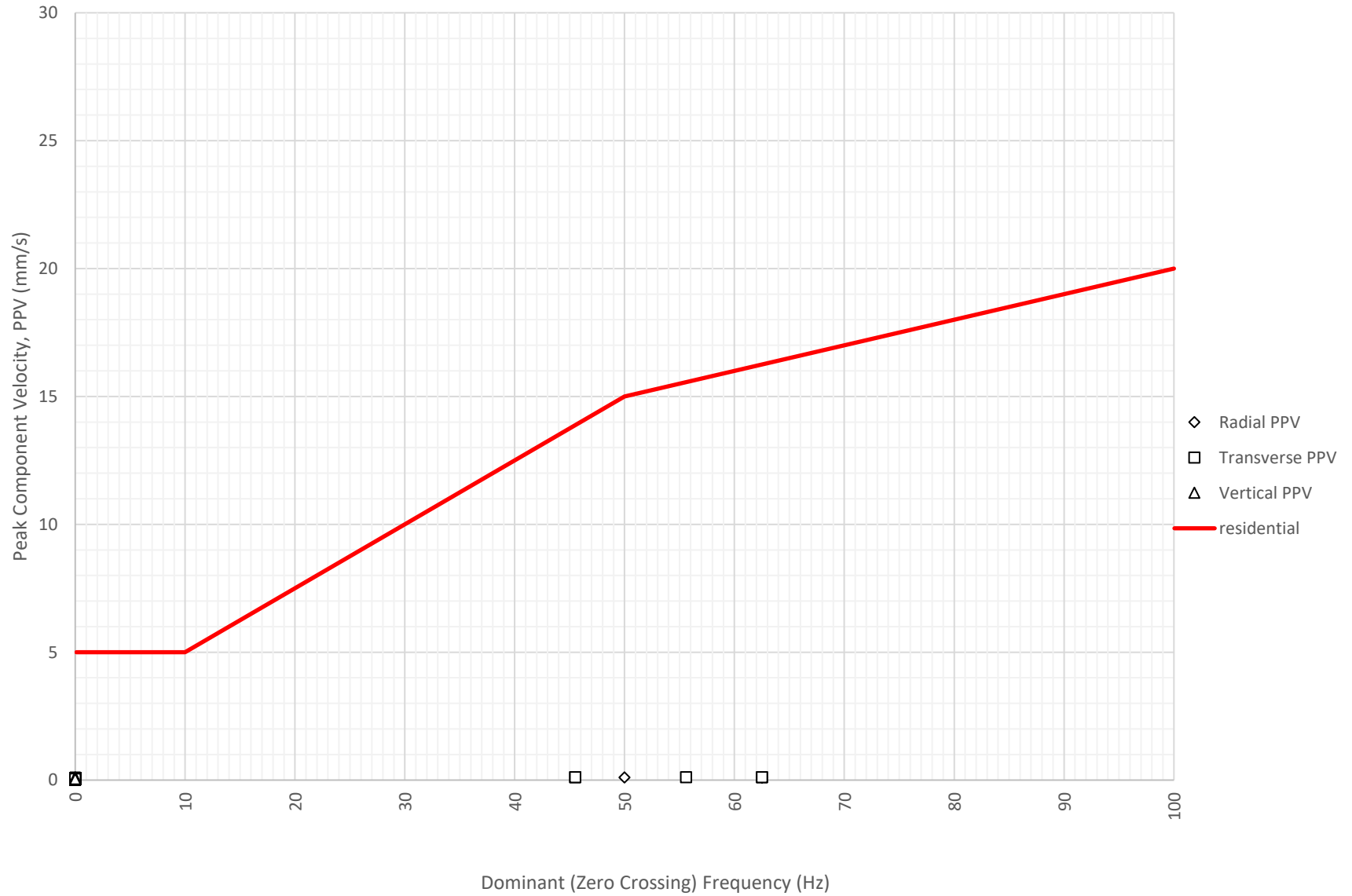
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 10-09-2022



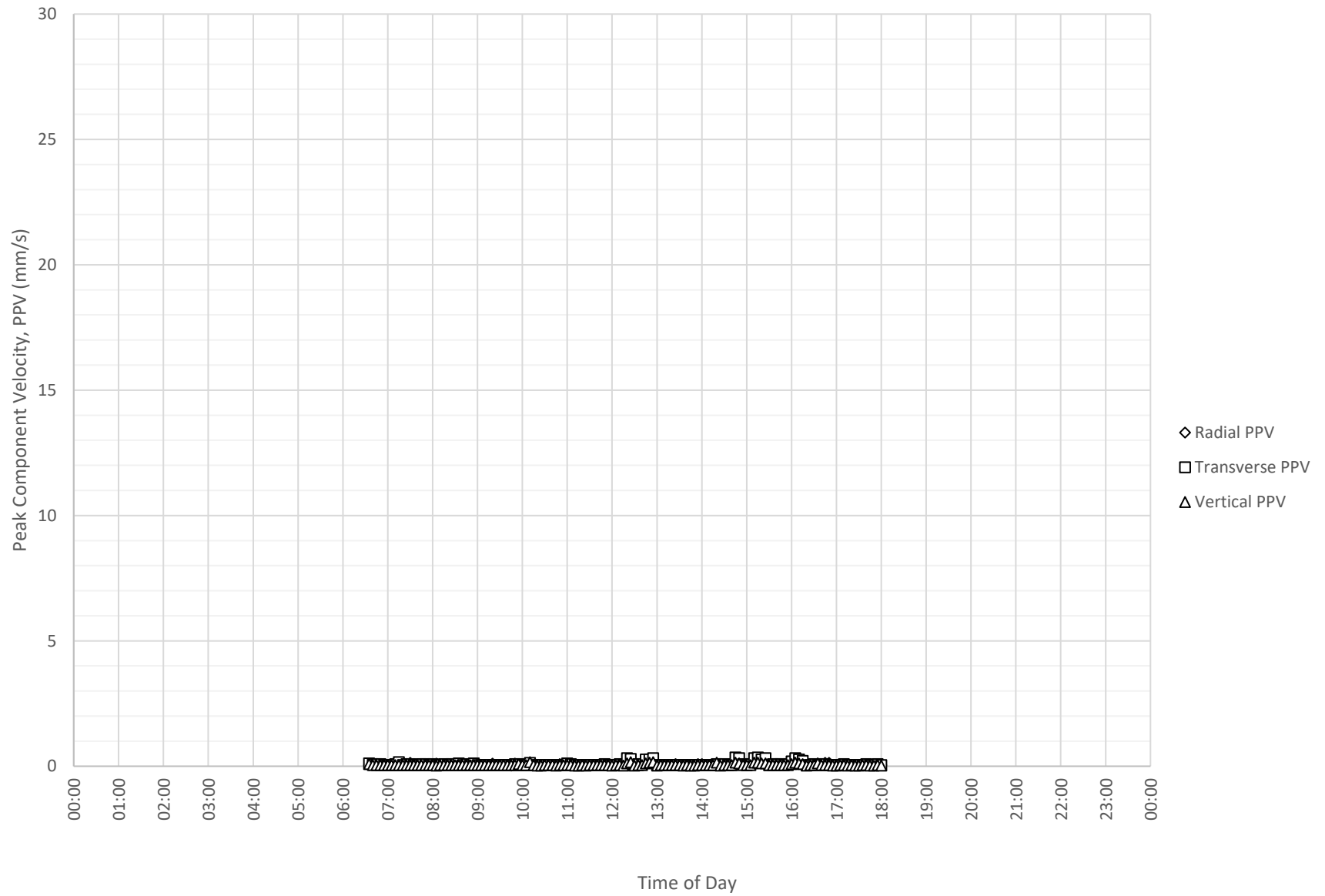
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 11-09-2022



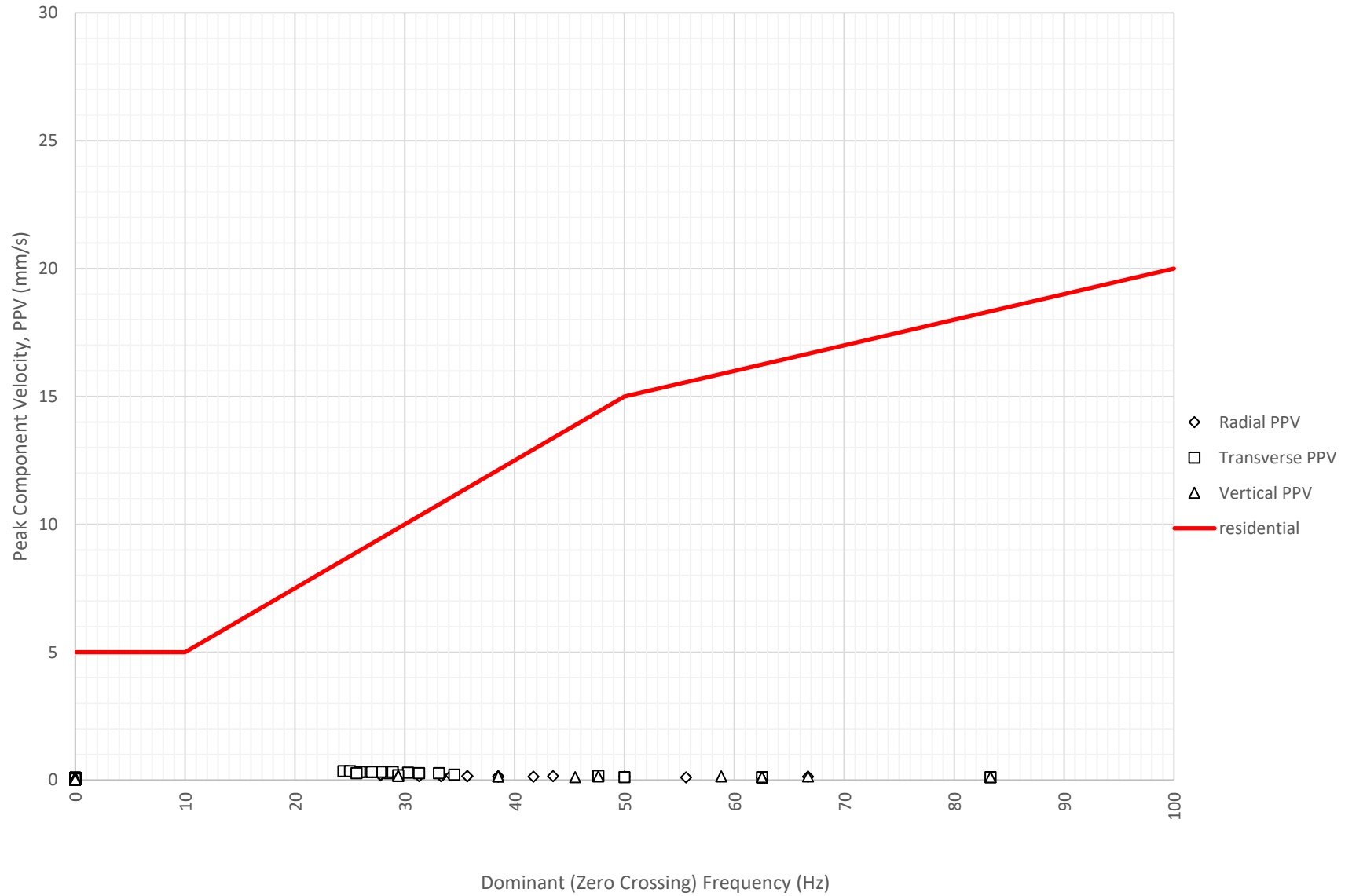
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 11-09-2022



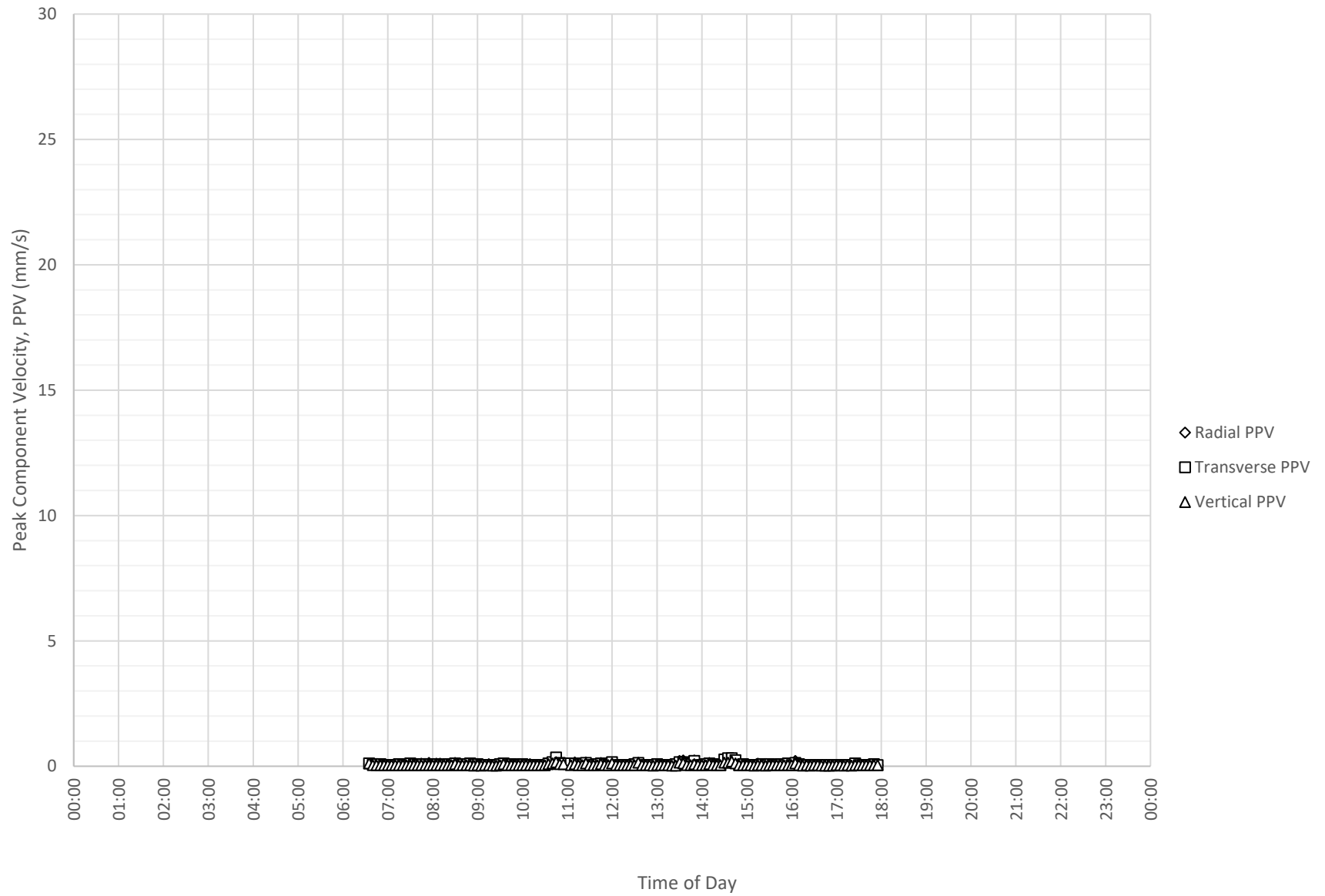
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 12-09-2022



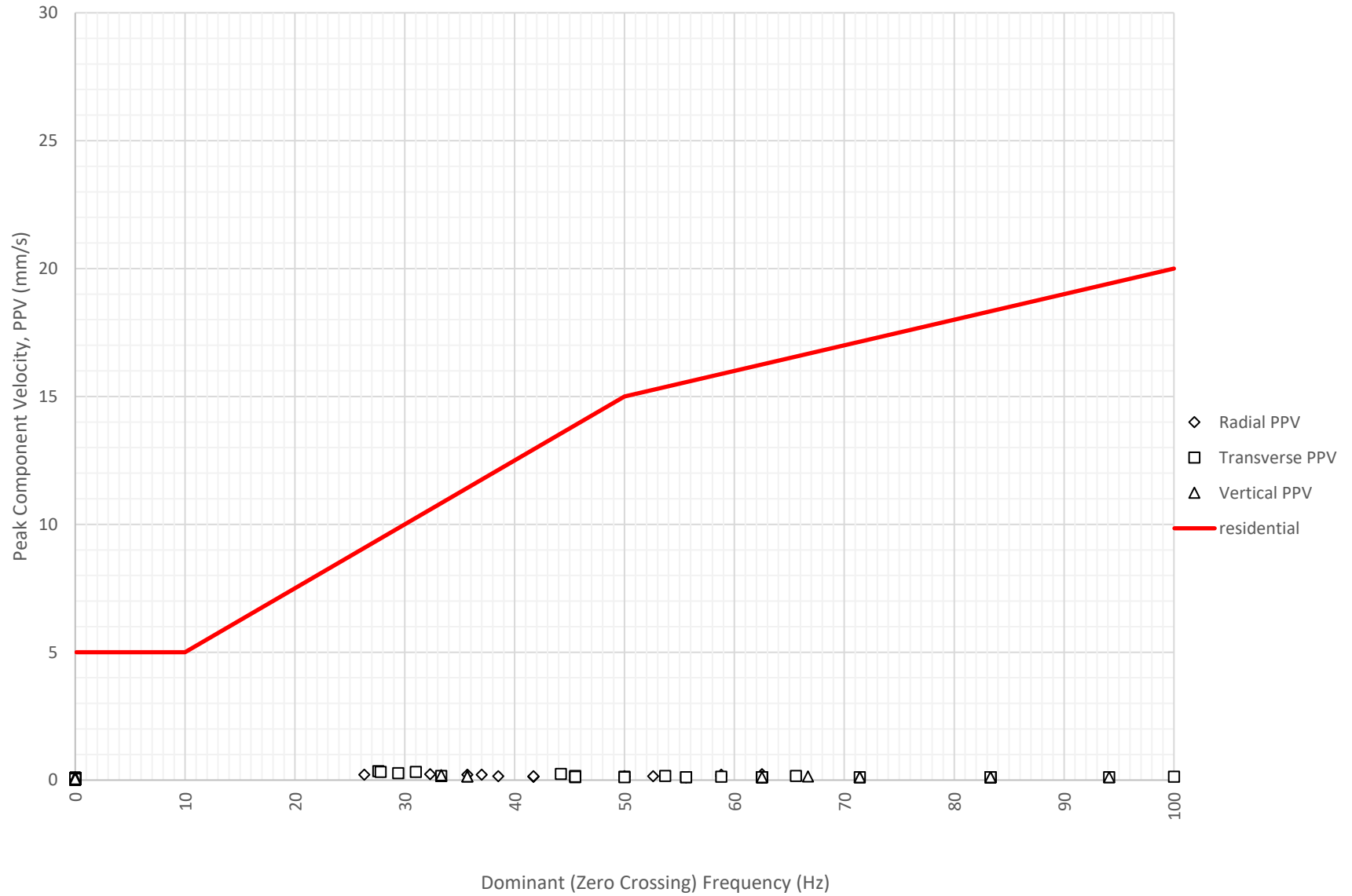
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 12-09-2022



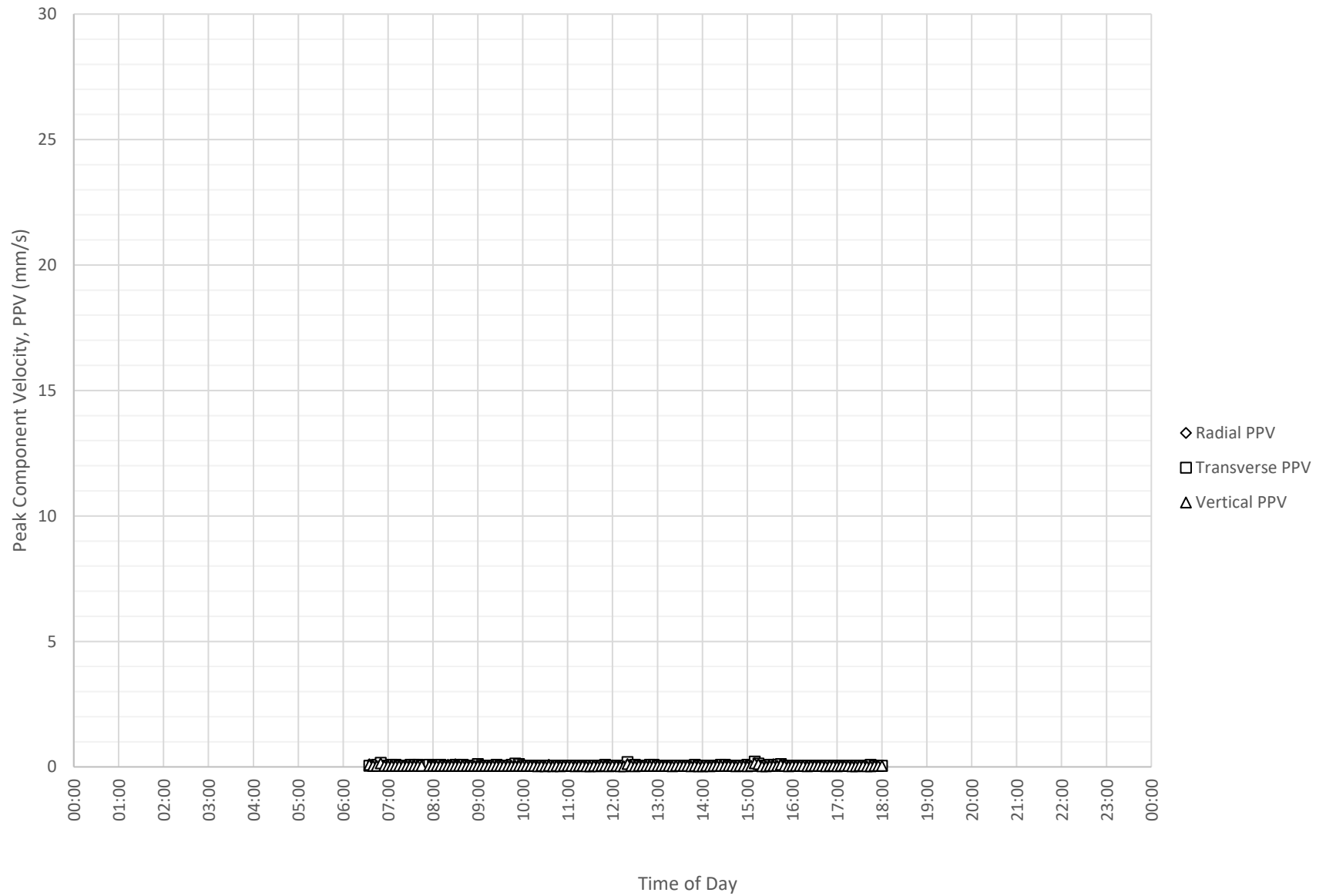
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 13-09-2022



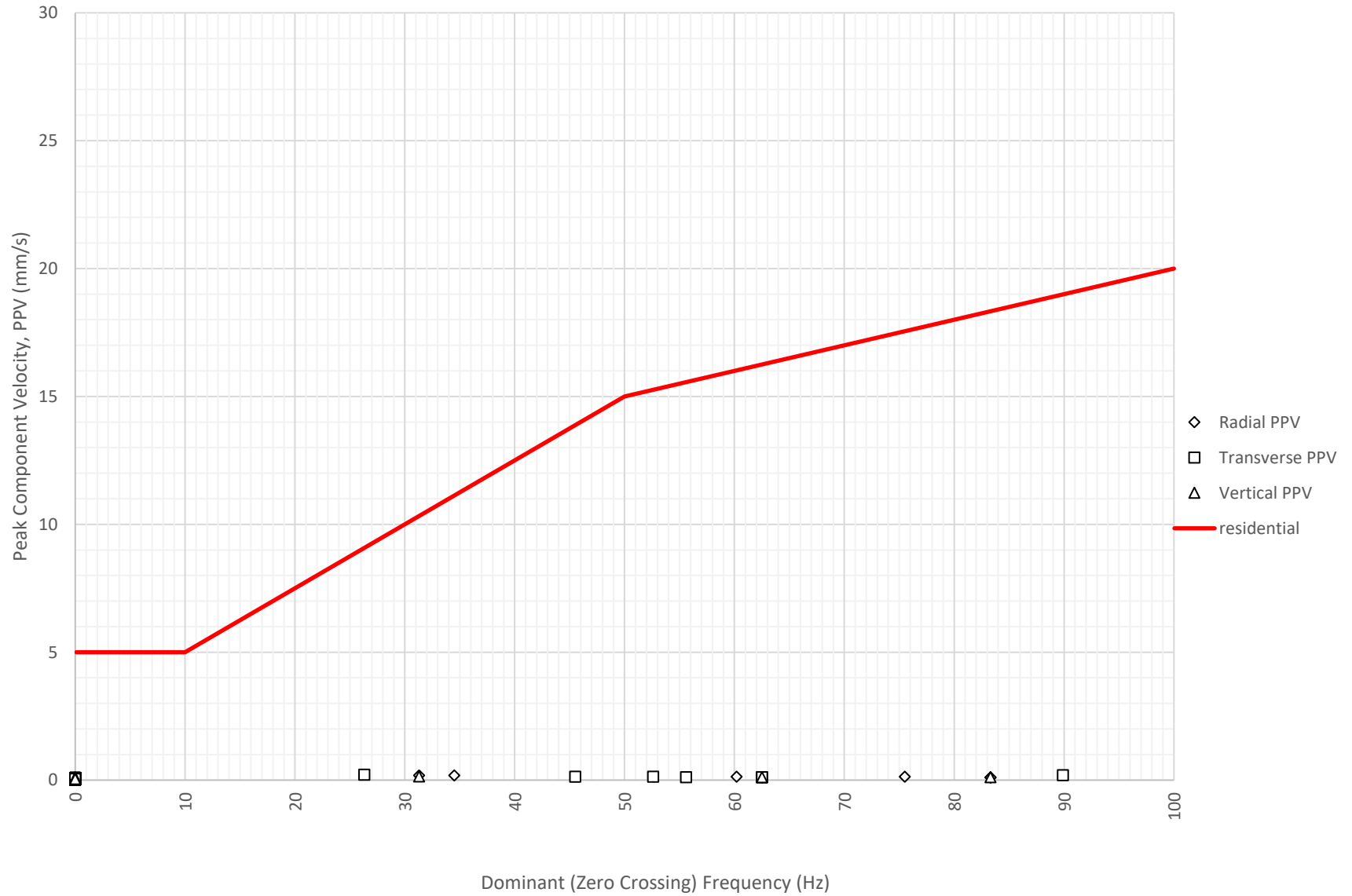
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 13-09-2022



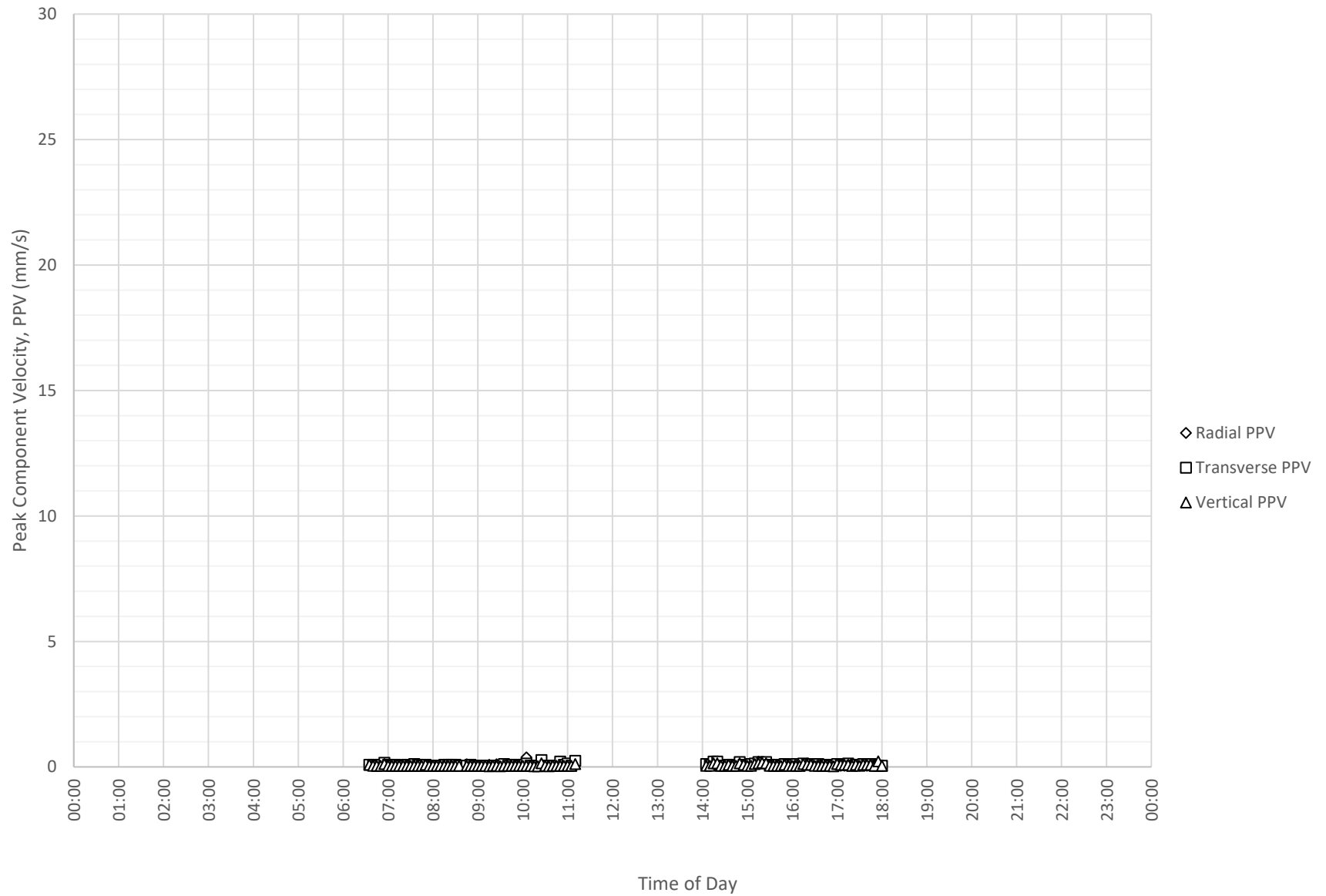
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 14-09-2022



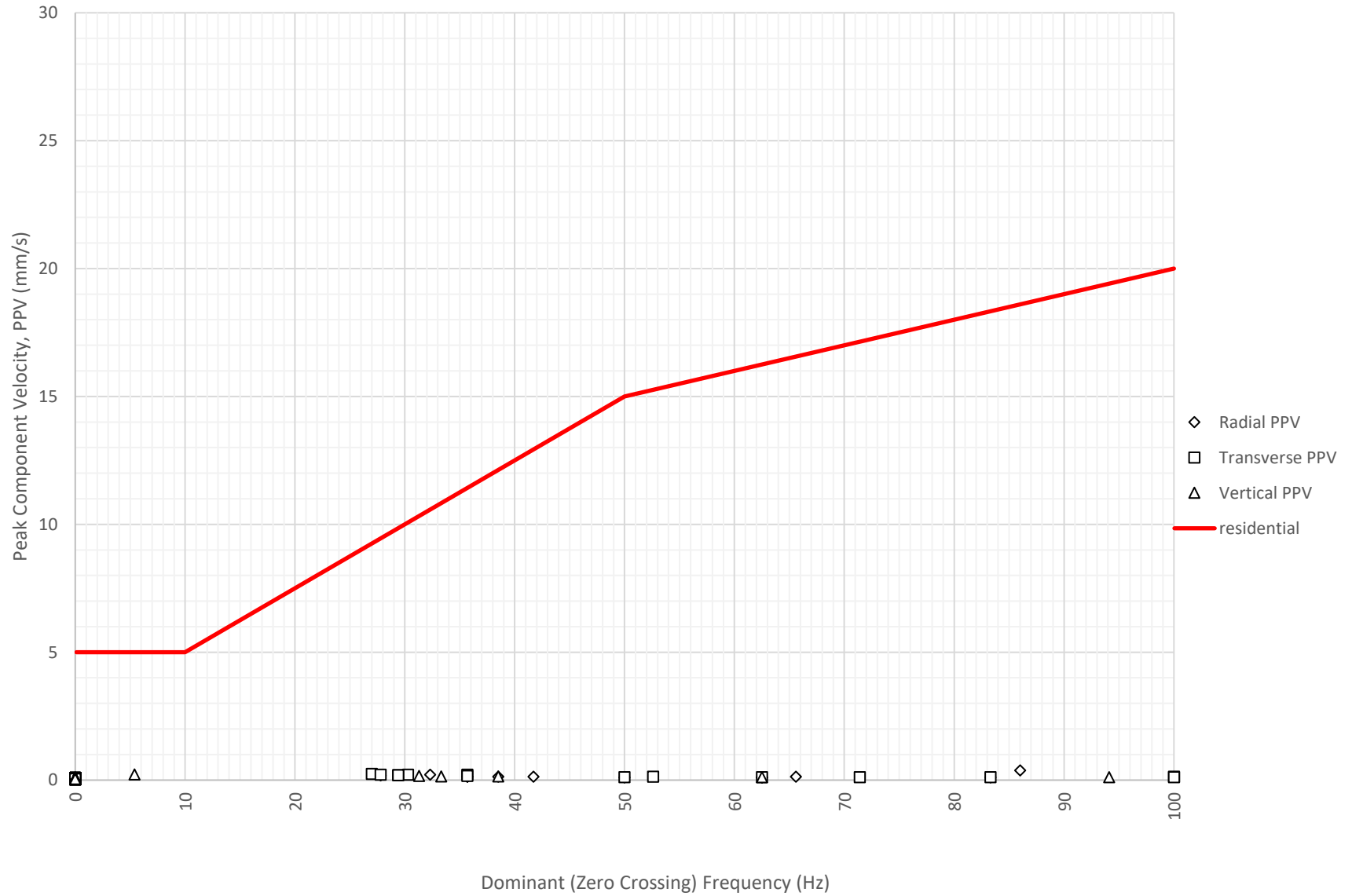
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 14-09-2022



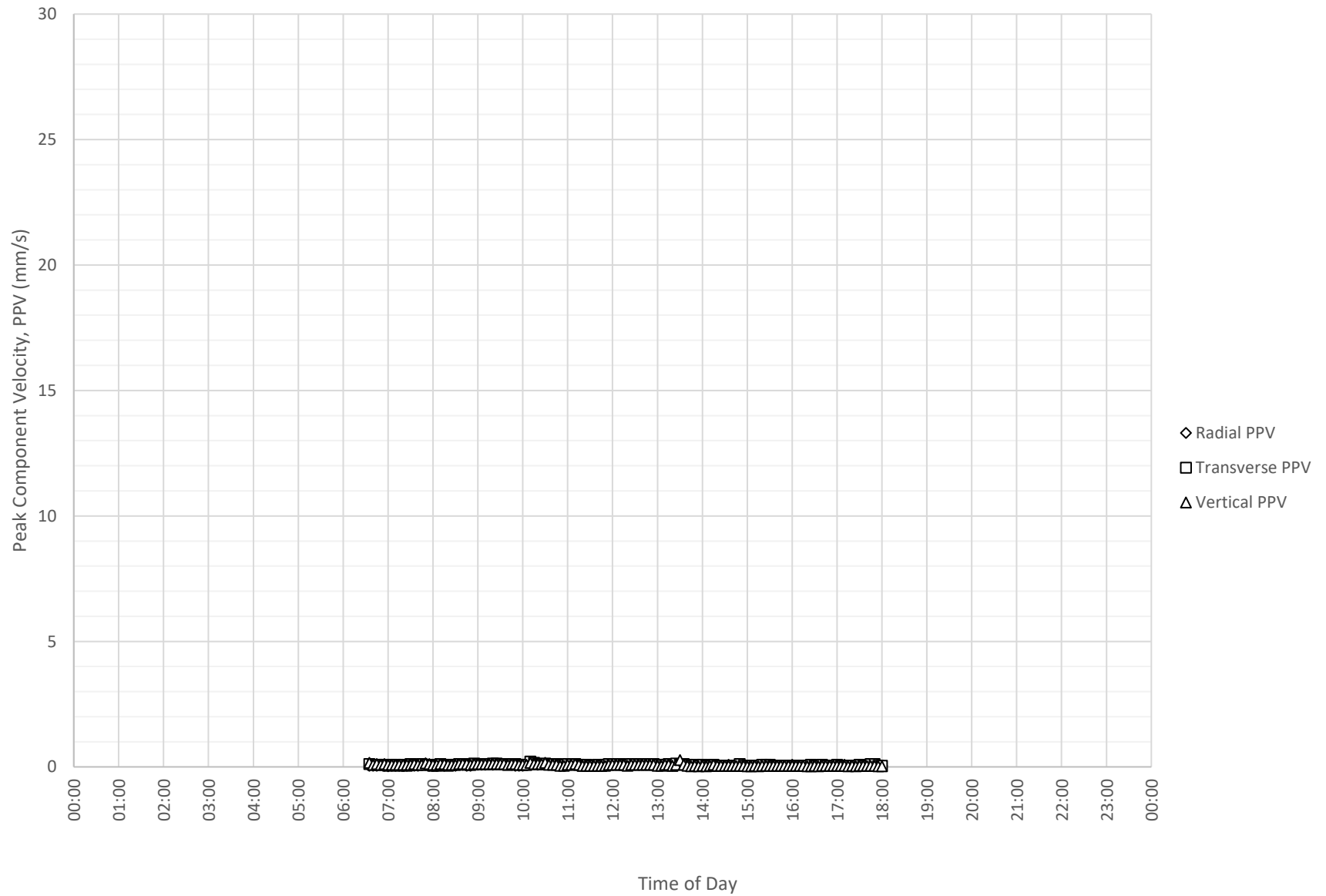
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 15-09-2022



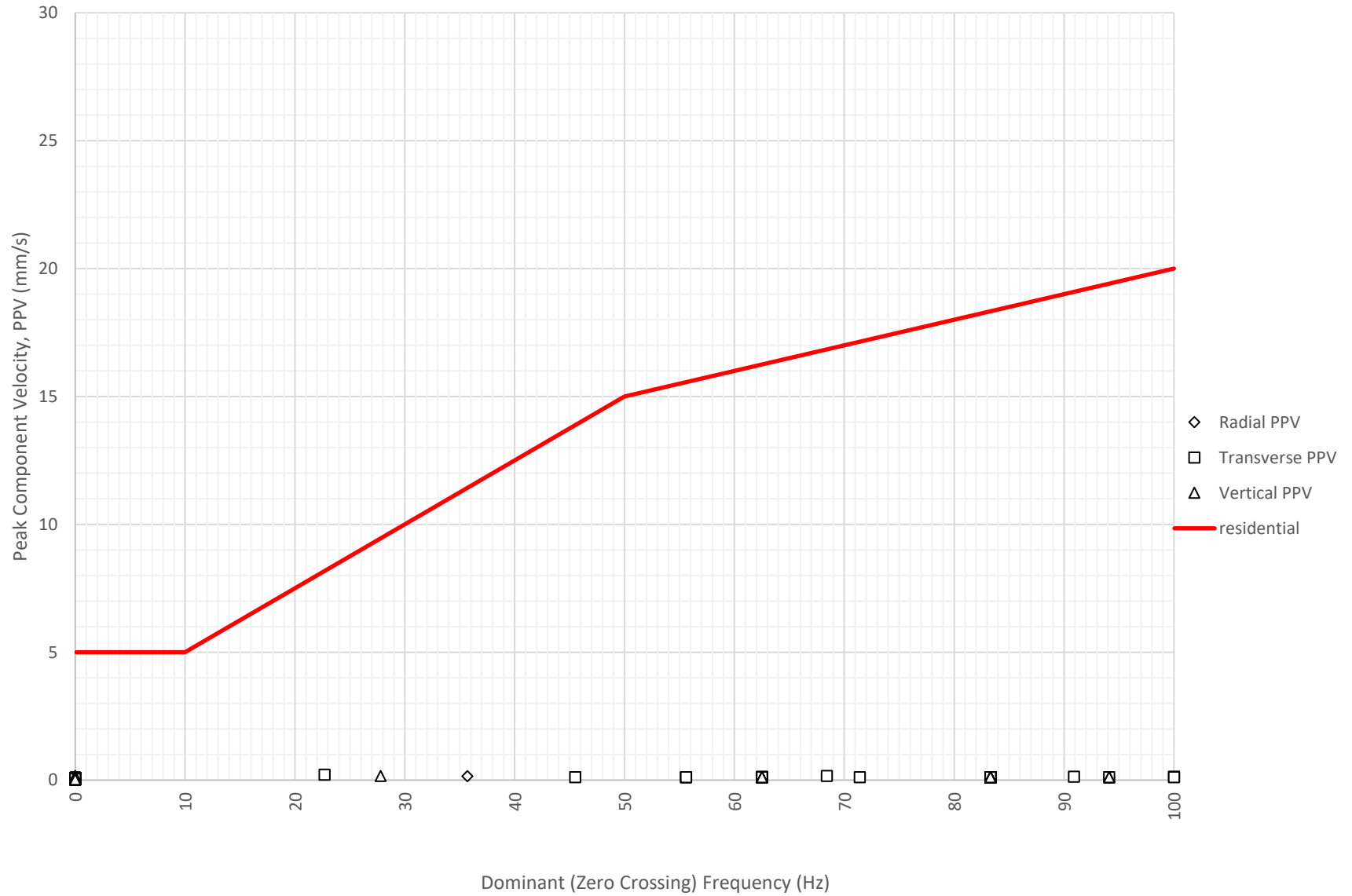
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 15-09-2022



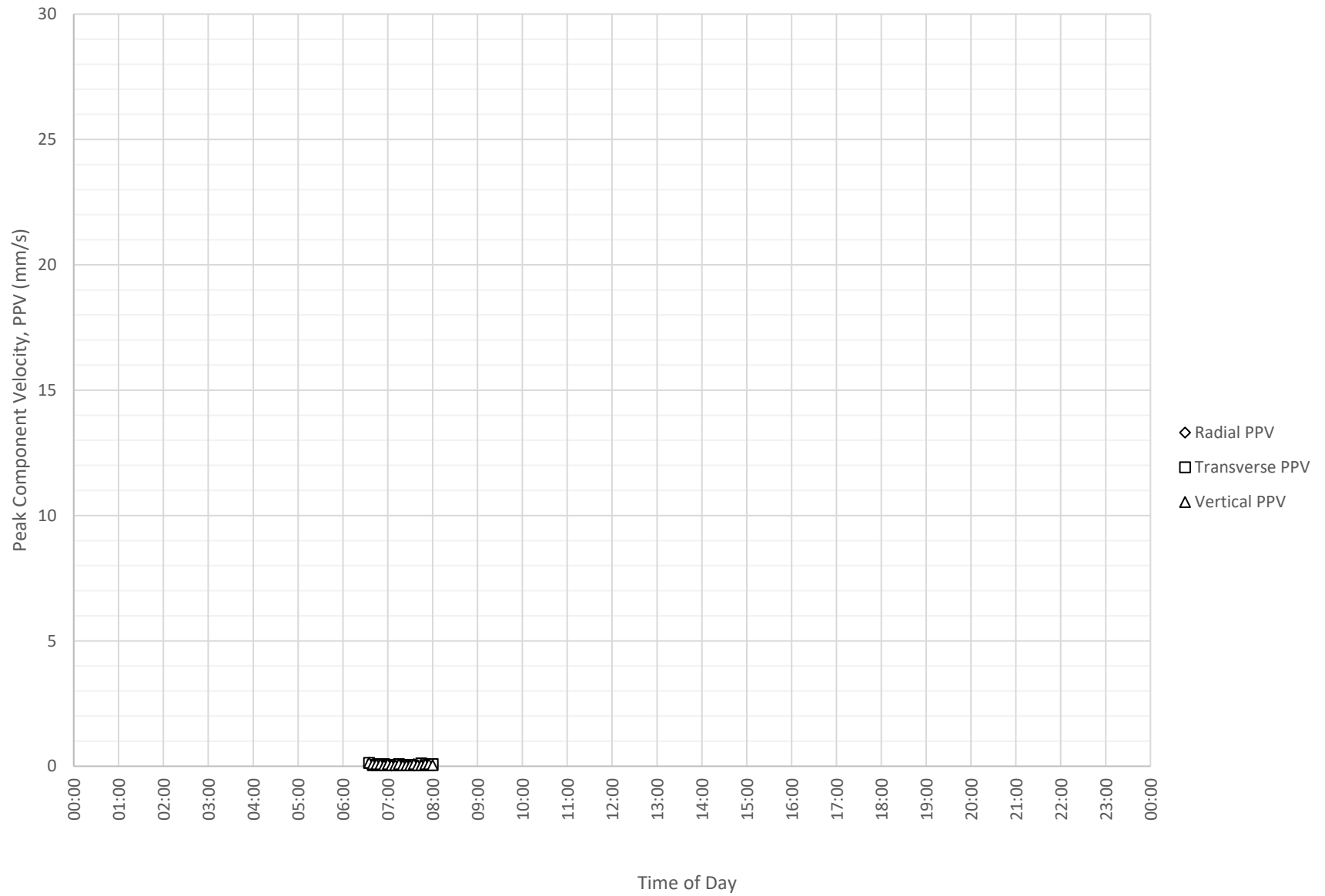
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 16-09-2022



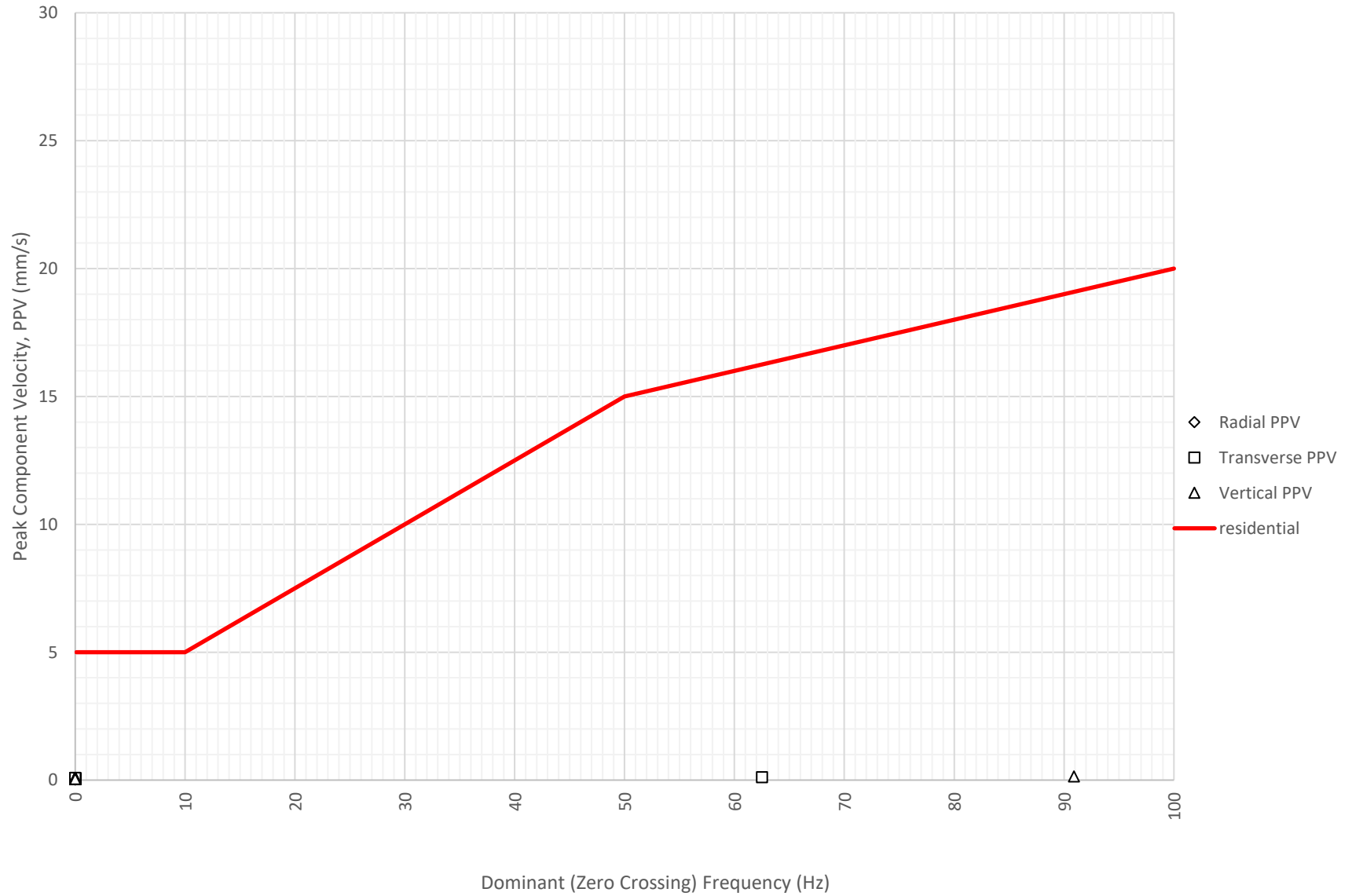
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 16-09-2022



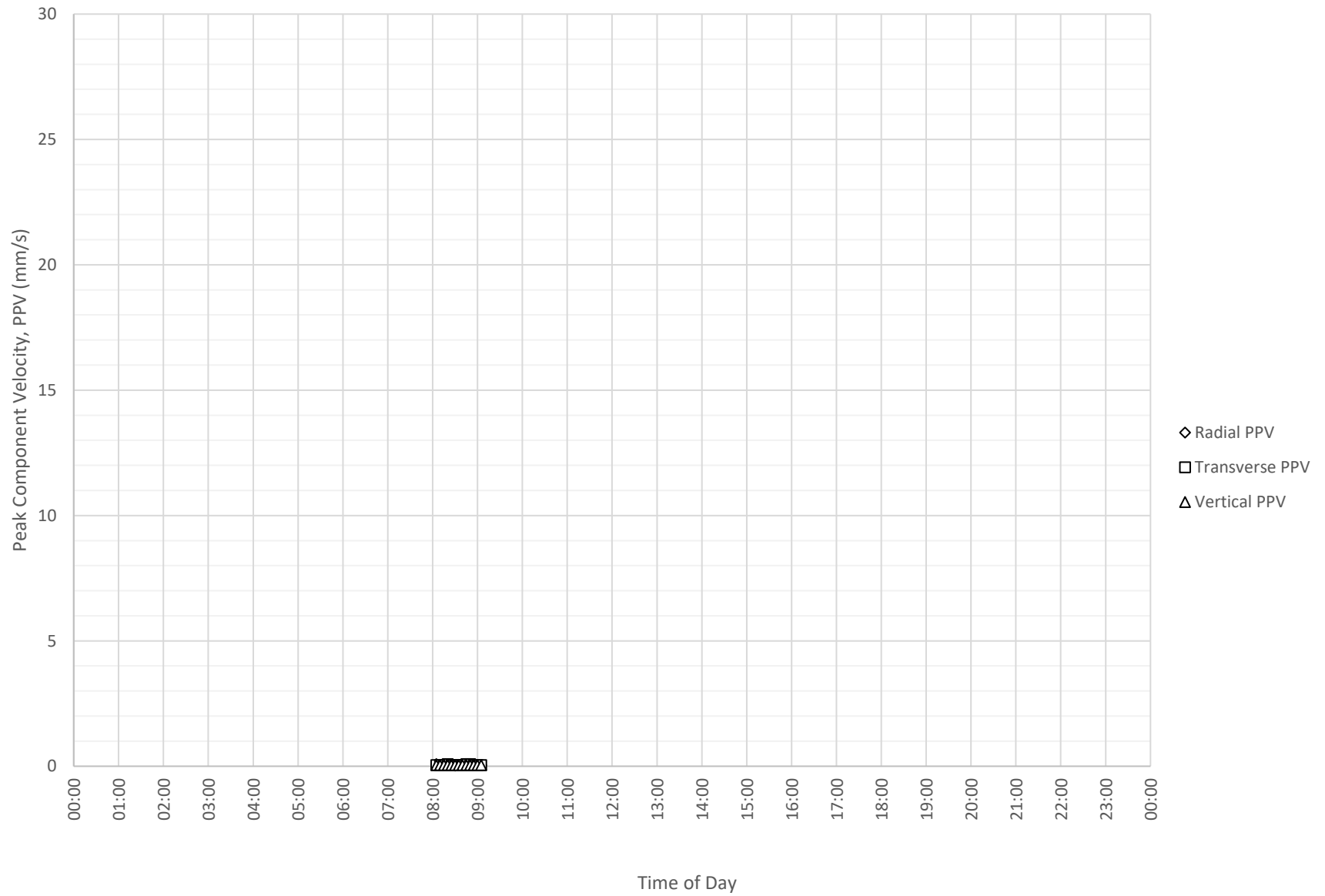
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 17-09-2022



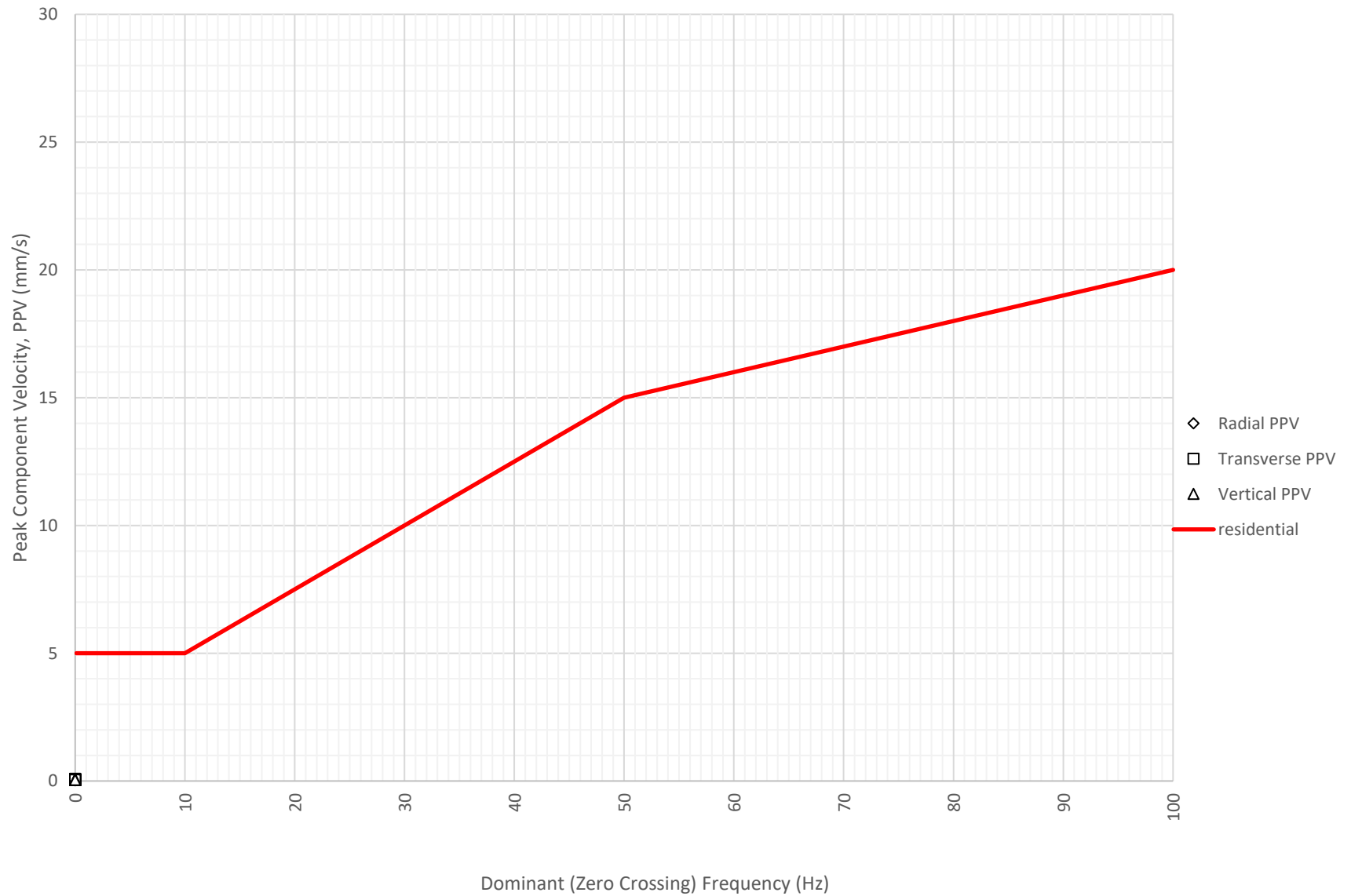
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 17-09-2022



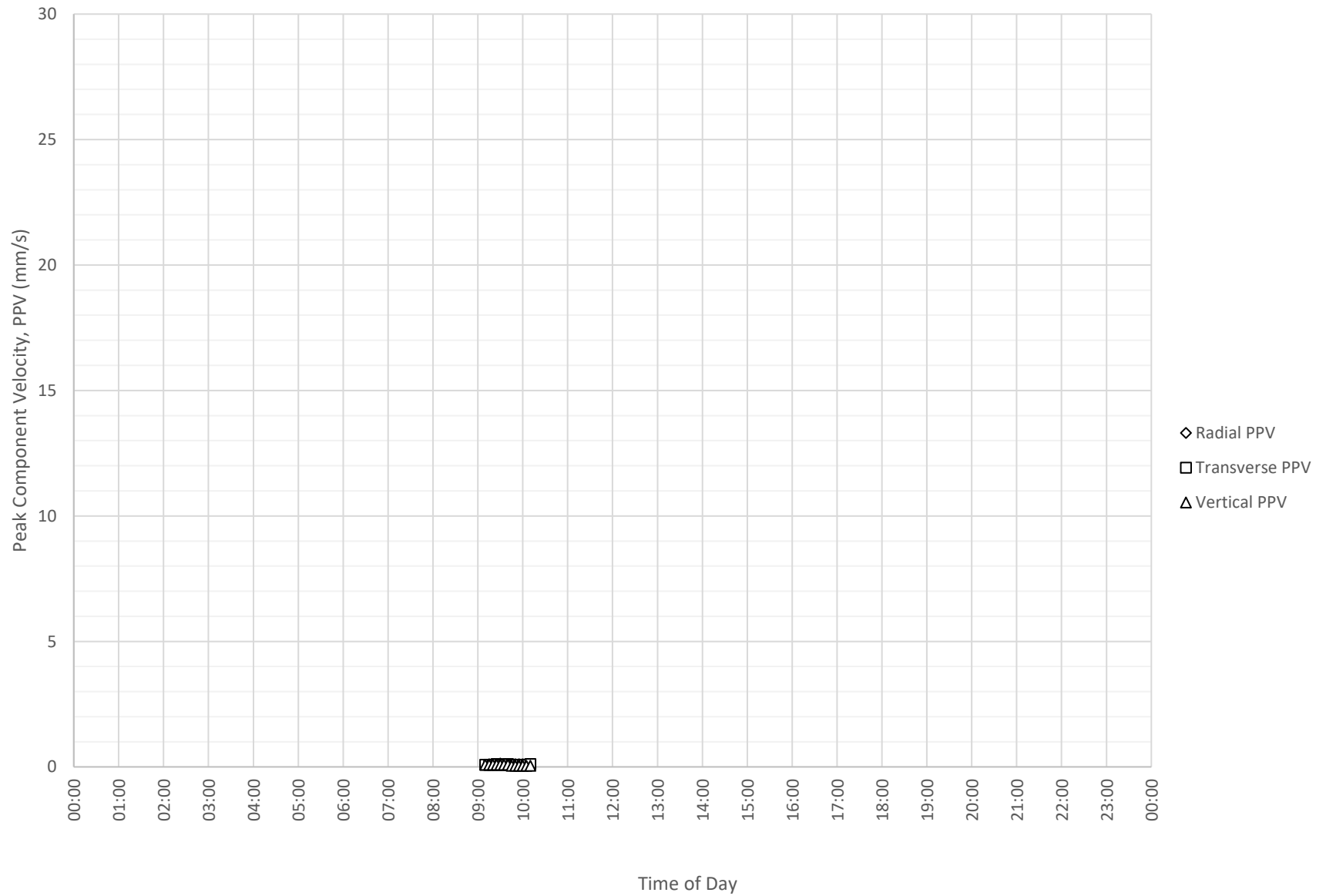
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 18-09-2022



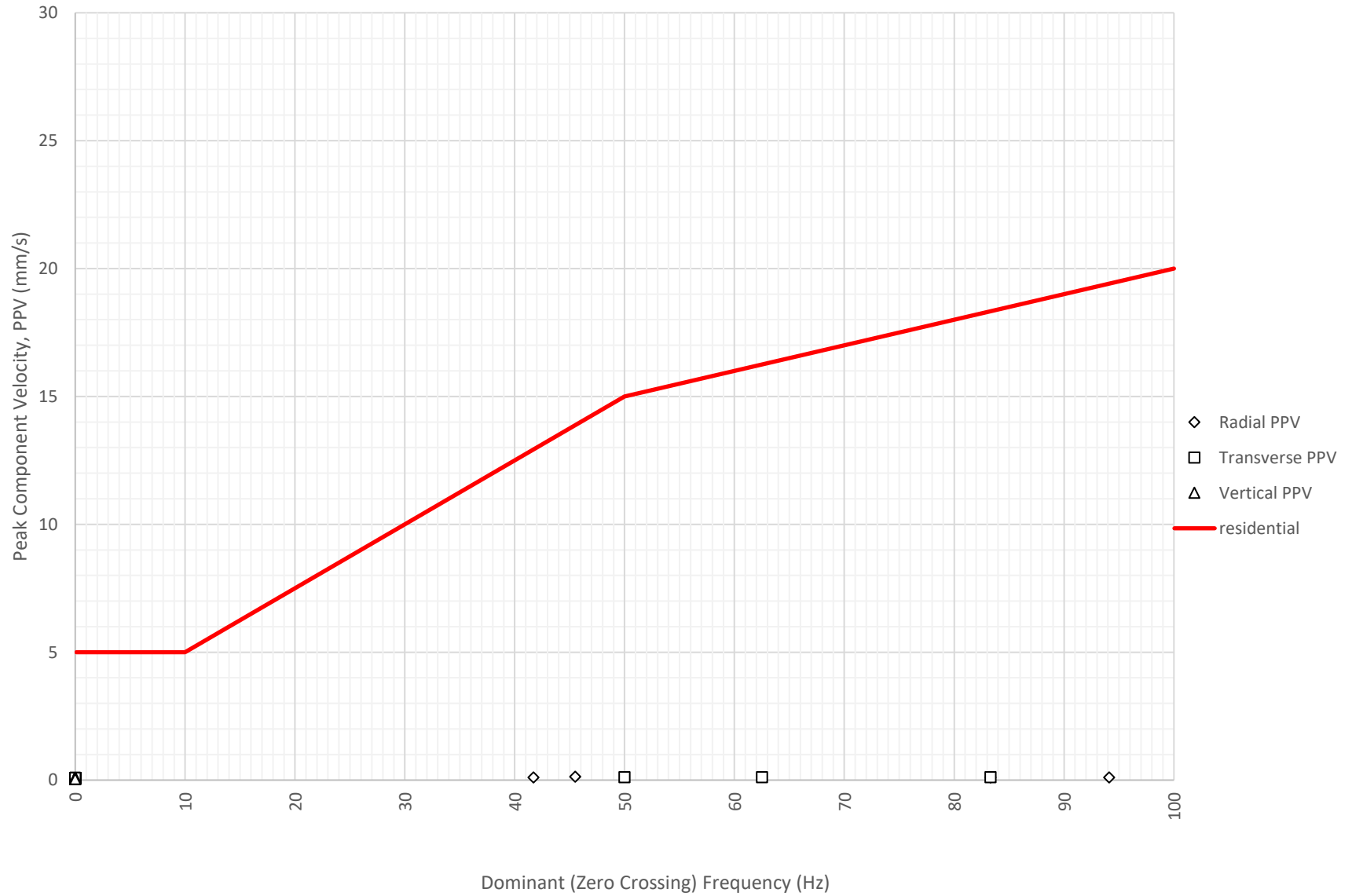
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 18-09-2022



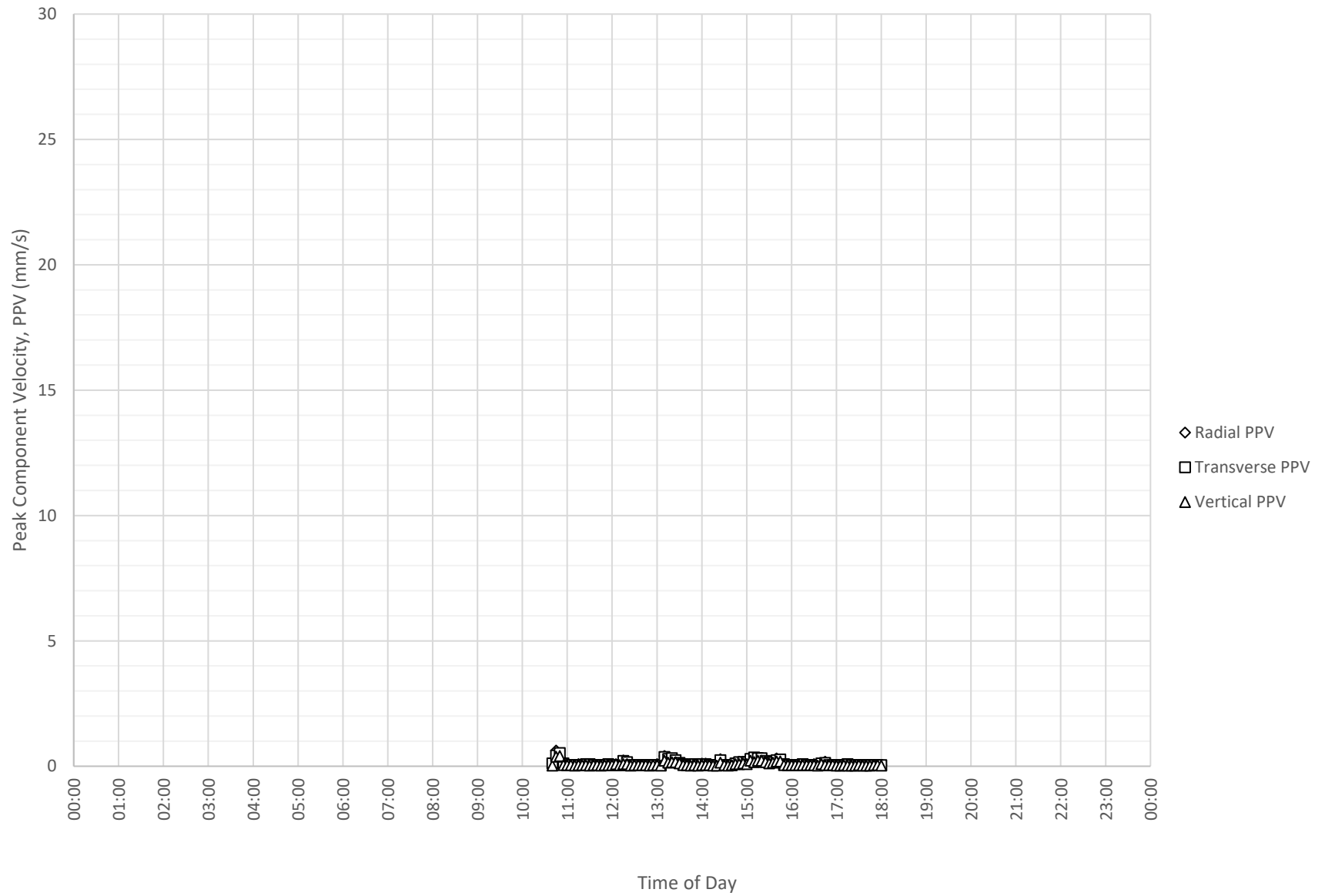
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 19-09-2022



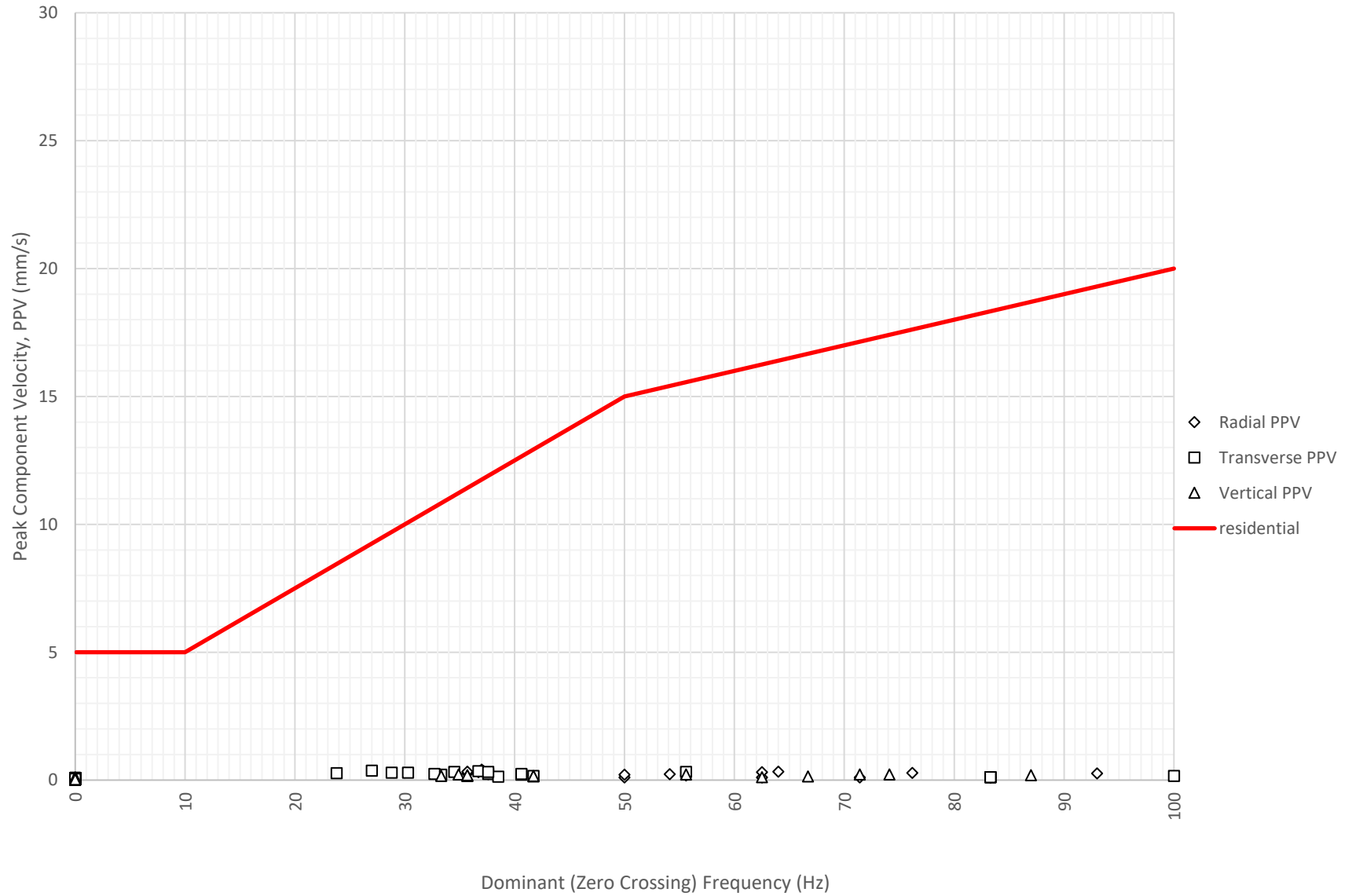
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 19-09-2022



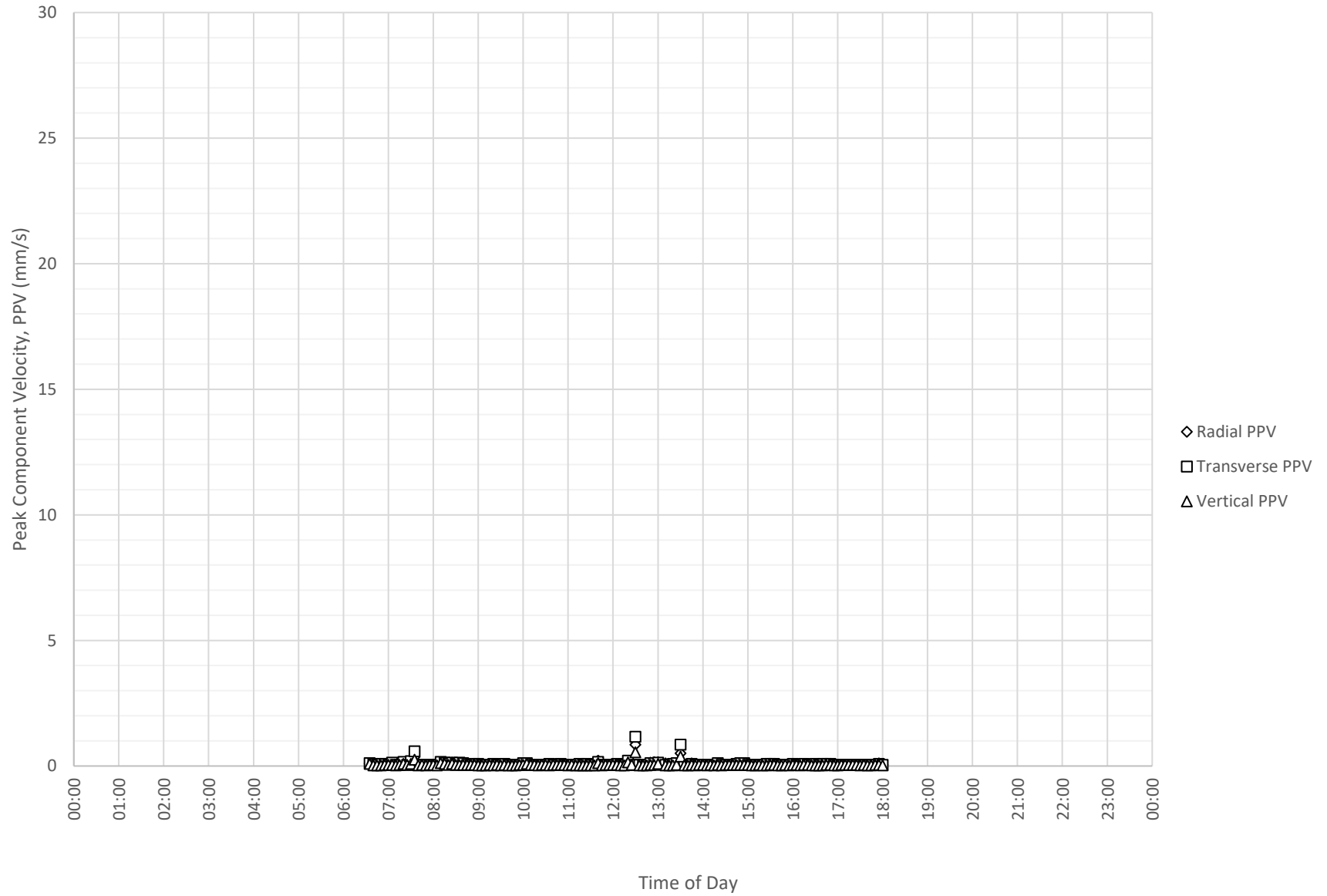
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 20-09-2022



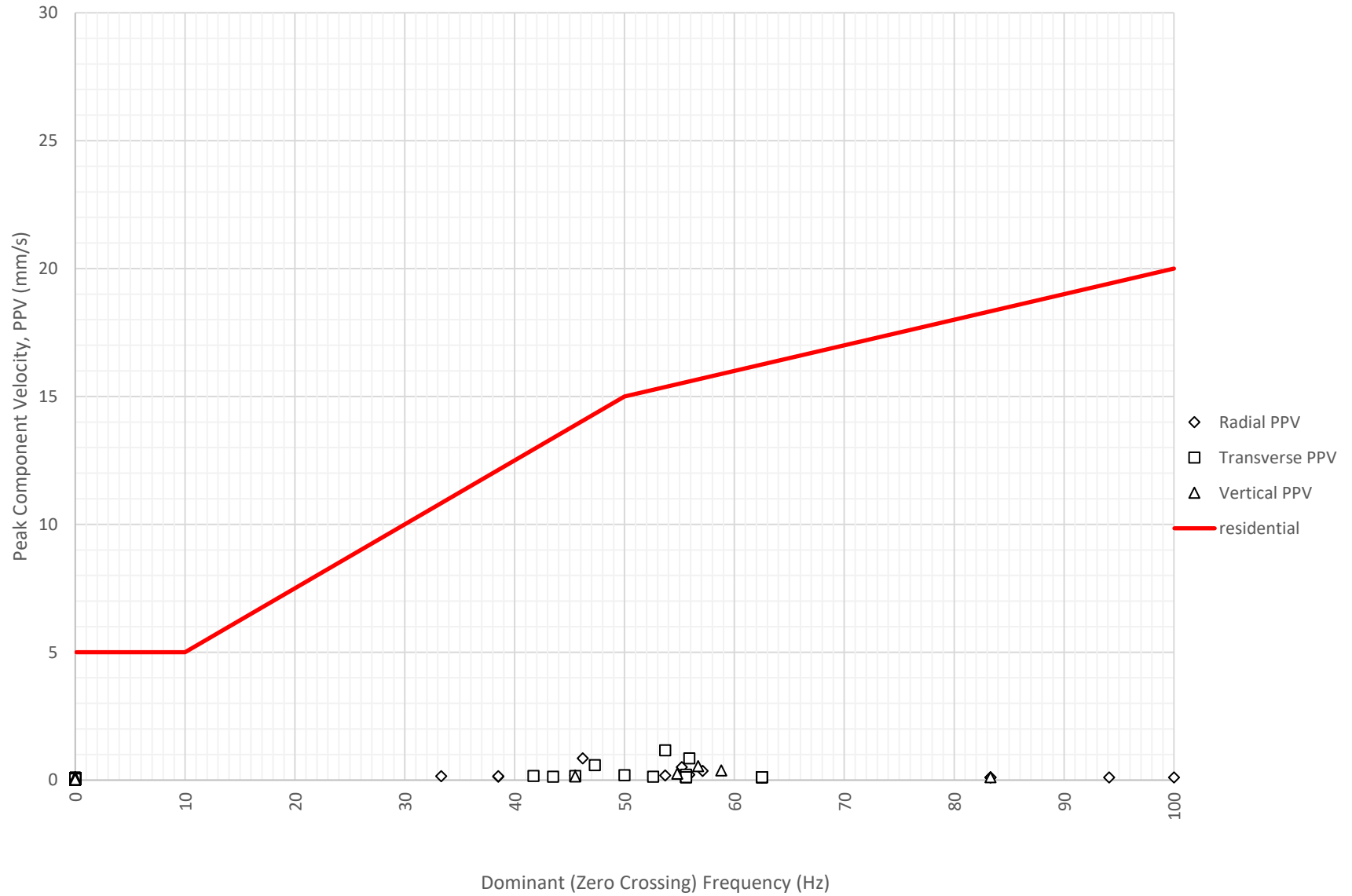
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 20-09-2022



Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 21-09-2022



Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 21-09-2022

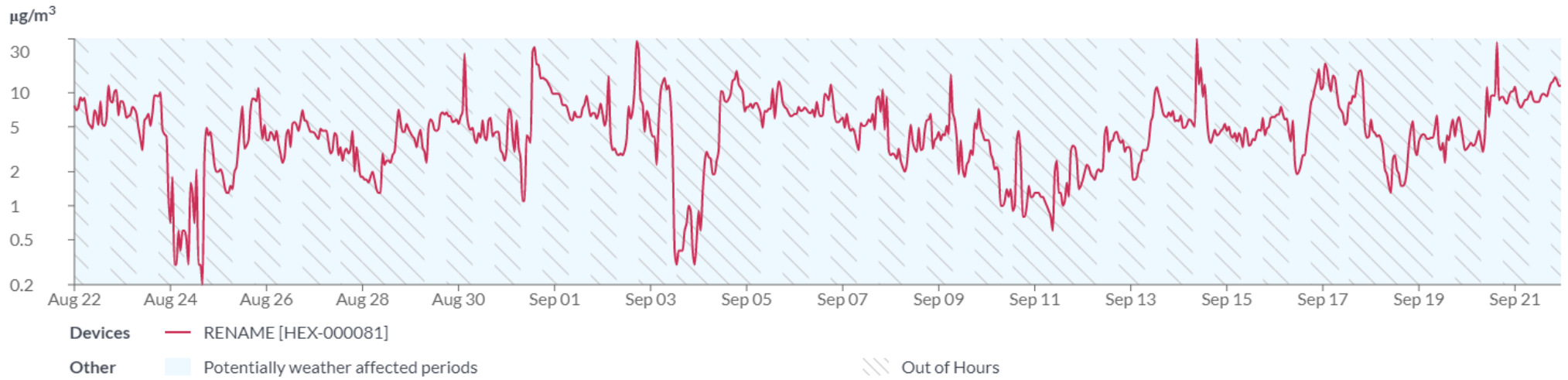


APPENDIX 3 – DUST MONITORING RESULTS

Hourly Average

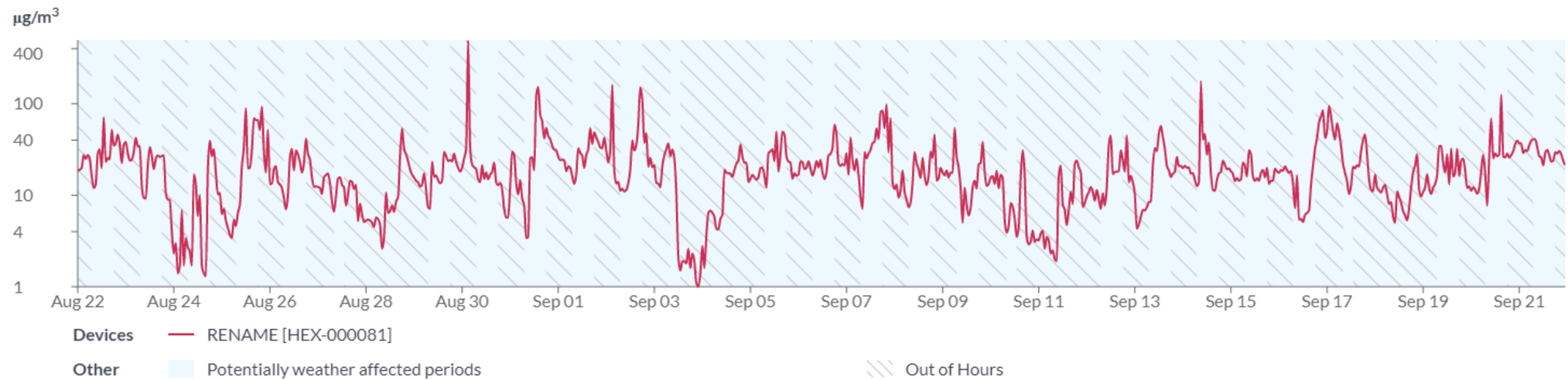
PM2.5

Aug 22 2022 - Sep 21 2022



PM10

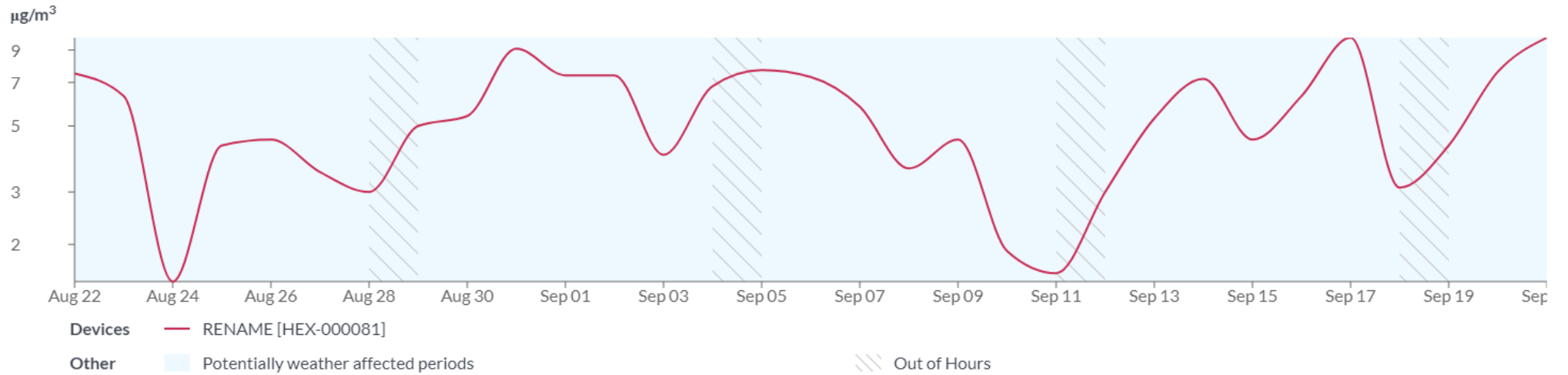
Aug 22 2022 - Sep 21 2022



Daily average

PM2.5

Aug 22 2022 - Sep 21 2022



PM10

Aug 22 2022 - Sep 21 2022

