



Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley

Monthly Report 1

22.07.2022 - 21.08.2022

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Attention To	Hazell Bros

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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:

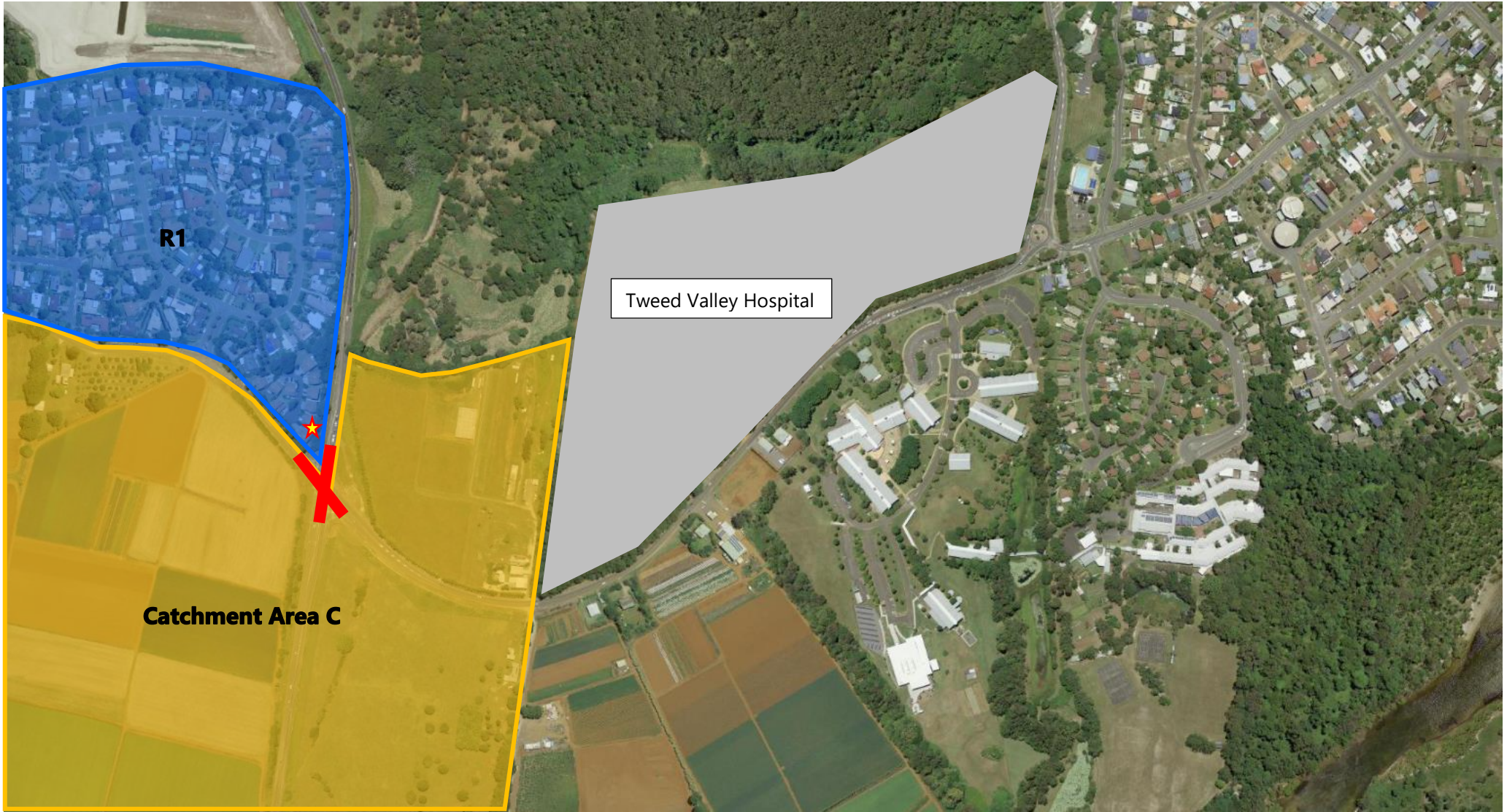
- Vibration Monitoring: 22nd of July to 21st of August 2022
- Noise Monitoring: 22nd of July to 21st of August 2022, and
- Dust Monitoring: 22nd of July to 21st of August 2022.

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 **Error! Reference source not found.**). 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 July 2022 and 21st August 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
Friday 2022-07-22	3.73mm/s@80.8Hz		Vibration levels satisfy DIN4150-3 Type 2 criteria
Saturday 2022-07-23	<3mm/s		
Sunday 2022-07-24	<3mm/s		
Monday 2022-07-25	<3mm/s		
Tuesday 2022-07-26	<3mm/s	5 mm/s (<10Hz)	
Wednesday 2022-07-27	<3mm/s		
Thursday 2022-07-28	<3mm/s	5-15 mm/s (10-50Hz)	
Friday 2022-07-29	<3mm/s	15-20mm/s (50-100Hz)	
Saturday 2022-07-30	<3mm/s		
Sunday 2022-07-31	<3mm/s		
Monday 2022-08-01	<3mm/s		
Tuesday 2022-08-02	<3mm/s		
Wednesday 2022-08-03	<3mm/s		

Date	Maximum Measured Vibration Level mm/s	Structural Damage Criteria for Type 2 (DIN4150-3)	Comments
Thursday 2022-08-04	<3mm/s		Vibration levels satisfy DIN4150-3 Type 2 criteria
Friday 2022-08-05	<3mm/s		
Saturday 2022-08-06	<3mm/s		
Sunday 2022-08-07	<3mm/s		
Monday 2022-08-08	<3mm/s		
Tuesday 2022-08-09	<3mm/s		
Wednesday 2022-08-10	<3mm/s		
Thursday 2022-08-11	<3mm/s	5 mm/s (<10Hz)	
Friday 2022-08-12	<3mm/s	5-15 mm/s (10-50Hz)	
Saturday 2022-08-13	<3mm/s		
Sunday 2022-08-14	<3mm/s	15-20mm/s (50-100Hz)	
Monday 2022-08-15	<3mm/s		
Tuesday 2022-08-16	<3mm/s		
Wednesday 2022-08-17	<3mm/s		
Thursday 2022-08-18	<3mm/s		
Friday 2022-08-19	<3mm/s		
Saturday 2022-08-20	<3mm/s		
Sunday 2022-08-21	<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 July to 21st August 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) _{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)}
Friday 2022-07-22	7am – 6pm	0.00%	95%	0.00%	0.00%
Saturday 2022-07-23	8am – 1pm	19.05%	80.95%	0.00%	0.00%
Sunday 2022-07-24	No Works				
Monday 2022-07-25	7am – 6pm	0.00%	100%	0.00%	0.00%
Tuesday 2022-07-26		6.82%	93.18%	0.00%	0.00%
Wednesday 2022-07-27		40.91%	59.09%	0.00%	0.00%
Thursday 2022-07-28		15.91%	84.09%	0.00%	0.00%
Friday 2022-07-29		2.27%	97.73%	0.00%	0.00%
Saturday 2022-07-30	8am – 1pm	38.1%	61.9%	0.00%	0.00%
Sunday 2022-07-31	No Works				
Monday 2022-08-01	7am – 6pm	15.91%	84.09%	0.00%	0.00%
Tuesday 2022-08-02		9.09%	90.91%	0.00%	0.00%
Wednesday 2022-08-03		11.36%	88.64%	0.00%	0.00%
Thursday 2022-08-04		4.55%	93.18%	2.27%	0.00%

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)}
Friday 2022-08-05	7am – 6pm	0.00%	100.00%	0.00%	0.00%
Saturday 2022-08-06	8am – 1pm	33.33%	66.67%	0.00%	0.00%
Sunday 2022-08-07	No Works				
Monday 2022-08-08	7am – 6pm	25.00%	68.18%	2.27%	0.00%
Tuesday 2022-08-09		34.09%	63.64%	0.00%	0.00%
Wednesday 2022-08-10		31.82%	68.18%	0.00%	0.00%
Thursday 2022-08-11		20.45%	79.55%	0.00%	0.00%
Friday 2022-08-12		4.55%	95.45%	0.00%	0.00%
Saturday 2022-08-13	8am – 1pm	28.57%	71.43%	0.00%	0.00%
Sunday 2022-08-14	No Works				
Monday 2022-08-15	7am – 6pm	15.91%	84.09%	0.00%	0.00%
Tuesday 2022-08-16		36.36%	63.64%	0.00%	0.00%
Wednesday 2022-08-17		13.64%	86.36%	0.00%	0.00%
Thursday 2022-08-18		9.09%	68.18%	2.27%	0.00%
Friday 2022-08-19		11.36%	88.64%	0.00%	0.00%
Saturday 2022-08-20	8am – 1pm	66.67%	33.33%	0.00%	0.00%
Sunday 2022-08-21	No Works				

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
Friday 2022-07-22	30 ¹	25	Weather affected	59 ¹	50	Weather affected
Saturday 2022-07-23	8		Yes	18		Yes
Sunday 2022-07-24	7		Yes	18		Yes
Monday 2022-07-25	8		Yes	29		Yes
Tuesday 2022-07-26	5		Yes	17		Yes
Wednesday 2022-07-27	2		Yes	8		Yes
Thursday 2022-07-28	5		Yes	16		Yes
Friday 2022-07-29	5		Yes	18		Yes
Saturday 2022-07-30	6		Yes	17		Yes
Sunday 2022-07-31	4		Yes	14		Yes
Monday 2022-08-01	5 ¹		Weather affected	20 ¹		Weather affected
Tuesday 2022-08-02	4		Yes	14		Yes
Wednesday 2022-08-03	5		Yes	16		Yes
Thursday 2022-08-04	4		Yes	12		Yes
Friday 2022-08-05	5		Yes	14		Yes
Saturday 2022-08-06	2		Yes	8		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
Sunday 2022-08-07	1	25	Yes	5	50	Yes
Monday 2022-08-08	3		Yes	10		Yes
Tuesday 2022-08-09	5		Yes	18		Yes
Wednesday 2022-08-10	7		Yes	23		Yes
Thursday 2022-08-11	6		Yes	21		Yes
Friday 2022-08-12	5		Yes	16		Yes
Saturday 2022-08-13	6 ¹		Weather affected	70 ¹		Weather affected
Sunday 2022-08-14	9		Yes	251 ¹		Weather affected
Monday 2022-08-15	2		Yes	12		Yes
Tuesday 2022-08-16	2		Yes	11		Yes
Wednesday 2022-08-17	3		Yes	11		Yes
Thursday 2022-08-18	4		Yes	22		Yes
Friday 2022-08-19	5		Yes	19		Yes
Saturday 2022-08-20	4		Yes	23		Yes
Sunday 2022-08-21	7		Yes	23		Yes

Note 1: Extreme rainfall events caused dust exceedances (not Construction works)

Adverse weather events caused technical failures and limited maintenance works, impacting measurements between the 22nd July and 24th July and the 11th August and 14th August.

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
Friday 2022-07-22	39	62-97	Yes	89	80-120	Yes
Saturday 2022-07-23	12		Yes	29		Yes
Sunday 2022-07-24	13		Yes	43		Yes
Monday 2022-07-25	16		Yes	71		Yes
Tuesday 2022-07-26	11		Yes	38		Yes
Wednesday 2022-07-27	5		Yes	27		Yes
Thursday 2022-07-28	8		Yes	49		Yes
Friday 2022-07-29	7		Yes	33		Yes
Saturday 2022-07-30	11		Yes	35		Yes
Sunday 2022-07-31	6		Yes	23		Yes
Monday 2022-08-01	12		Yes	87		Yes
Tuesday 2022-08-02	5		Yes	23		Yes
Wednesday 2022-08-03	8		Yes	29		Yes
Thursday 2022-08-04	9		Yes	39		Yes
Friday 2022-08-05	10		Yes	31		Yes
Saturday 2022-08-06	7		Yes	41		Yes
Sunday 2022-08-07	4		Yes	17		Yes

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 2022-08-08	9	62-97	Yes	21	80-120	Yes
Tuesday 2022-08-09	9		Yes	56		Yes
Wednesday 2022-08-10	13		Yes	50		Yes
Thursday 2022-08-11	11		Yes	35		Yes
Friday 2022-08-12	8		Yes	22		Yes
Saturday 2022-08-13	8		Yes	1362		Weather affected
Sunday 2022-08-14	68		Weather affected	2062		Weather affected
Monday 2022-08-15	4		Yes	29		Yes
Tuesday 2022-08-16	6		Yes	74		Yes
Wednesday 2022-08-17	6		Yes	26		Yes
Thursday 2022-08-18	10		Yes	54		Yes
Friday 2022-08-19	13		Yes	49		Yes
Saturday 2022-08-20	9		Yes	141		Non construction works related
Sunday 2022-08-21	15		Yes	59		Yes

Exceedances on 13th, 14th and 20th August were recorded outside construction hours and caused by extreme weather conditions.

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.

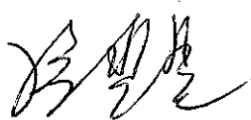
This monitoring report presents the noise and vibration monitoring for the periods as follows:

- Vibration Monitoring: 22nd of July to 21st of August 2022
- Noise Monitoring: 22nd of July to 21st of August 2022, and
- Dust Monitoring: 22nd of July to 21st of August 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. Dust measurements exceeded the criteria limits on the 13th, 14th and 20th of August, however were determined to be the result of extreme weather conditions instead of 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.

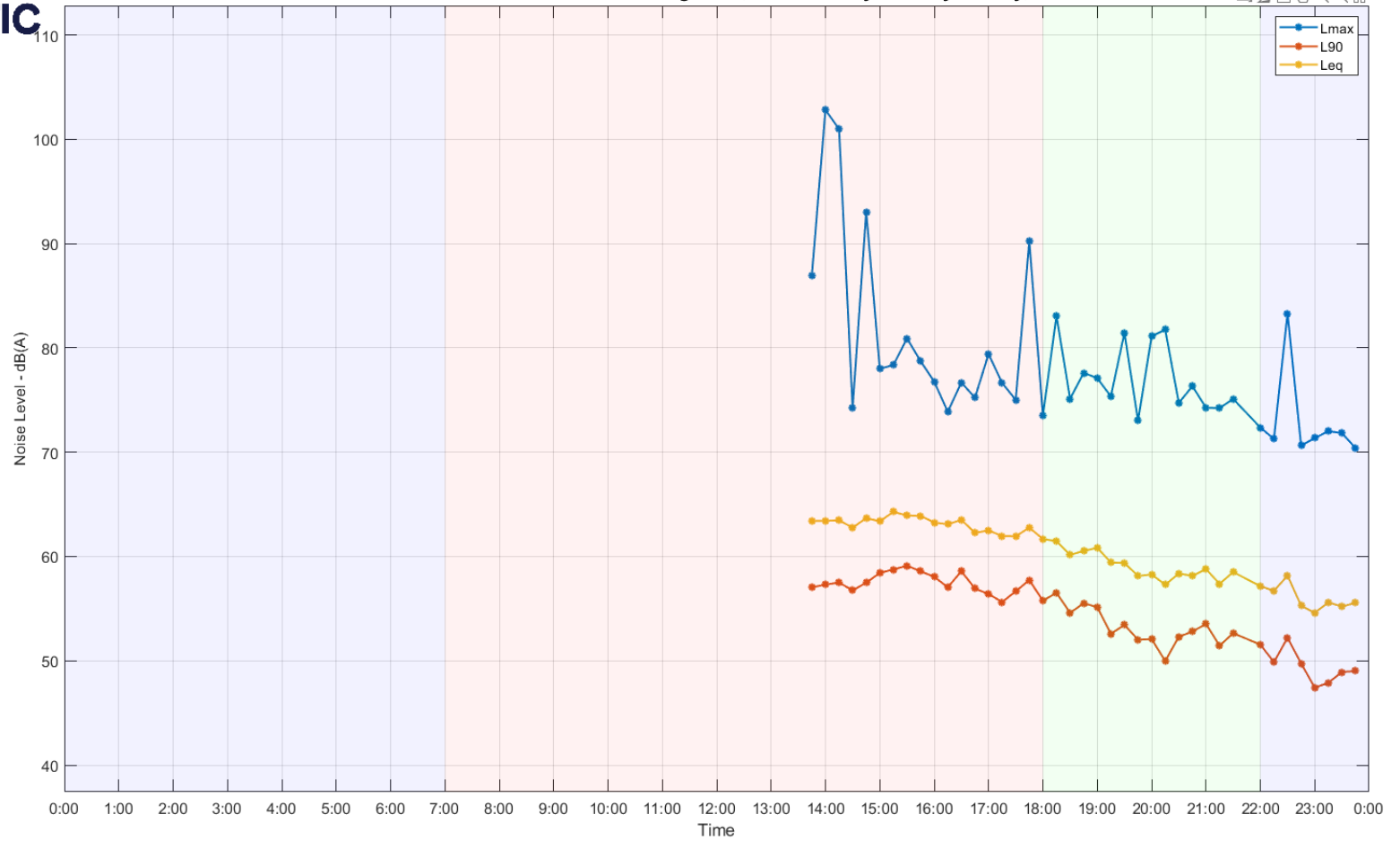
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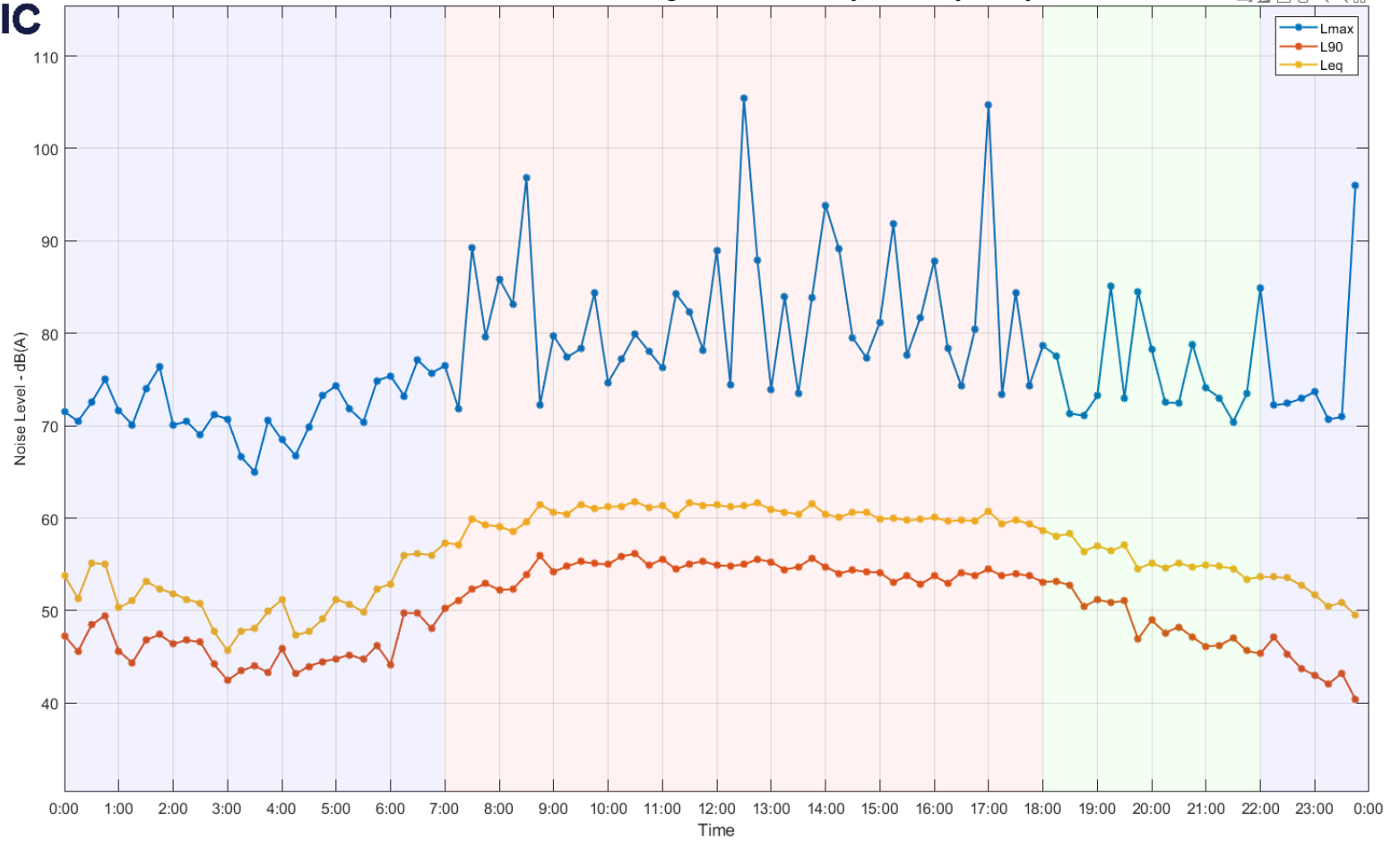
APPENDIX 1 – NOISE MONITORING RESULTS



Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Friday 22 July, 2022

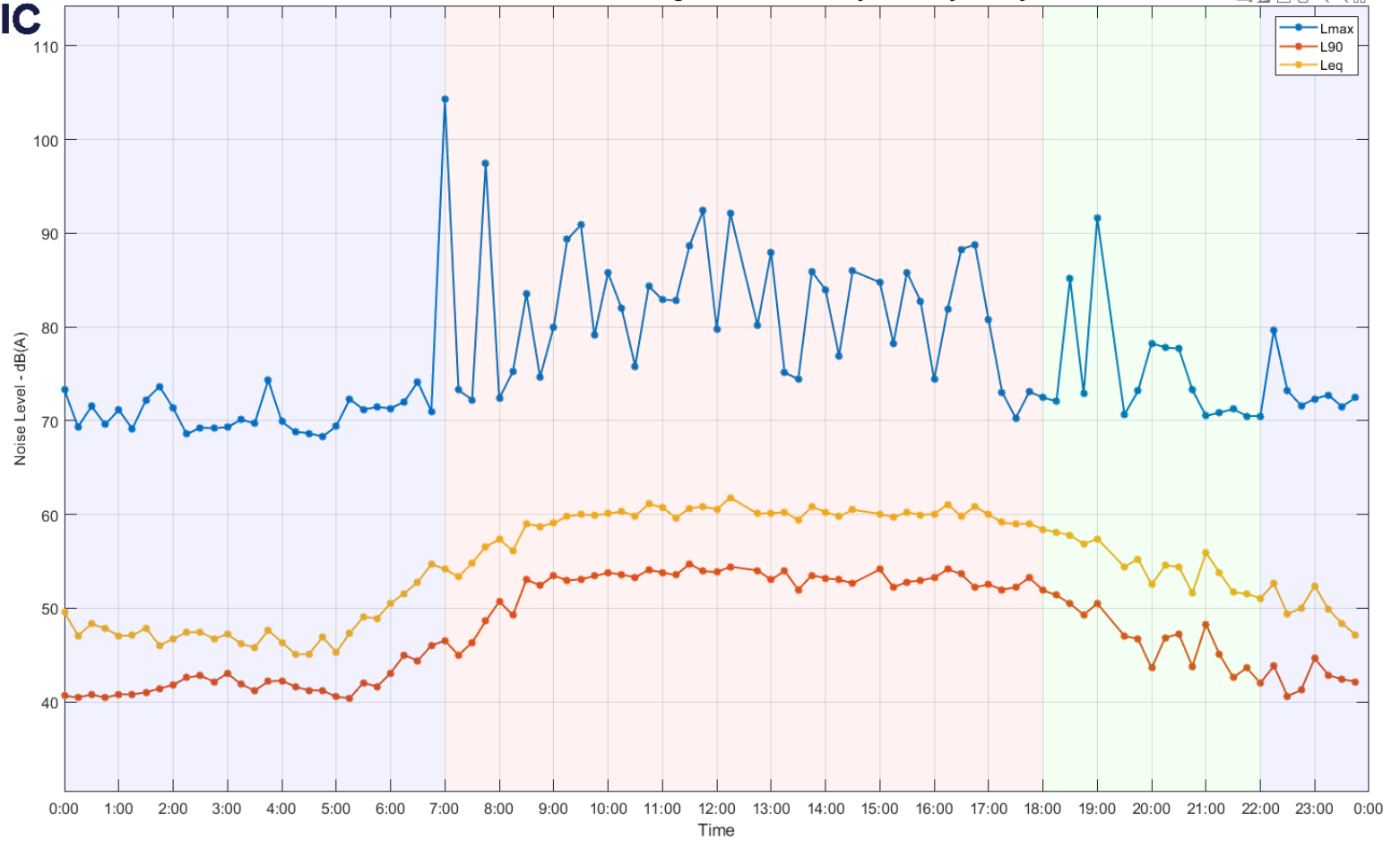


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Saturday 23 July, 2022

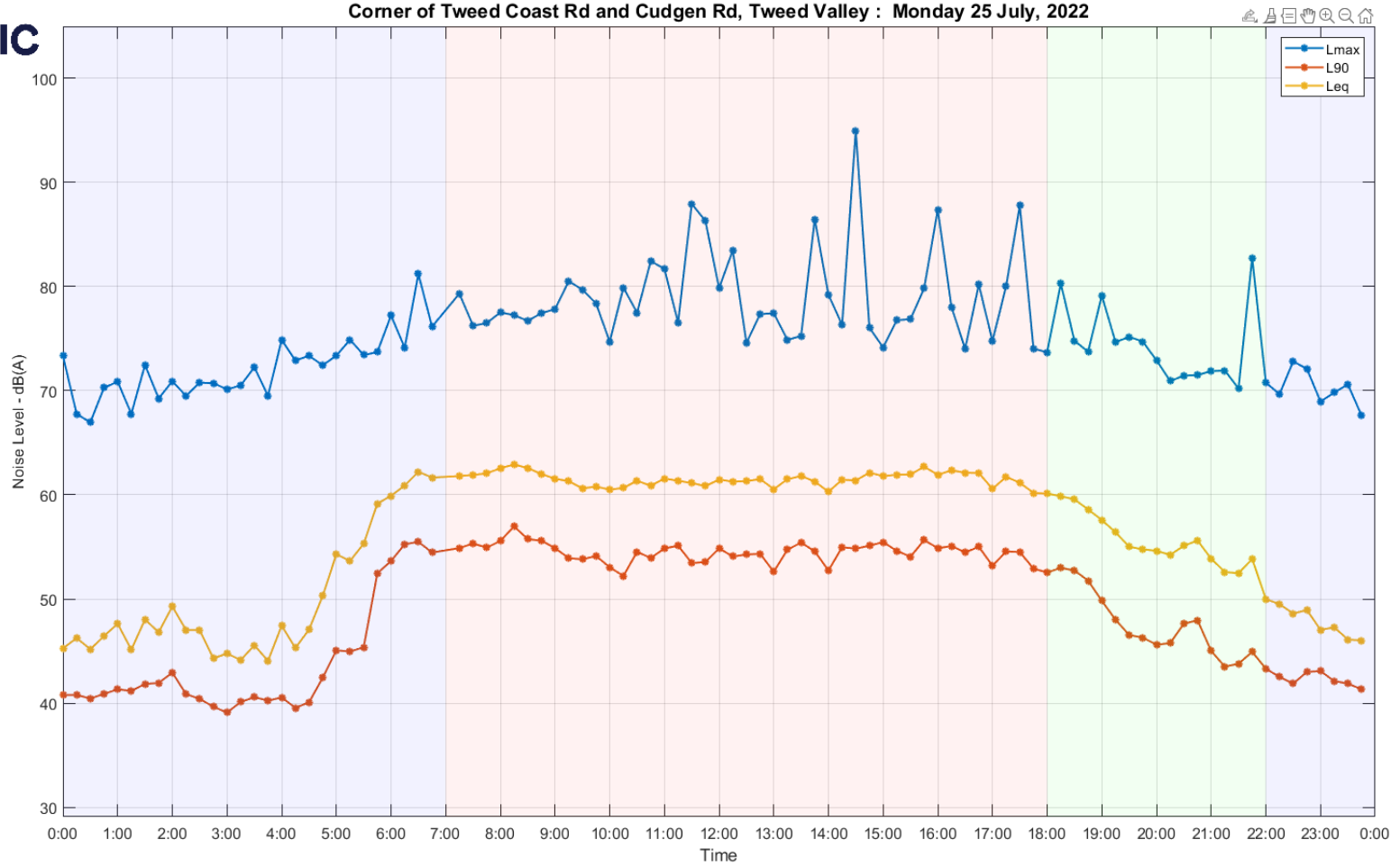




Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Sunday 24 July, 2022

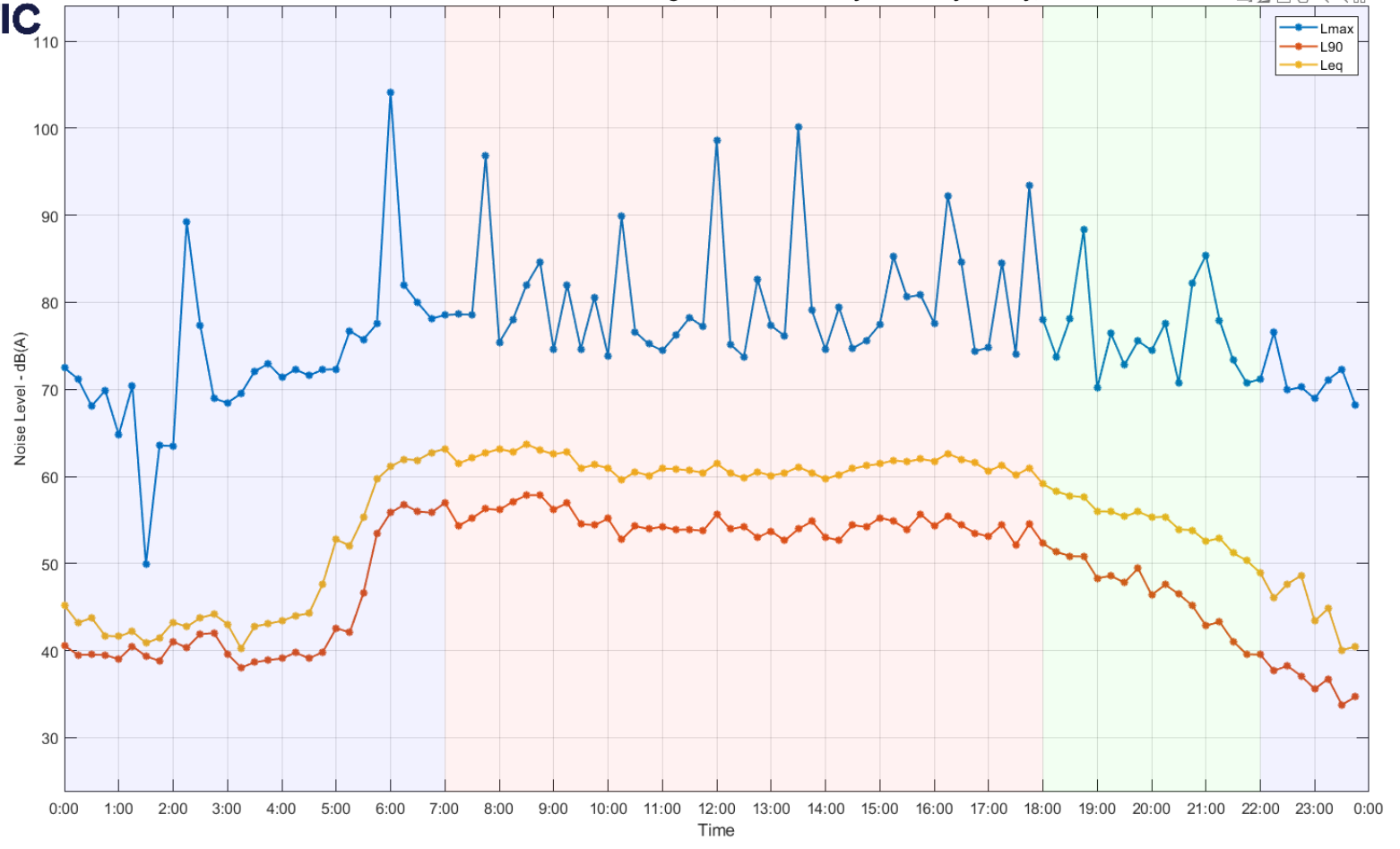


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Monday 25 July, 2022

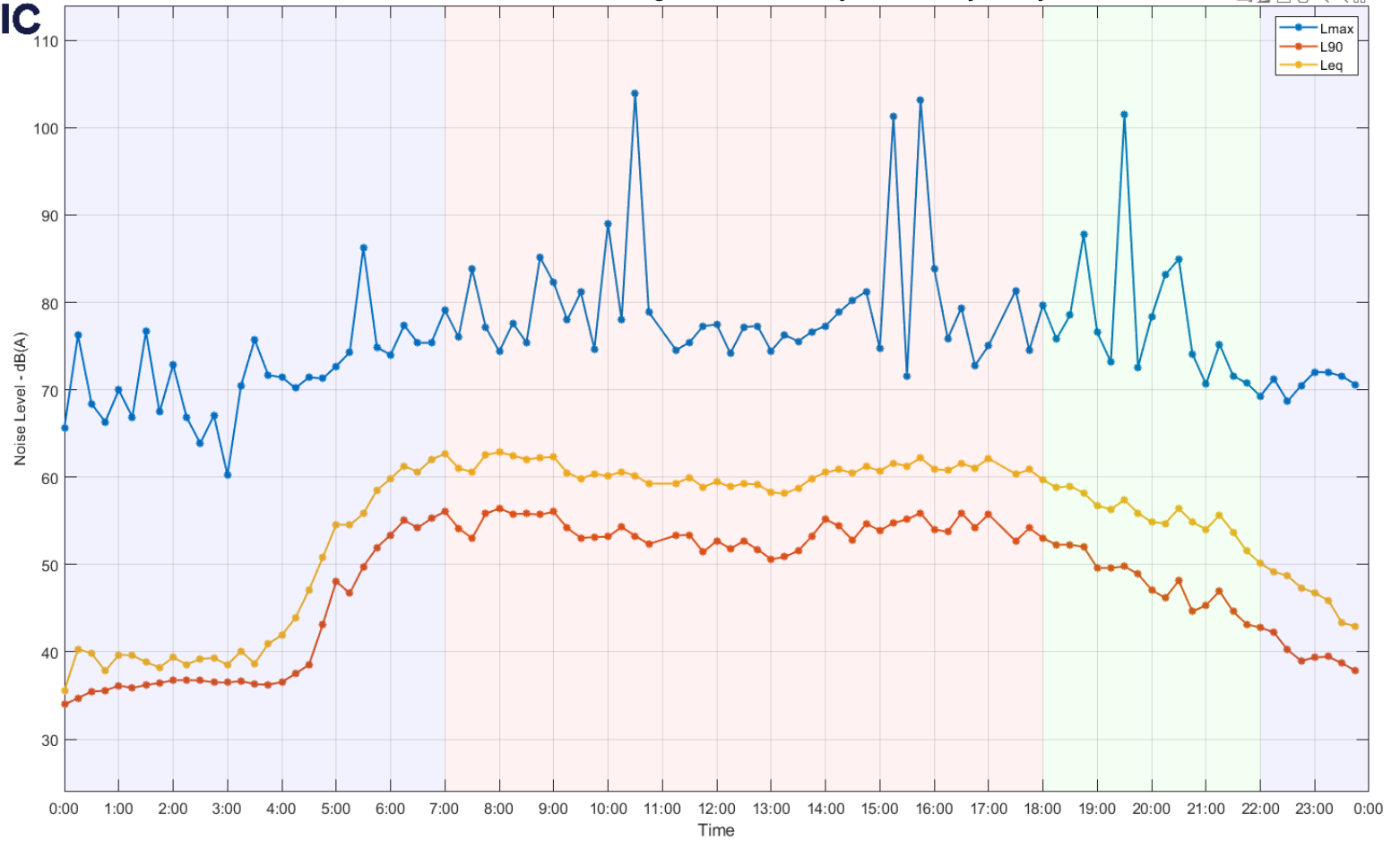




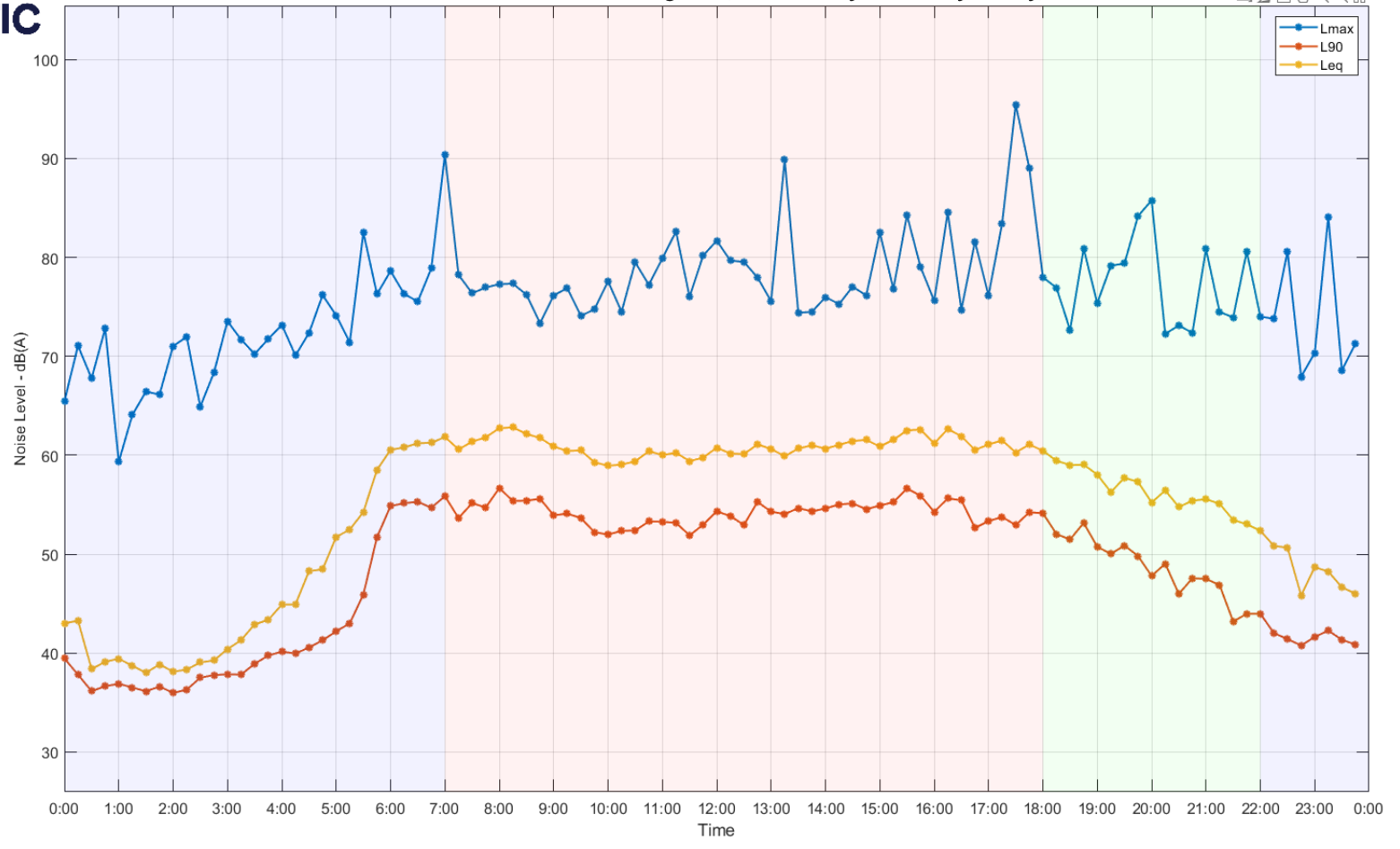
Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Tuesday 26 July, 2022



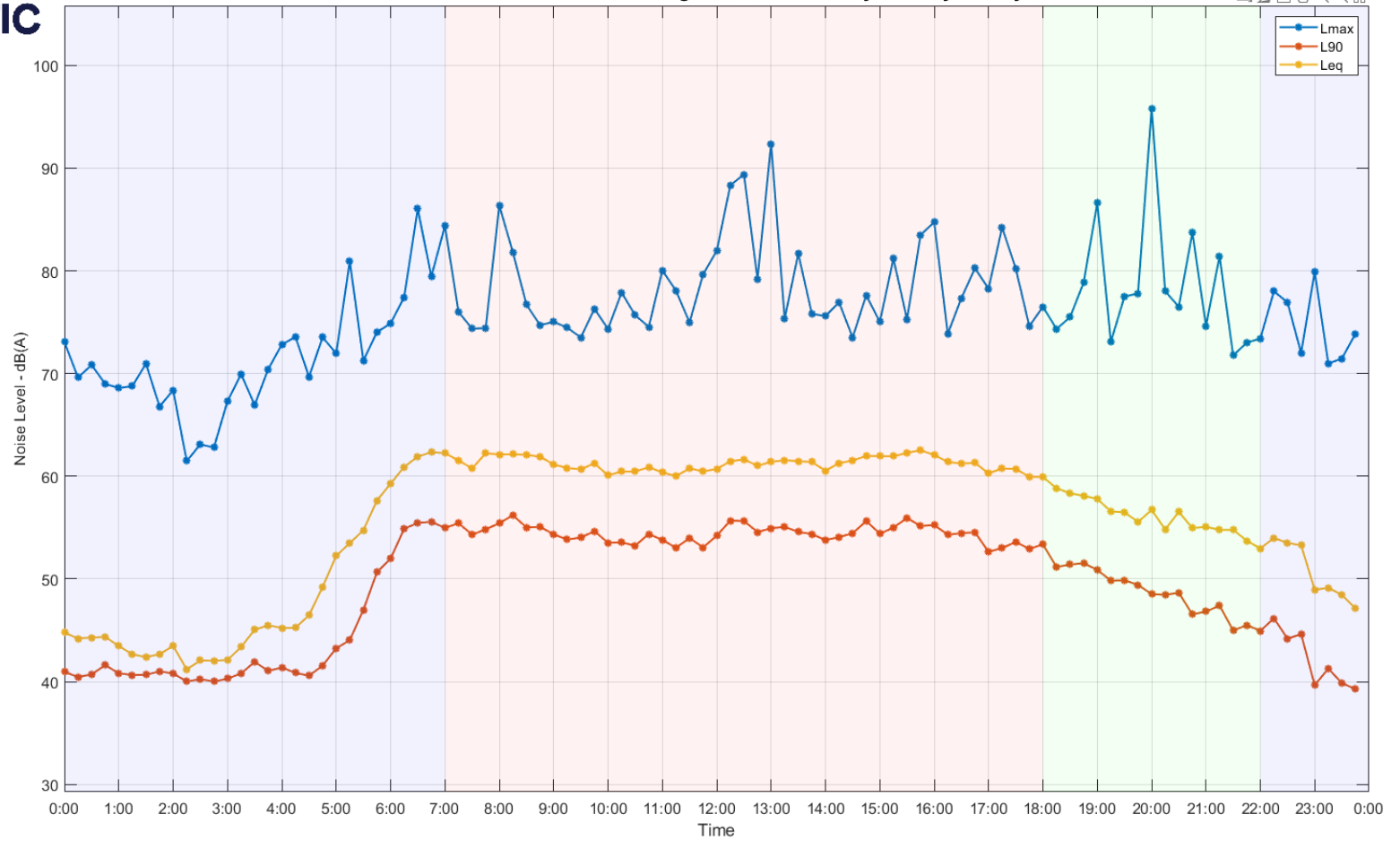
Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Wednesday 27 July, 2022



Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Thursday 28 July, 2022

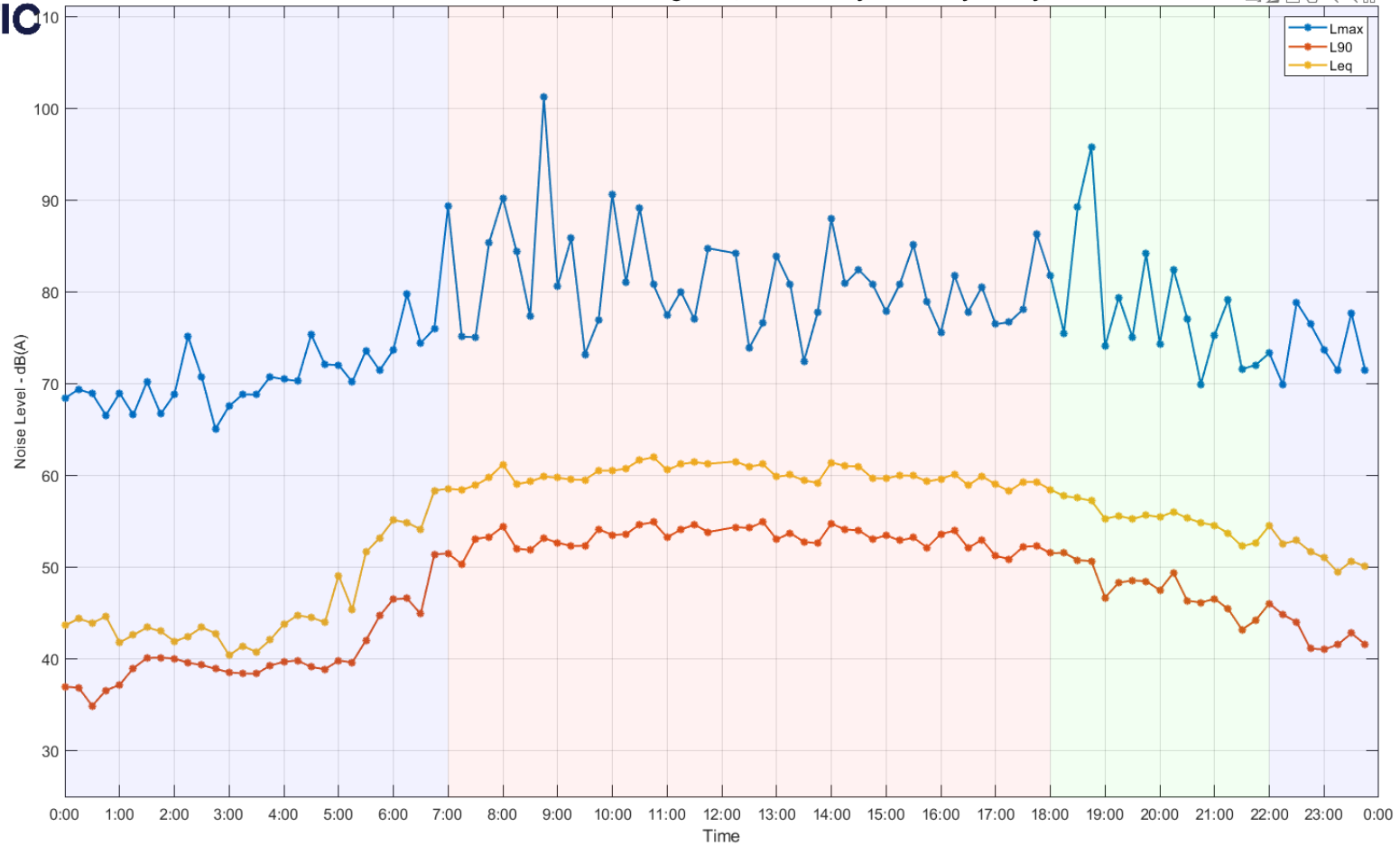


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Friday 29 July, 2022



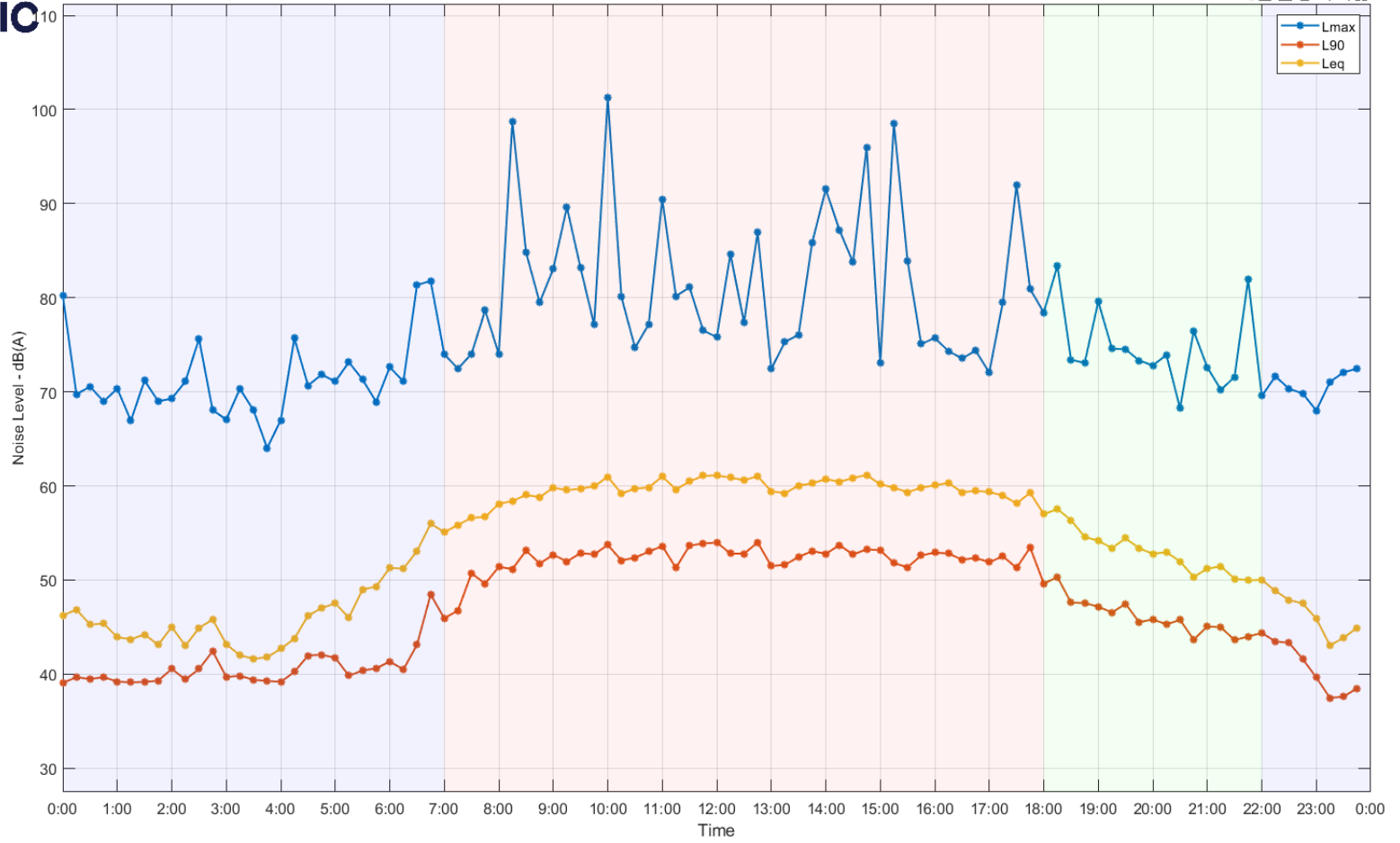


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Saturday 30 July, 2022



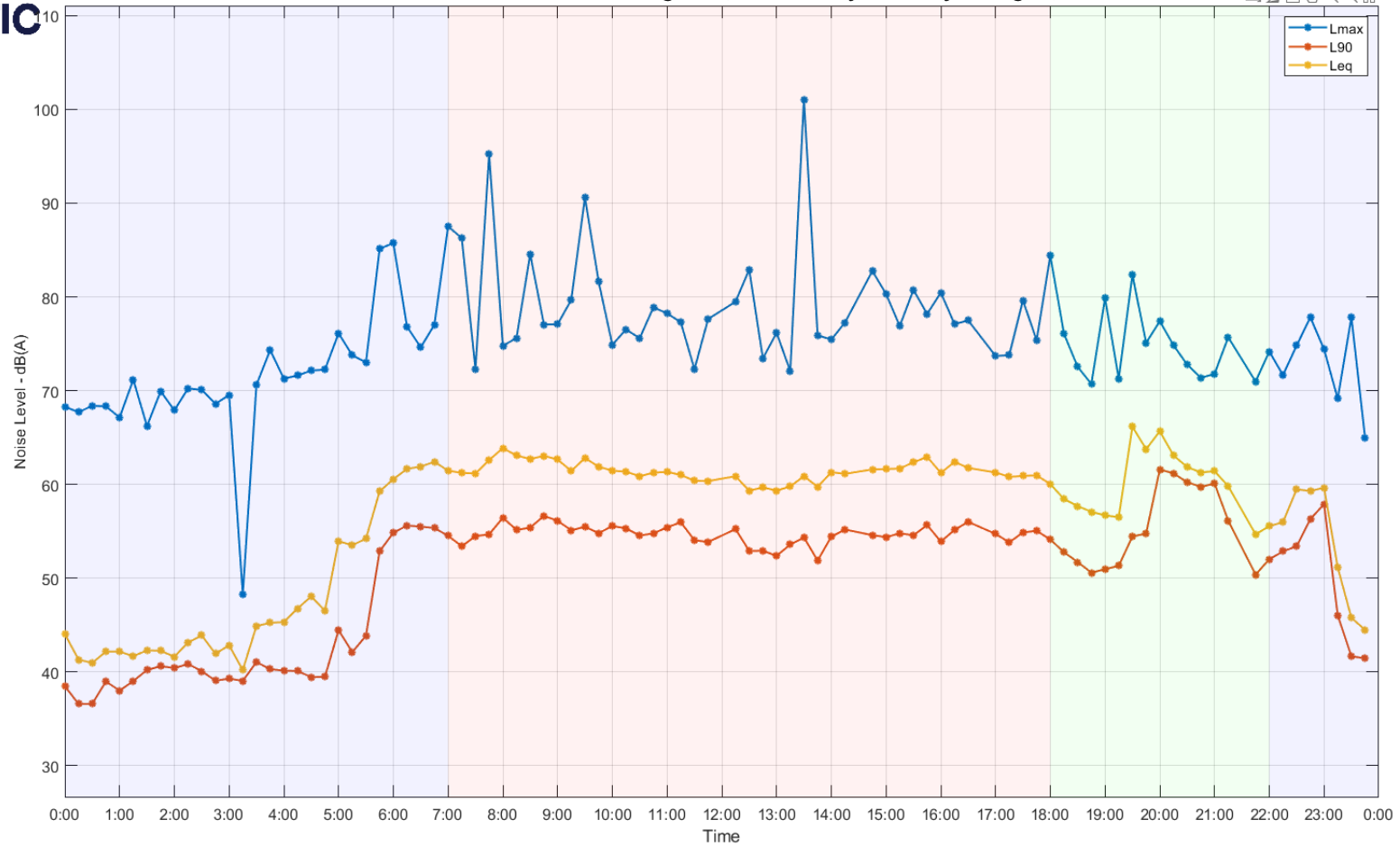


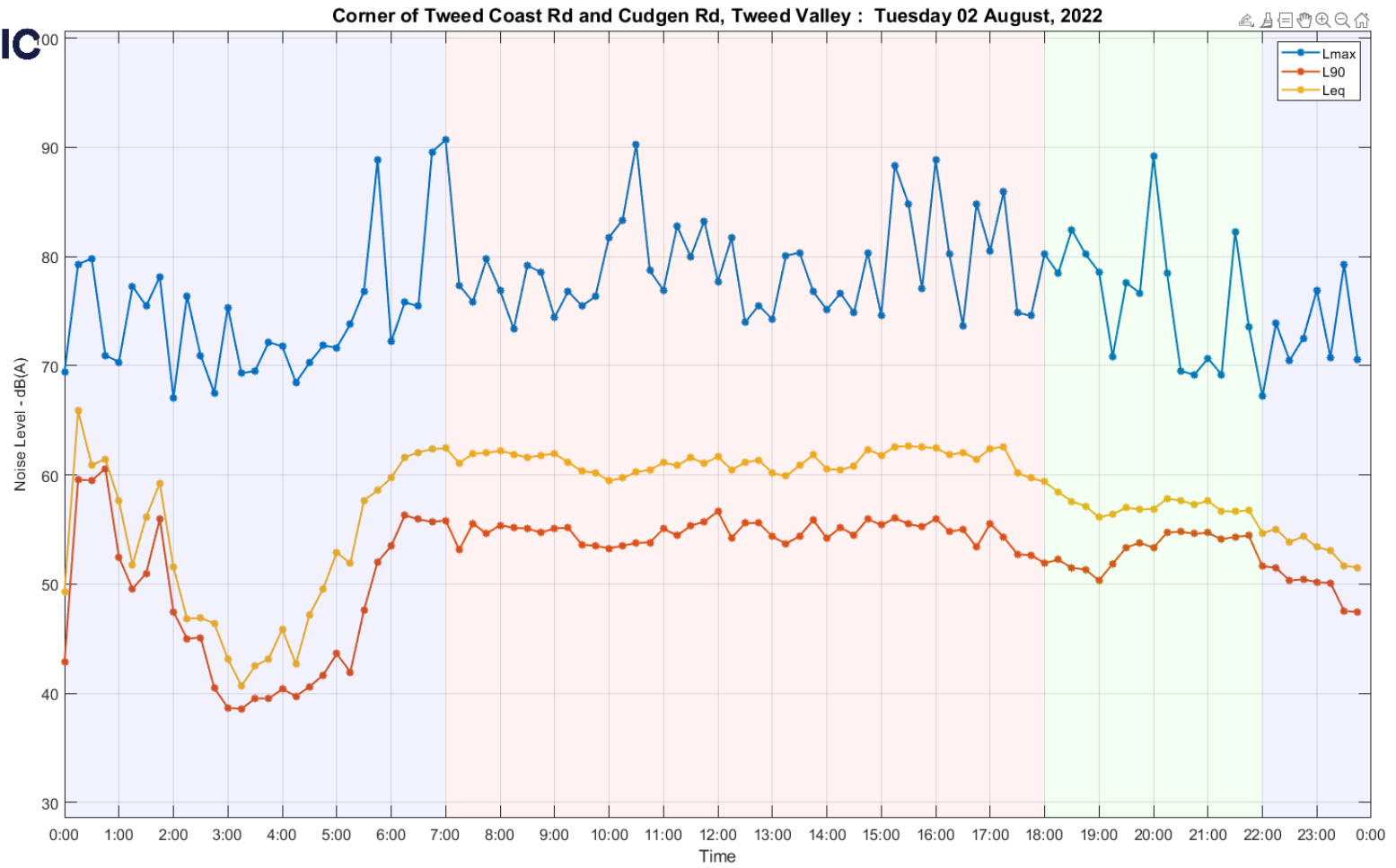
Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Sunday 31 July, 2022





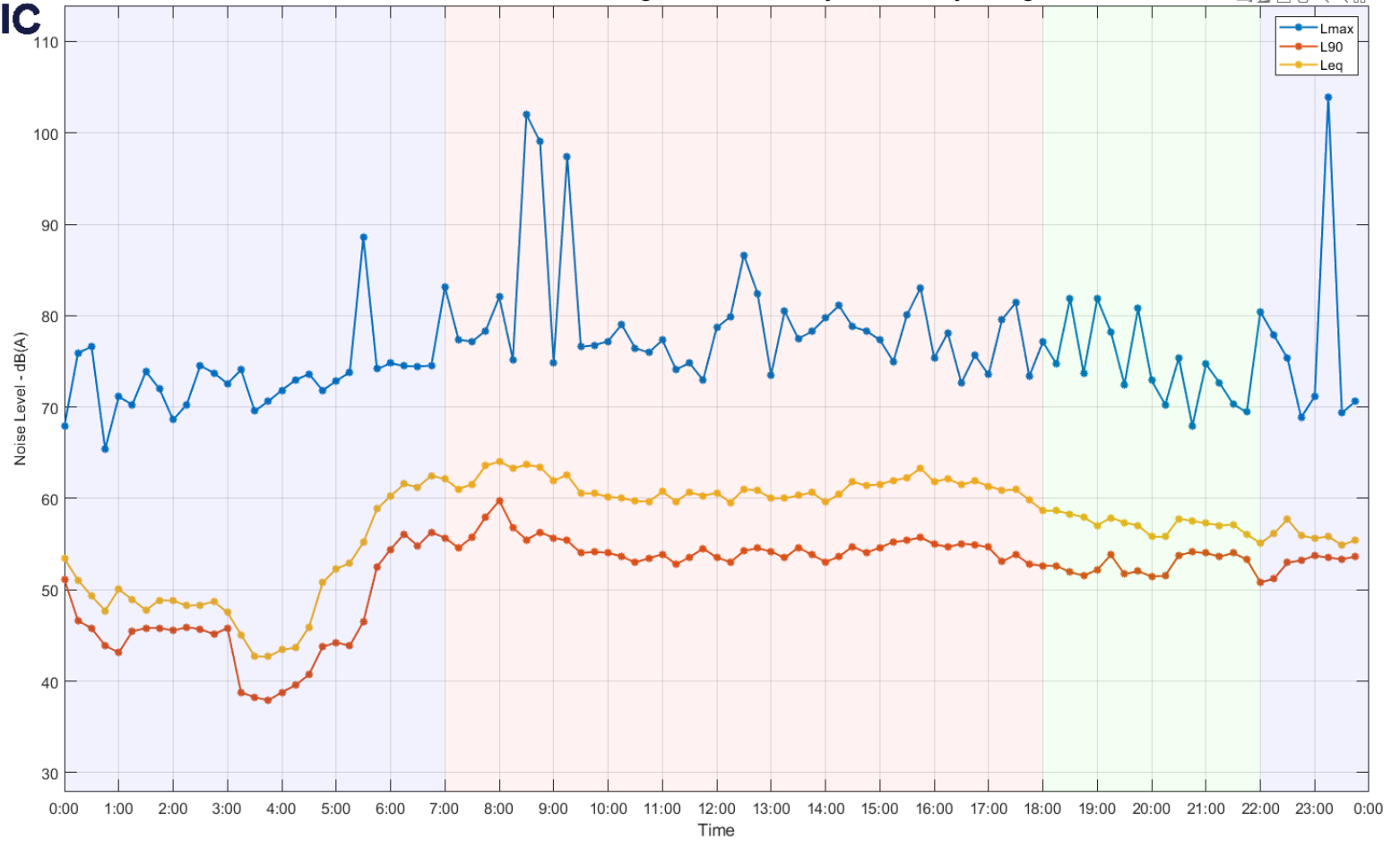
Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Monday 01 August, 2022

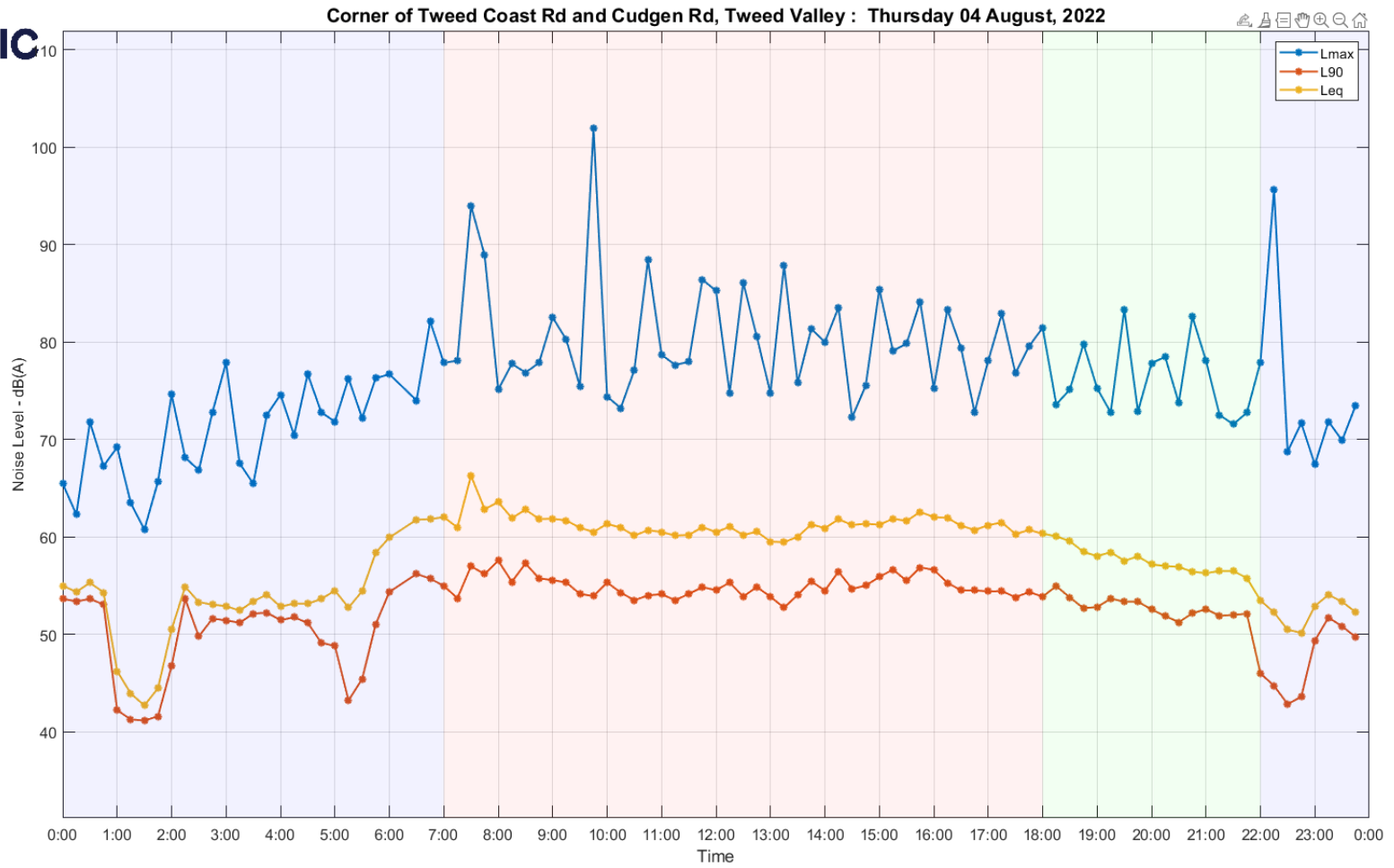




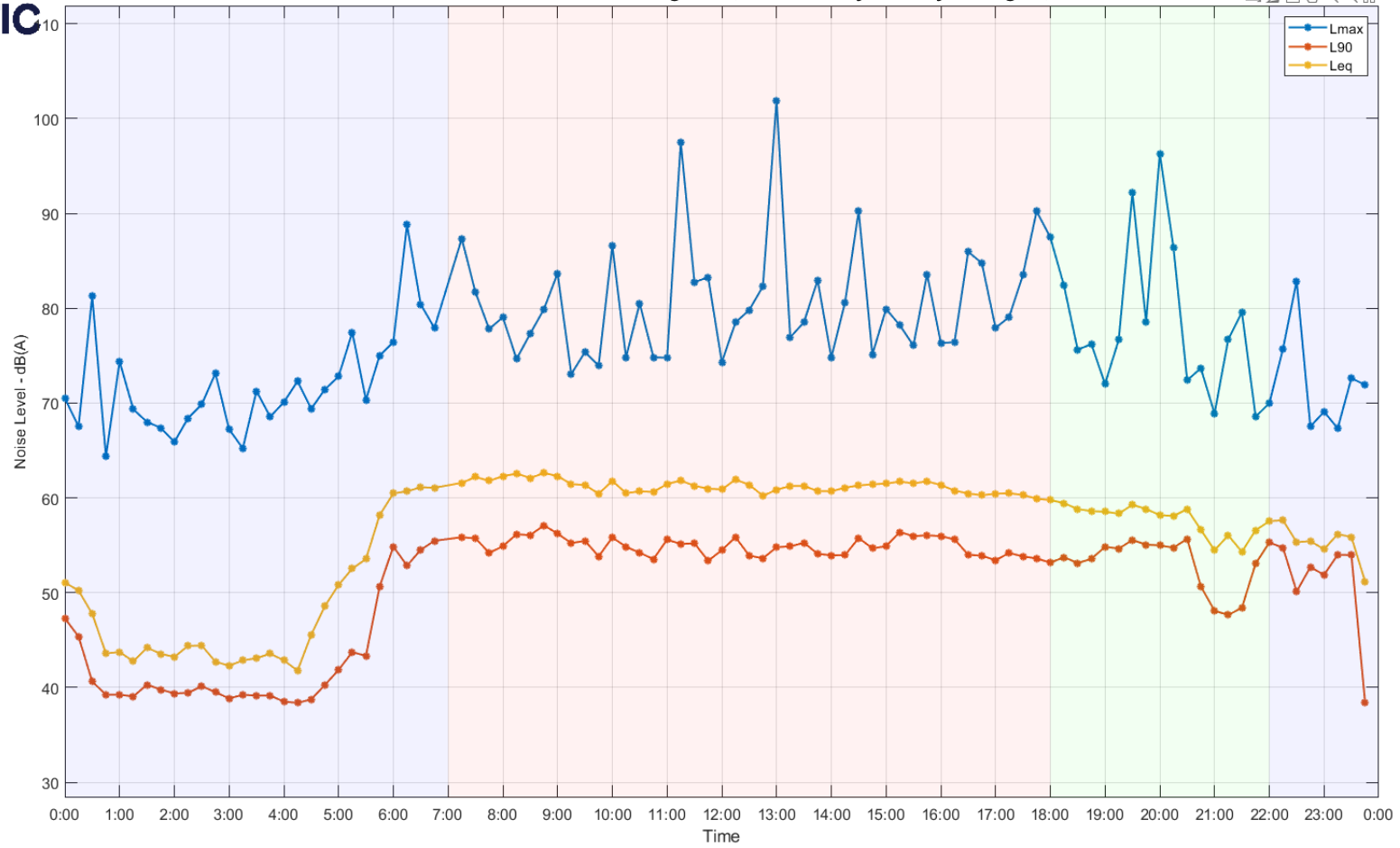


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Wednesday 03 August, 2022

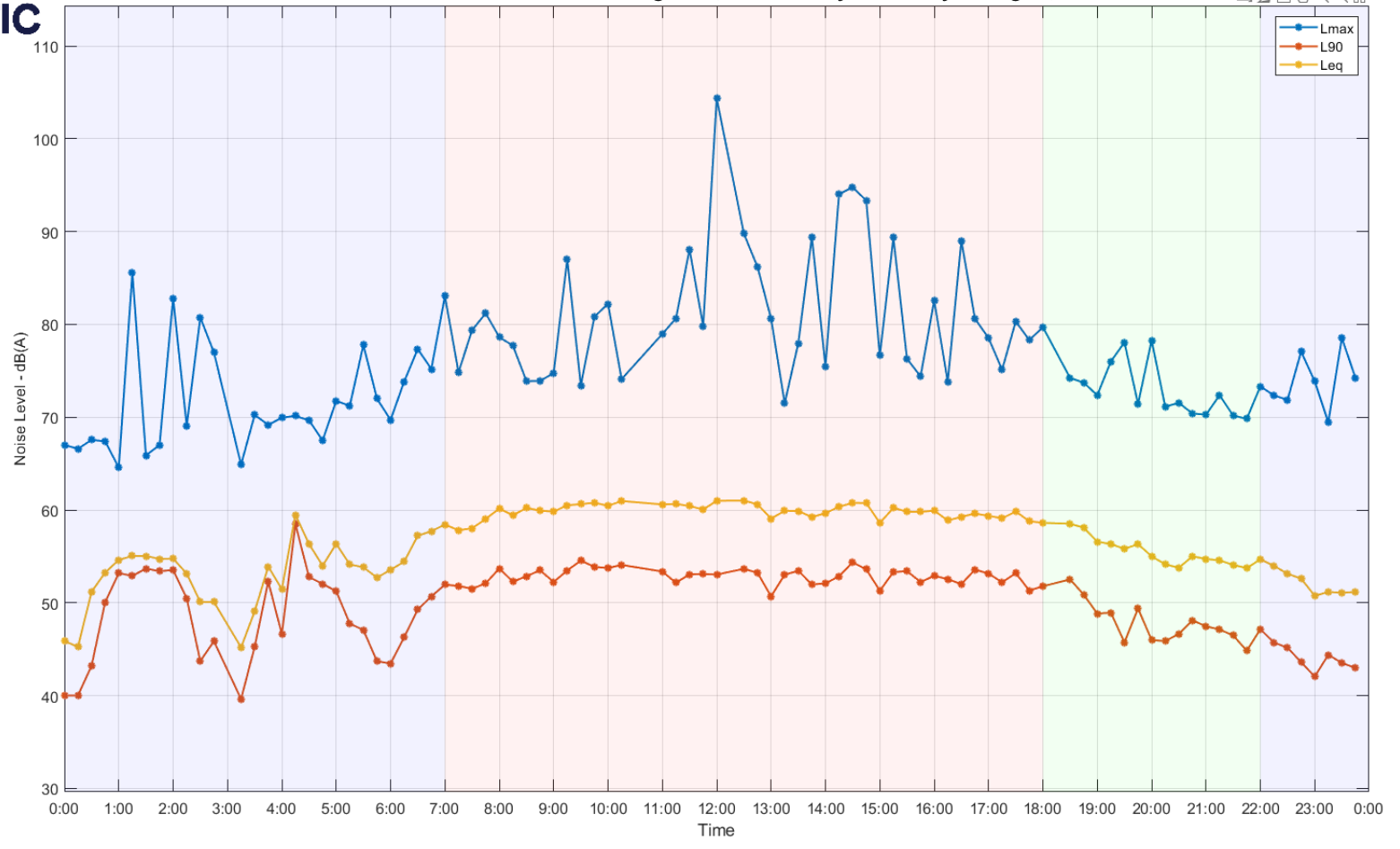




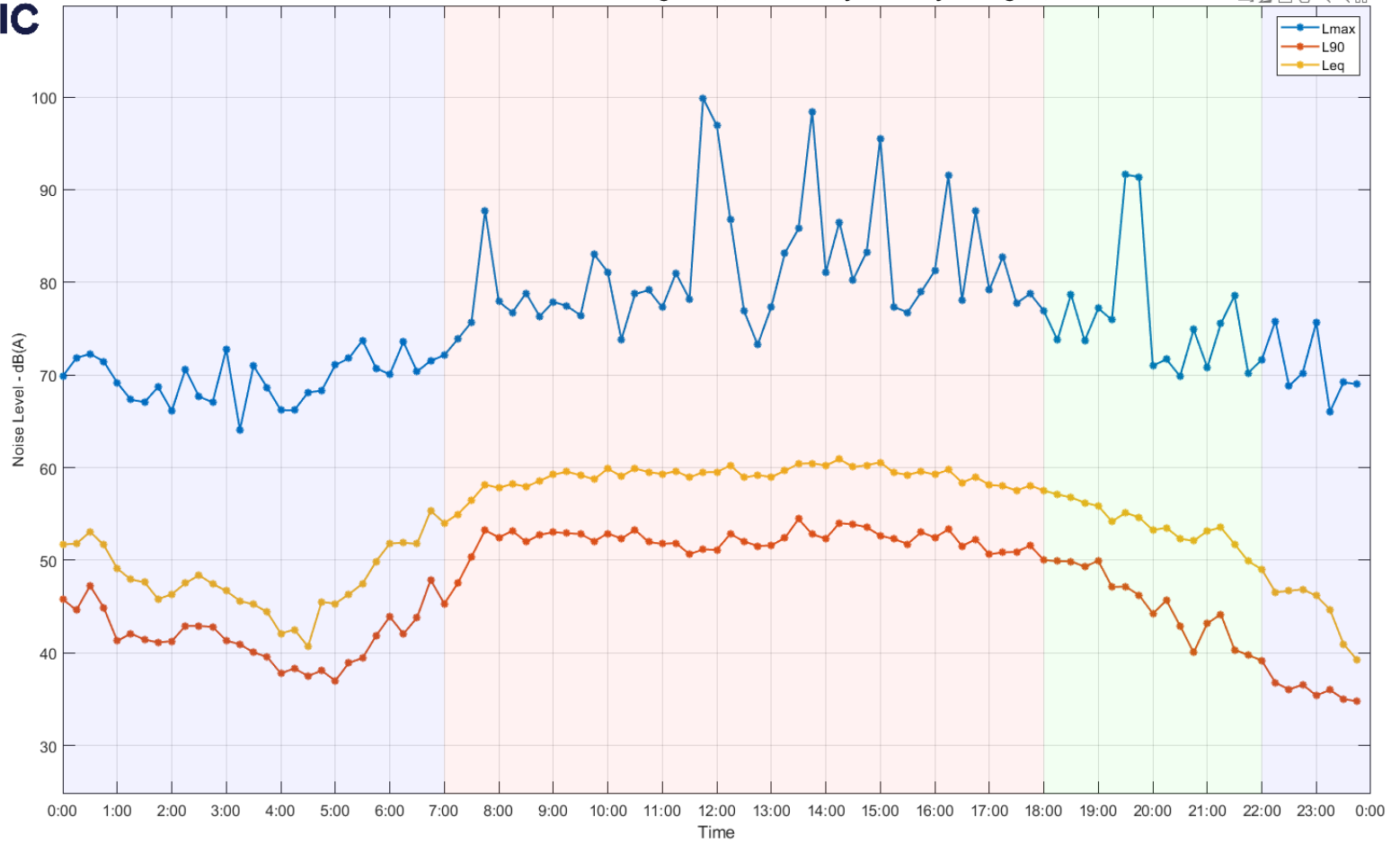
Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Friday 05 August, 2022



Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Saturday 06 August, 2022

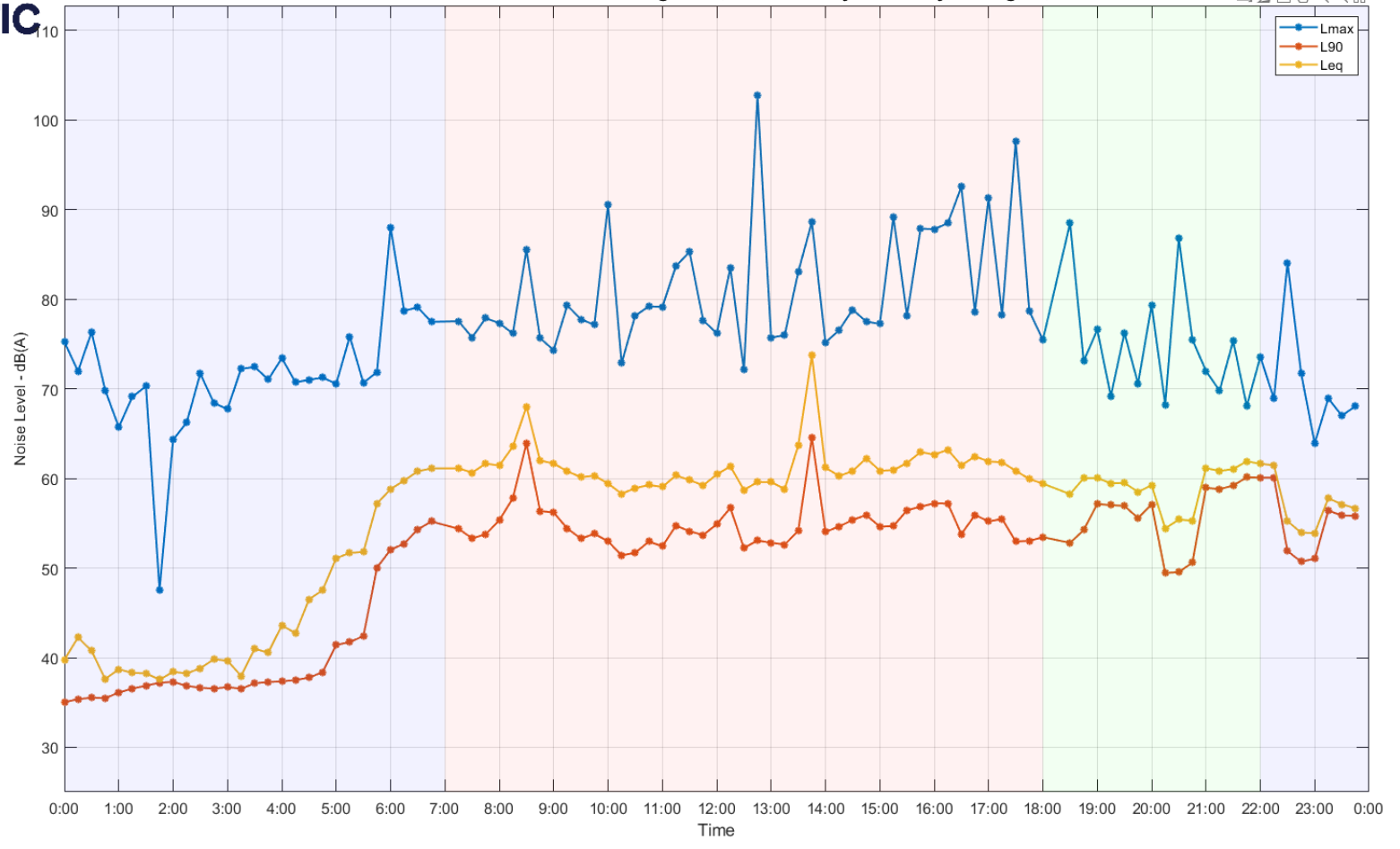


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Sunday 07 August, 2022

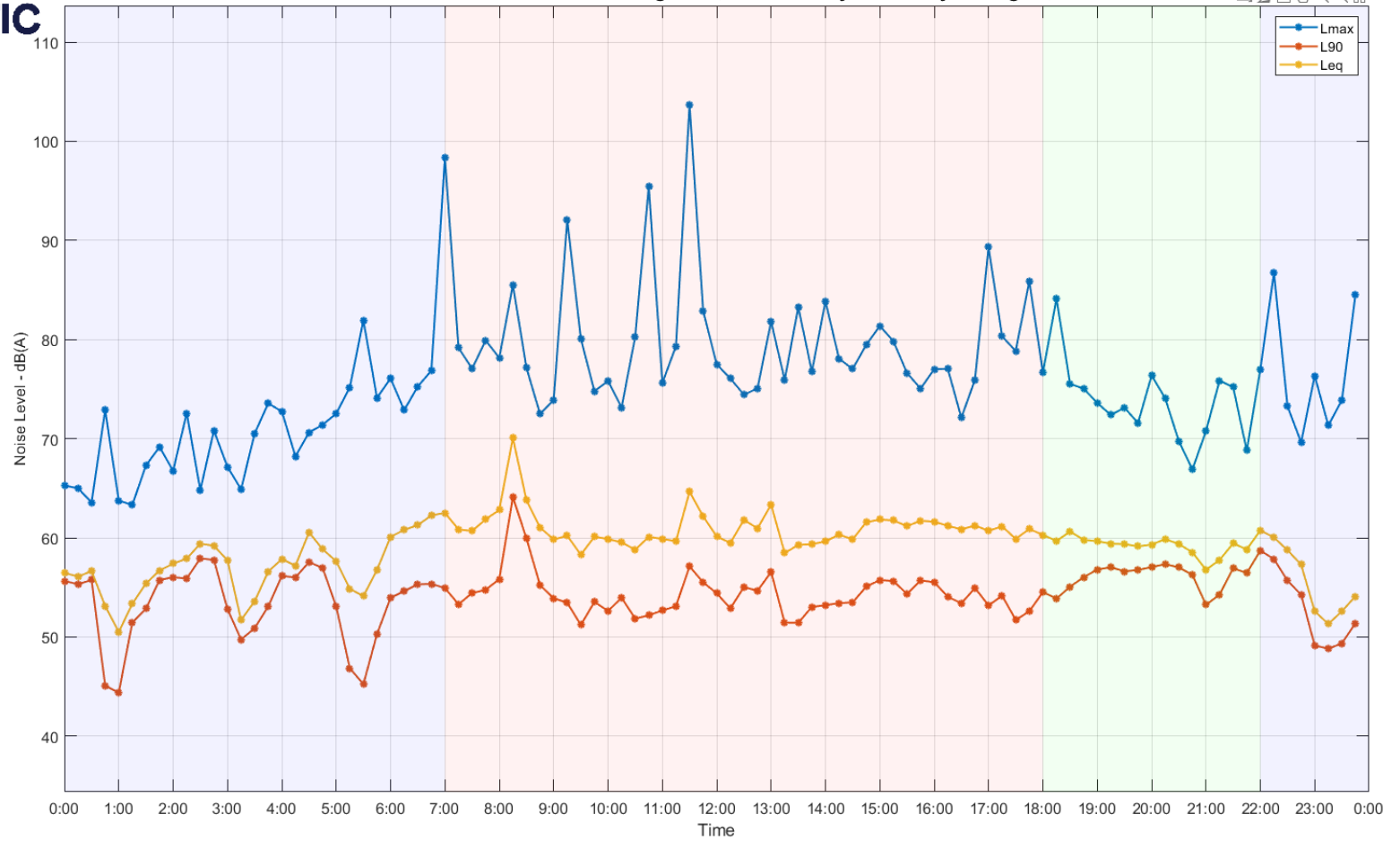




Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Monday 08 August, 2022

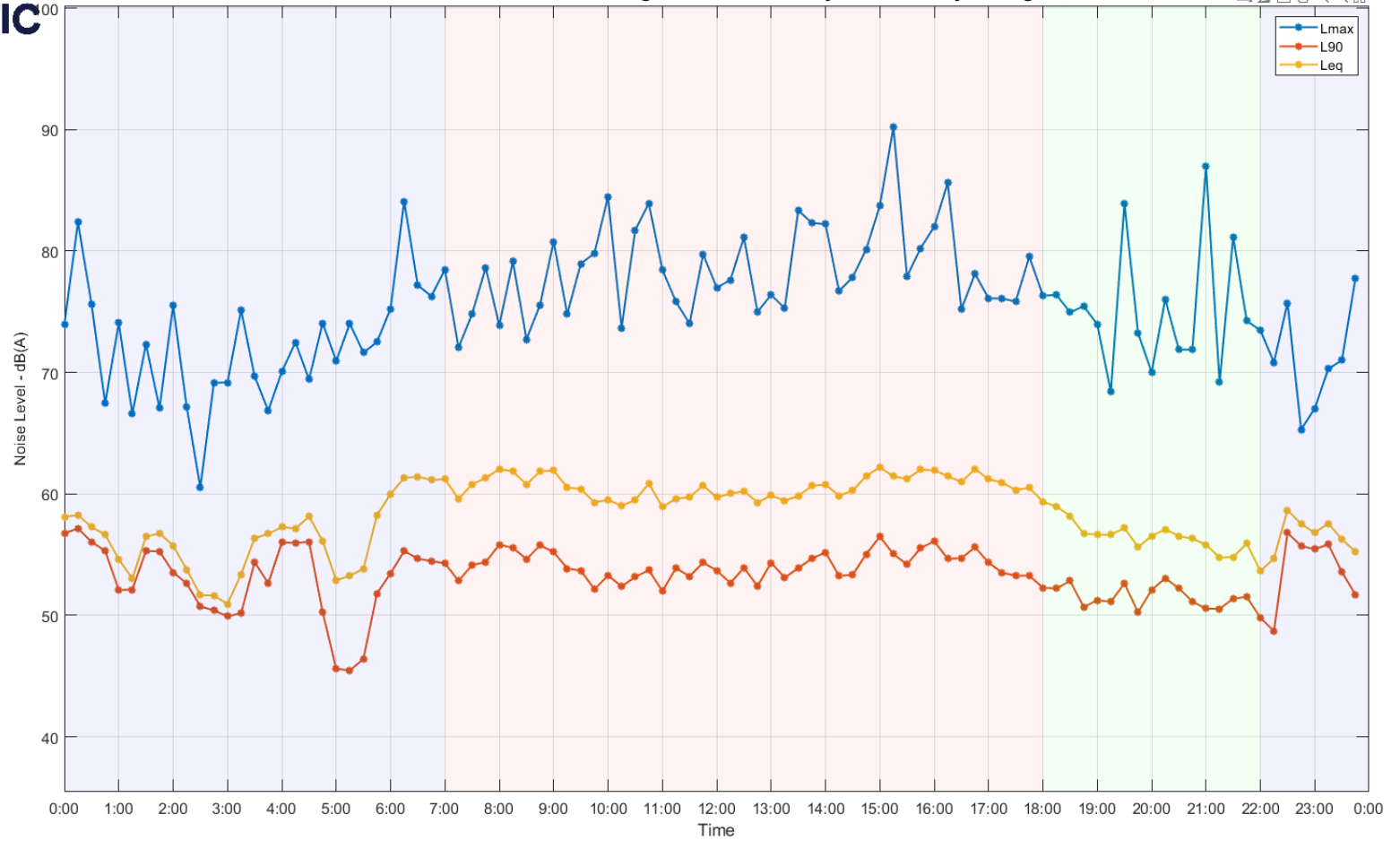


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Tuesday 09 August, 2022

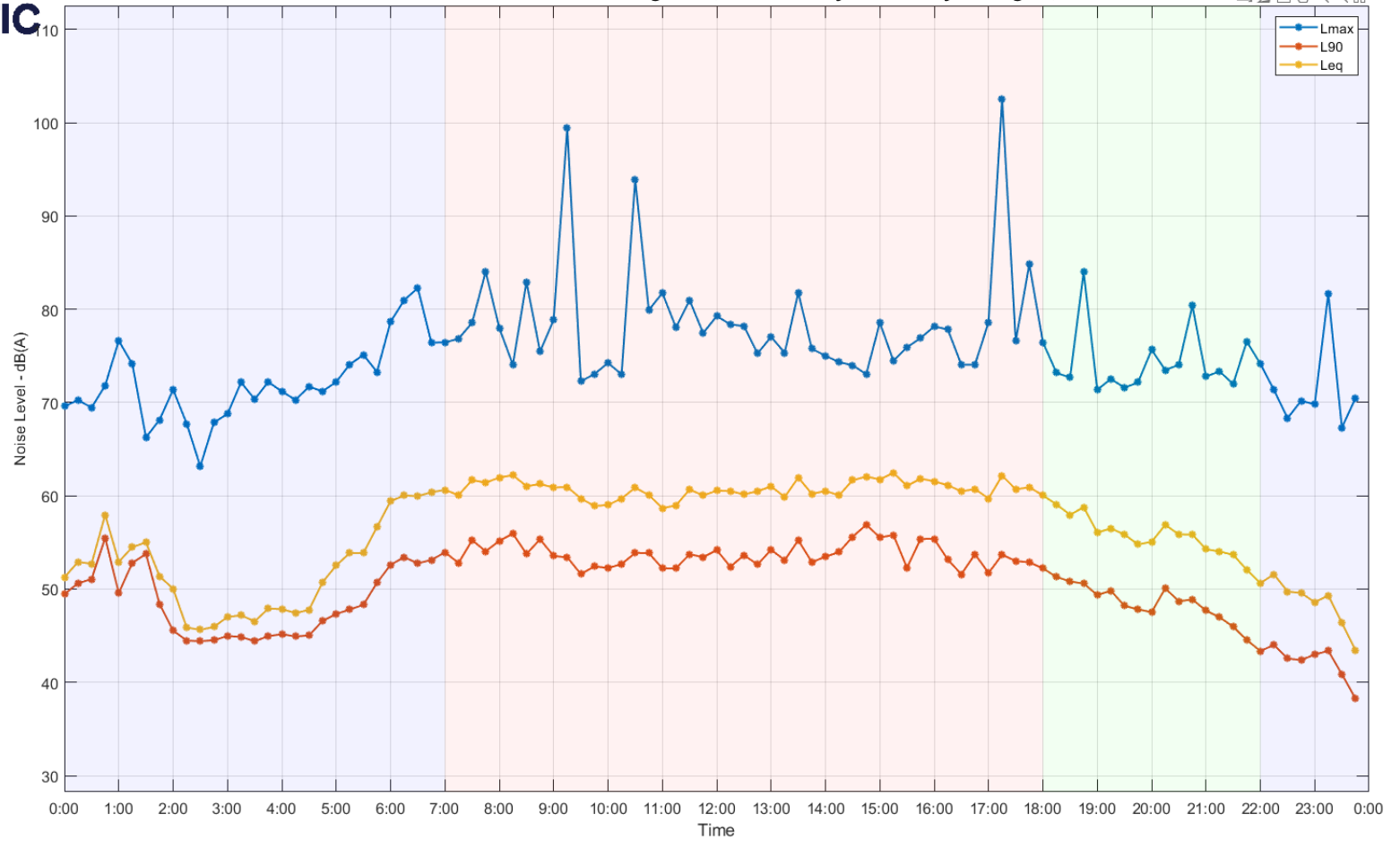




Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Wednesday 10 August, 2022

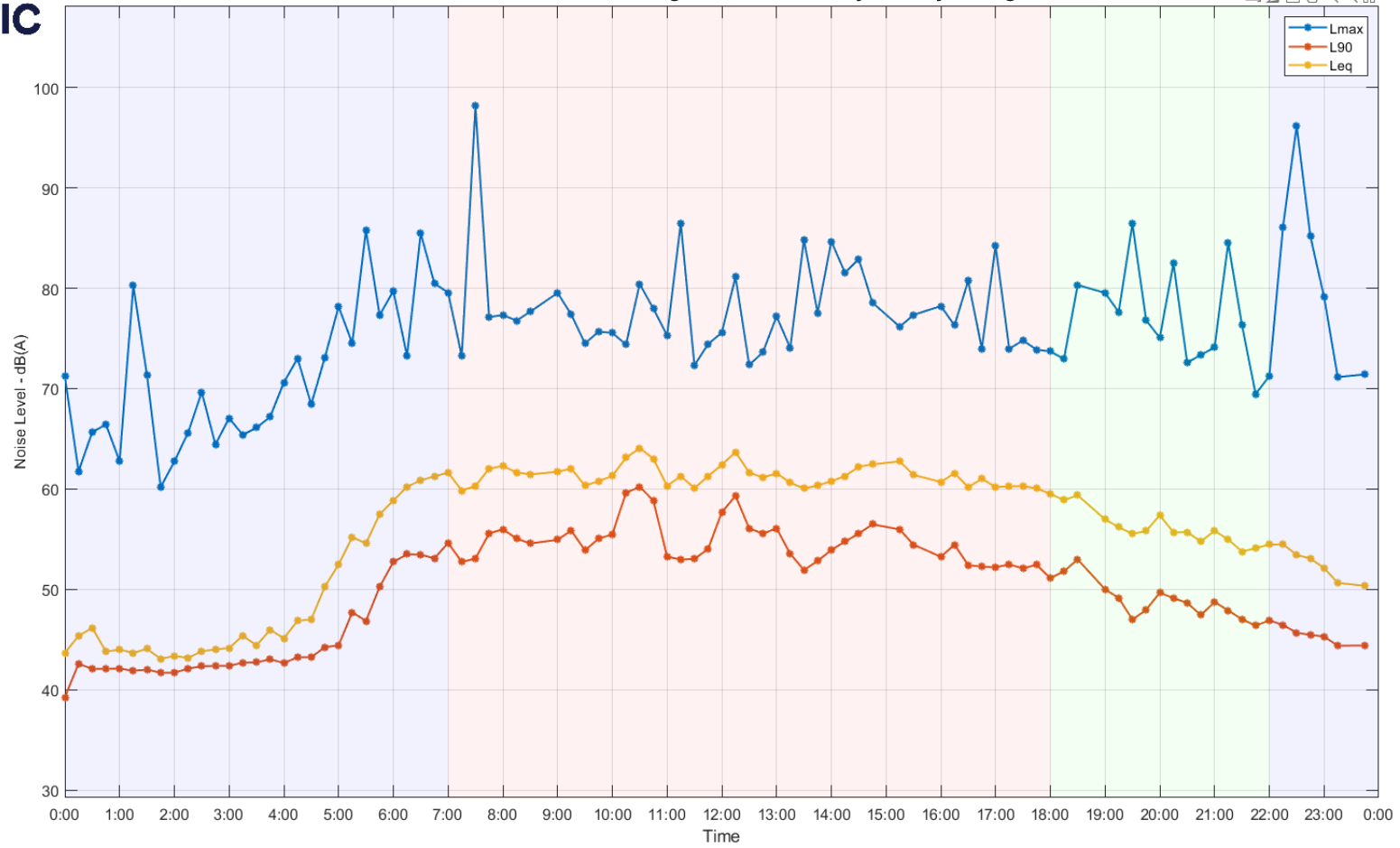


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Thursday 11 August, 2022

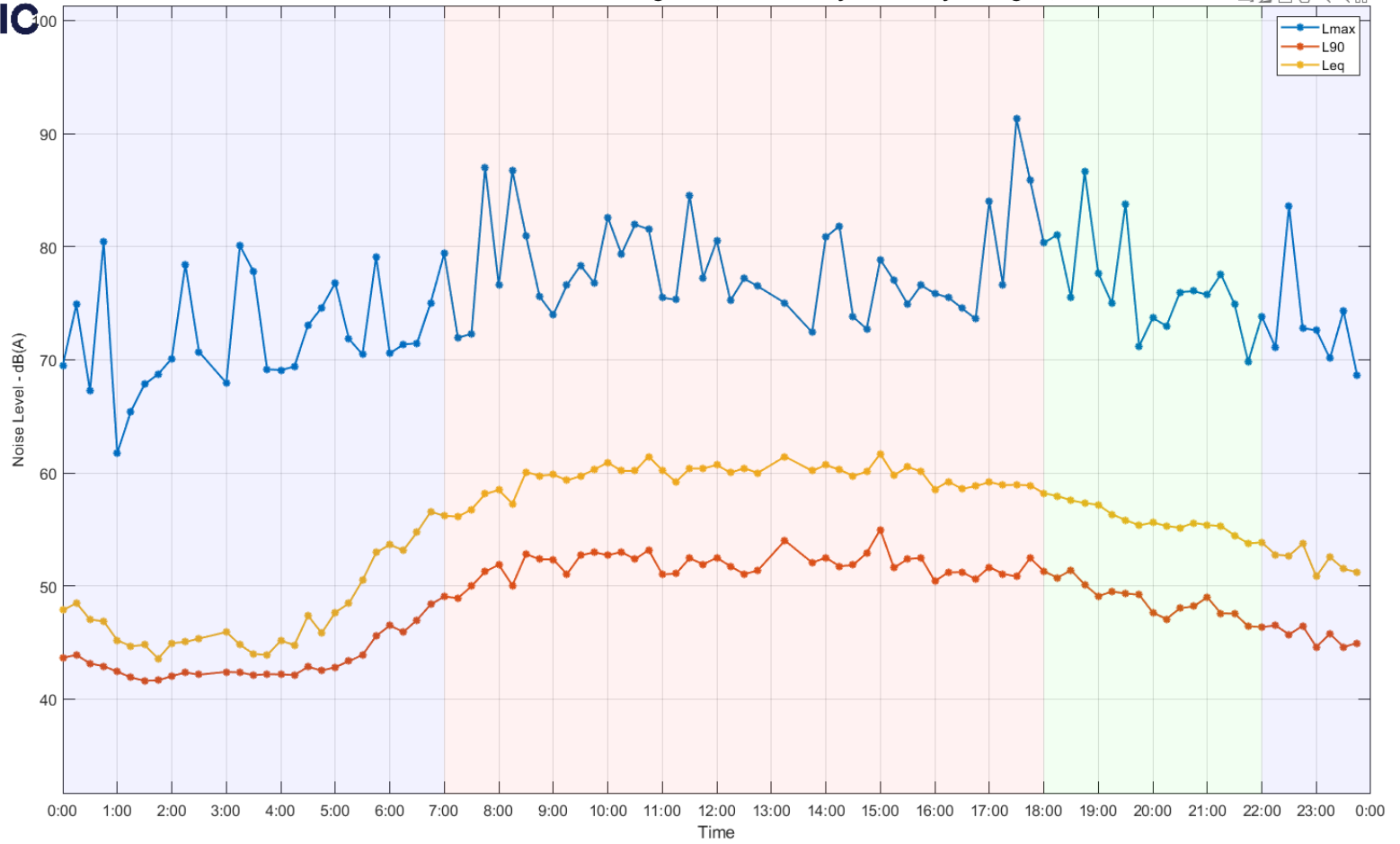




Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Friday 12 August, 2022

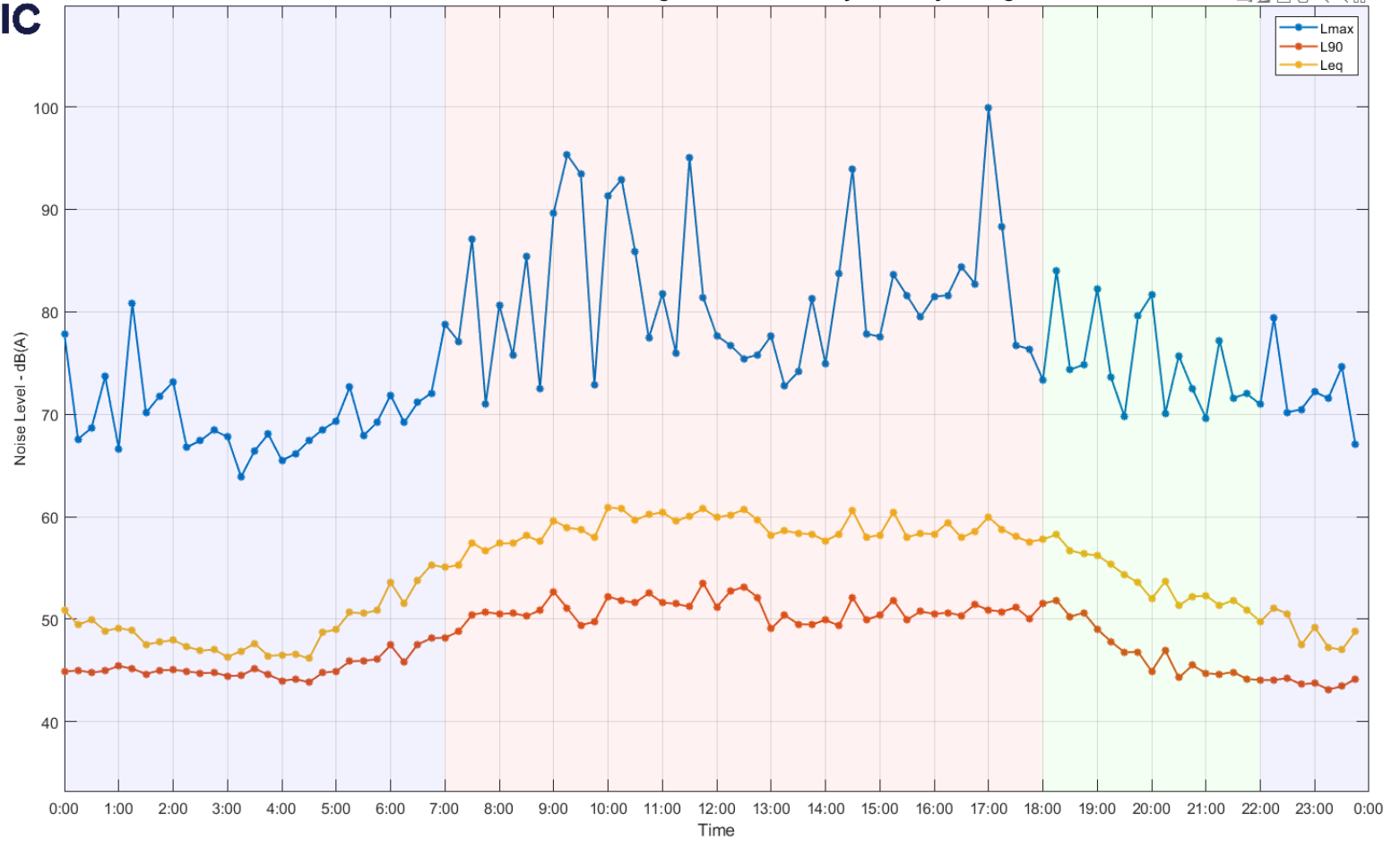


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Saturday 13 August, 2022



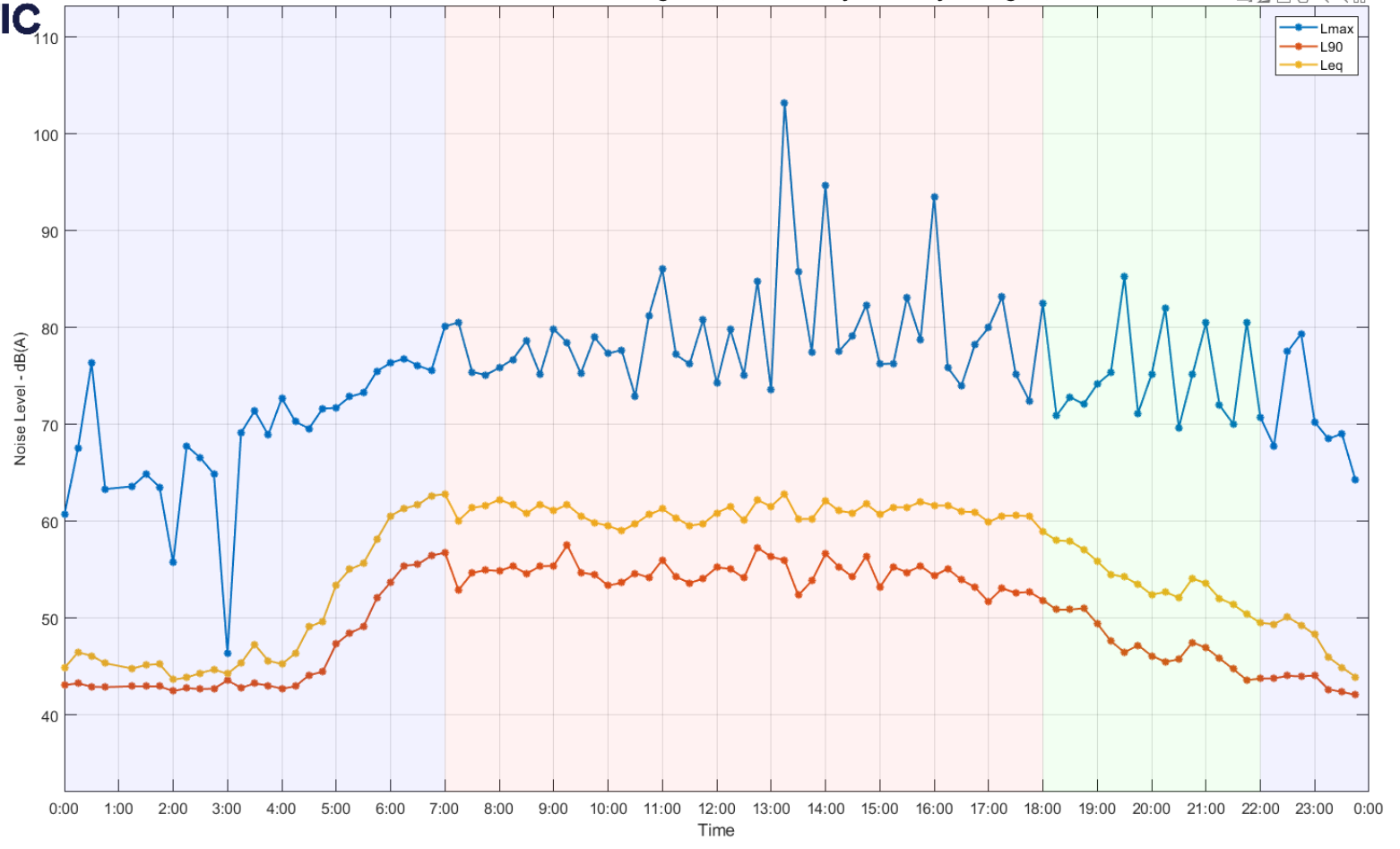


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Sunday 14 August, 2022

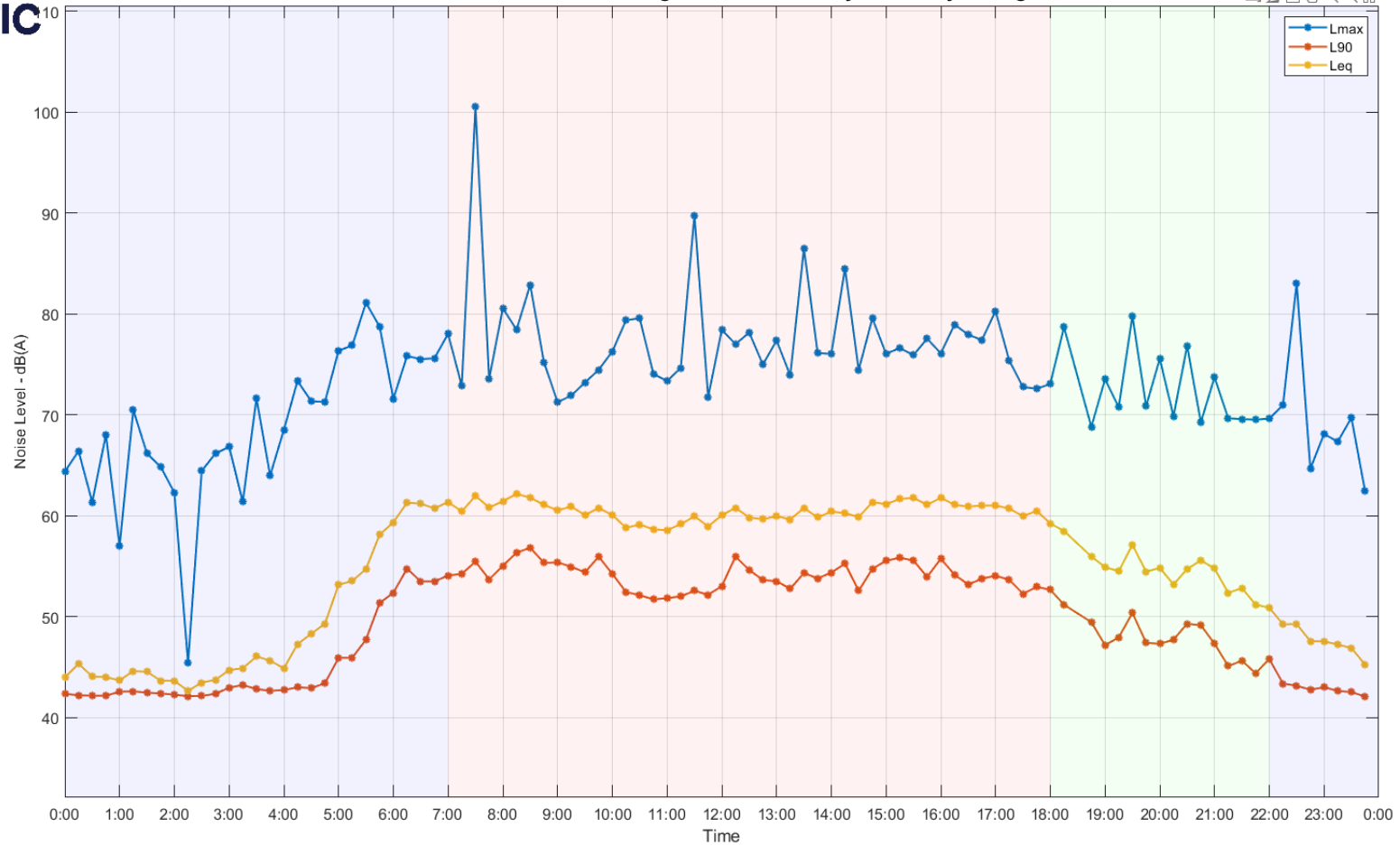




Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Monday 15 August, 2022

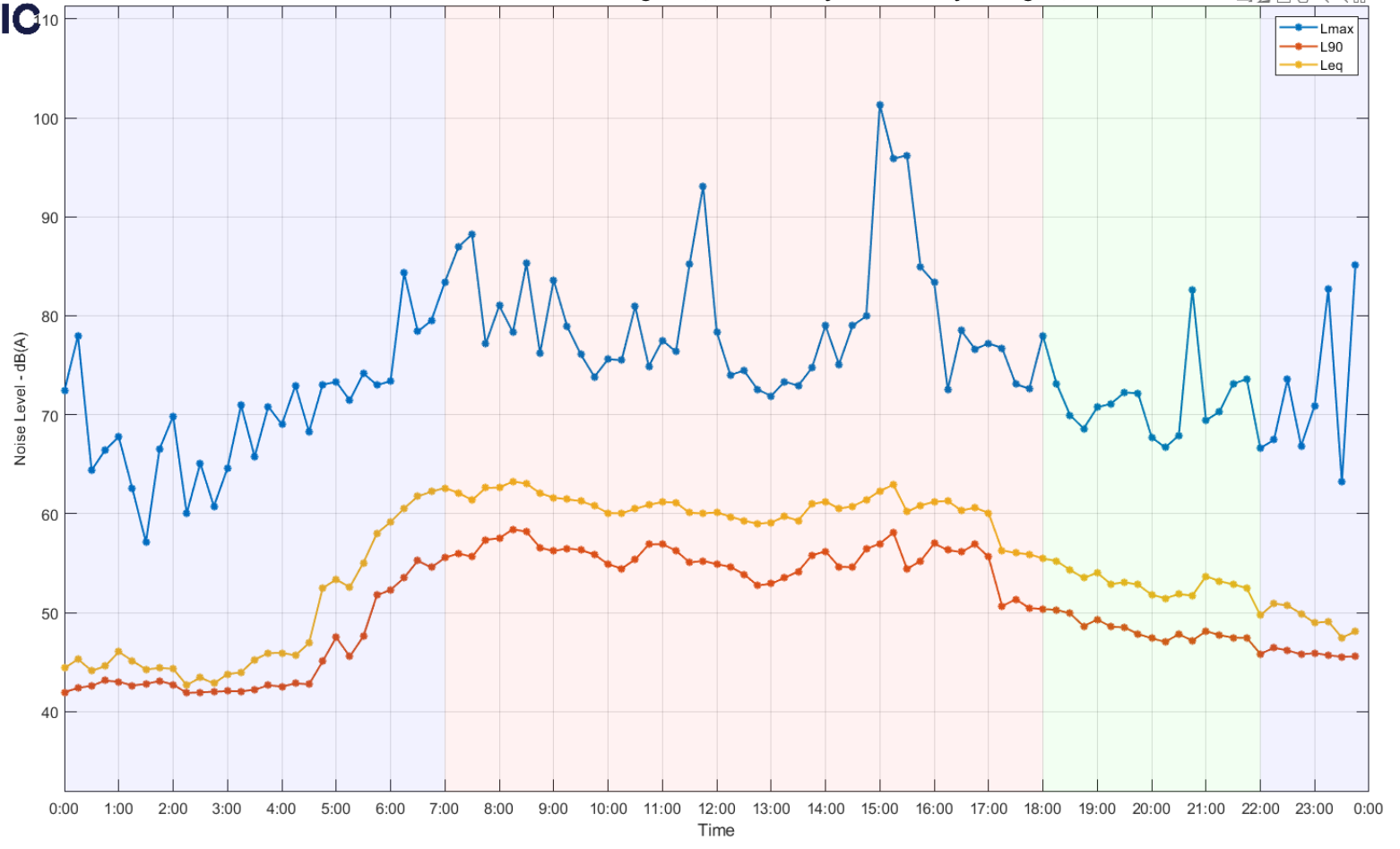


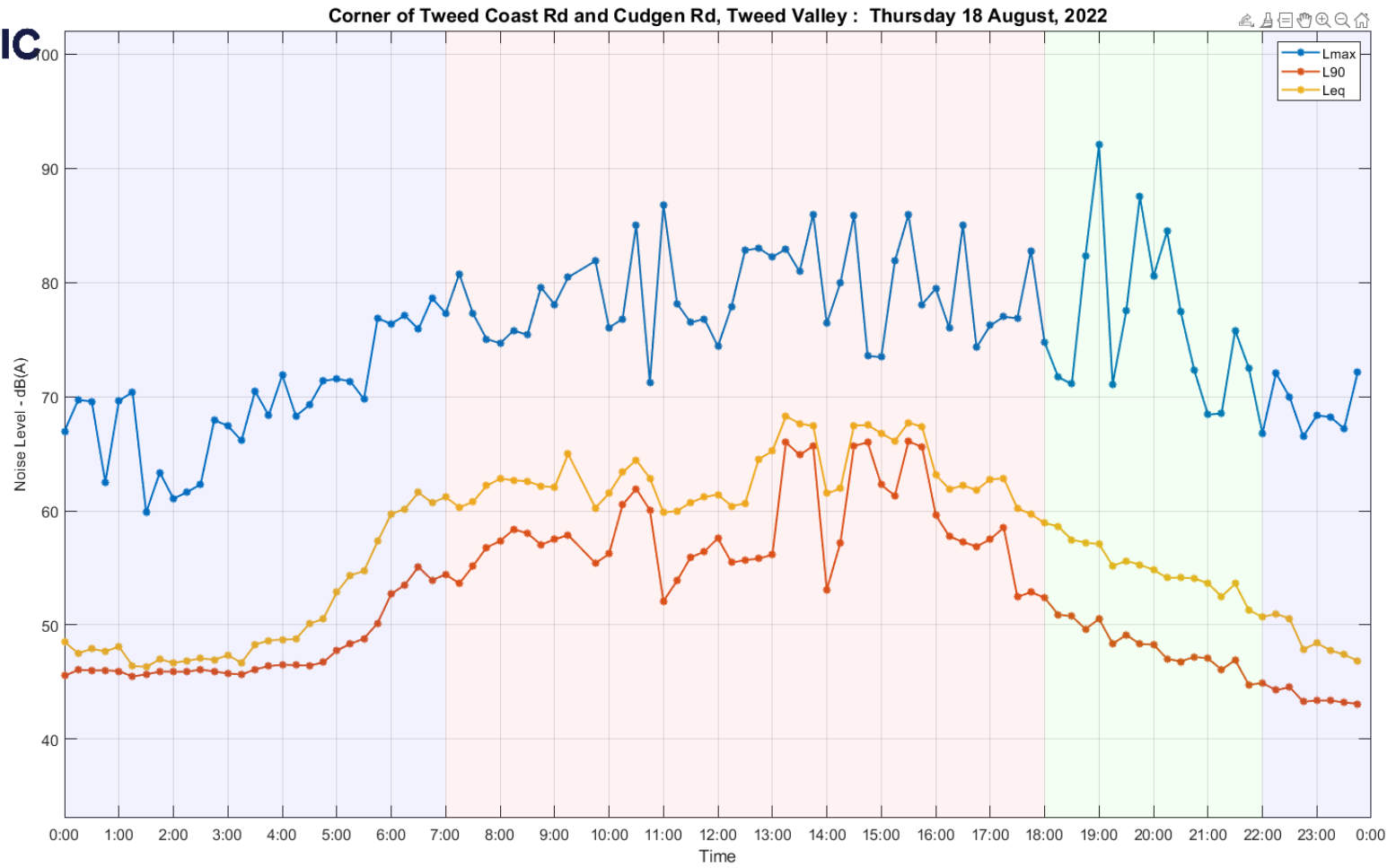
Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Tuesday 16 August, 2022



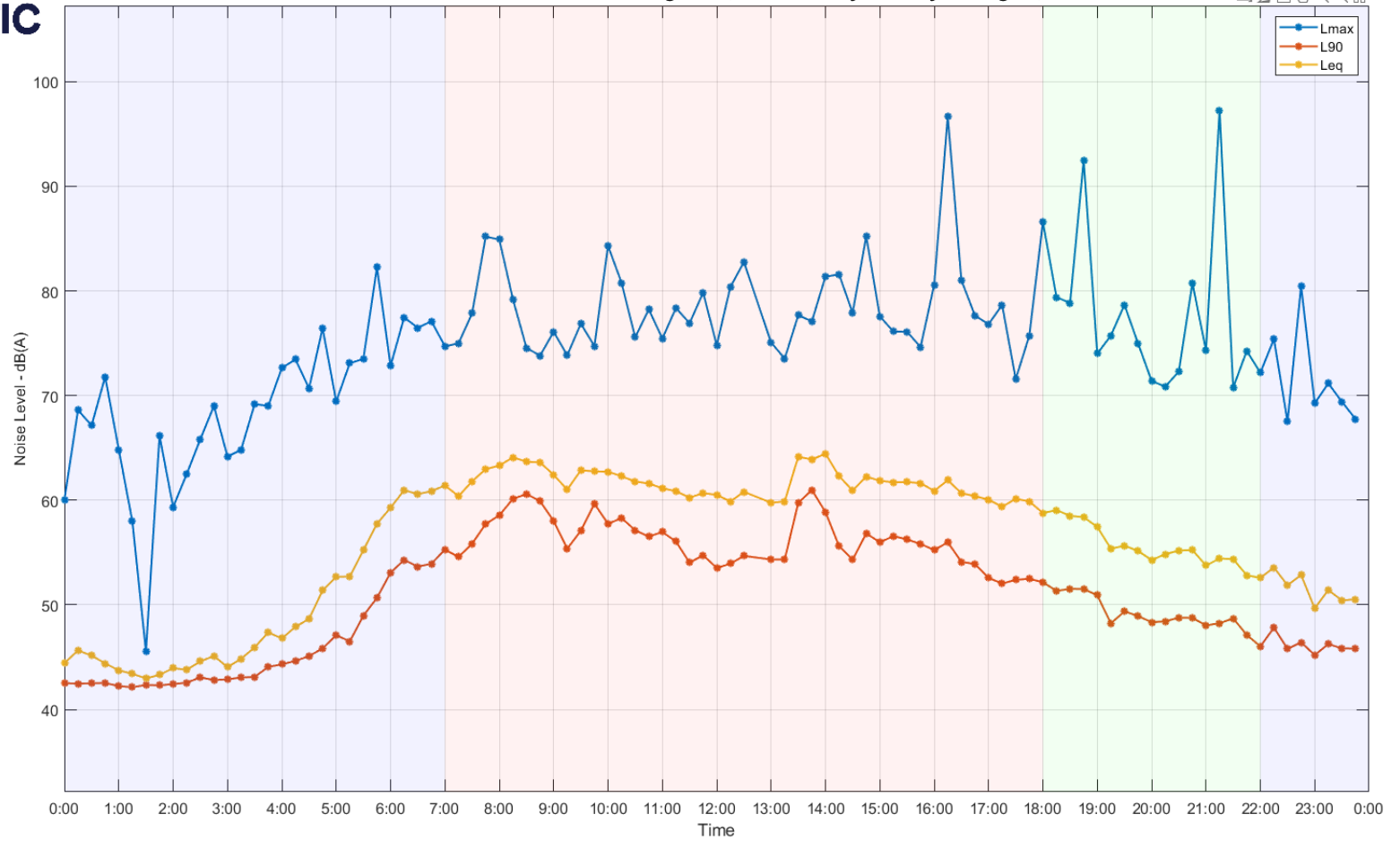


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Wednesday 17 August, 2022



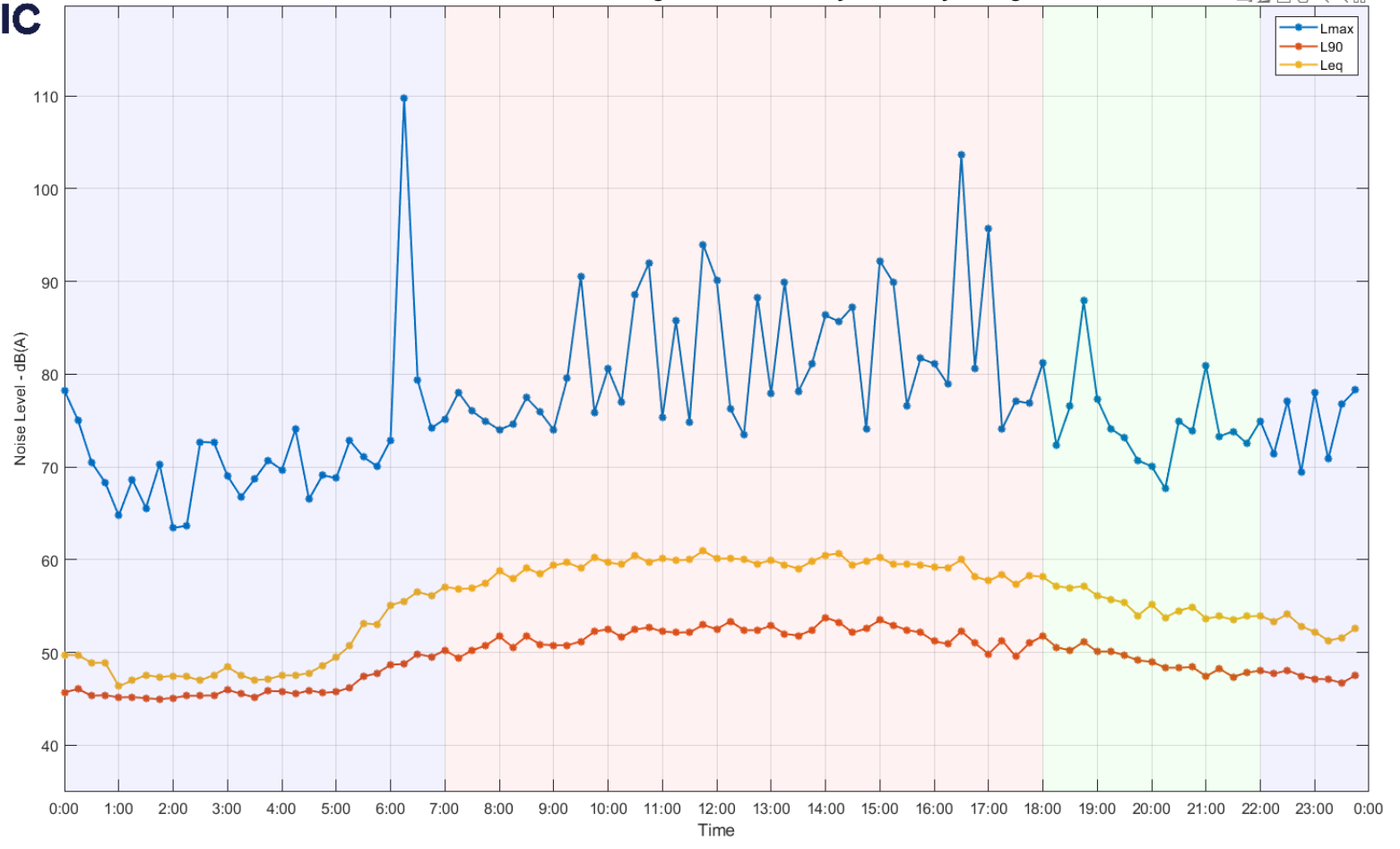


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Friday 19 August, 2022

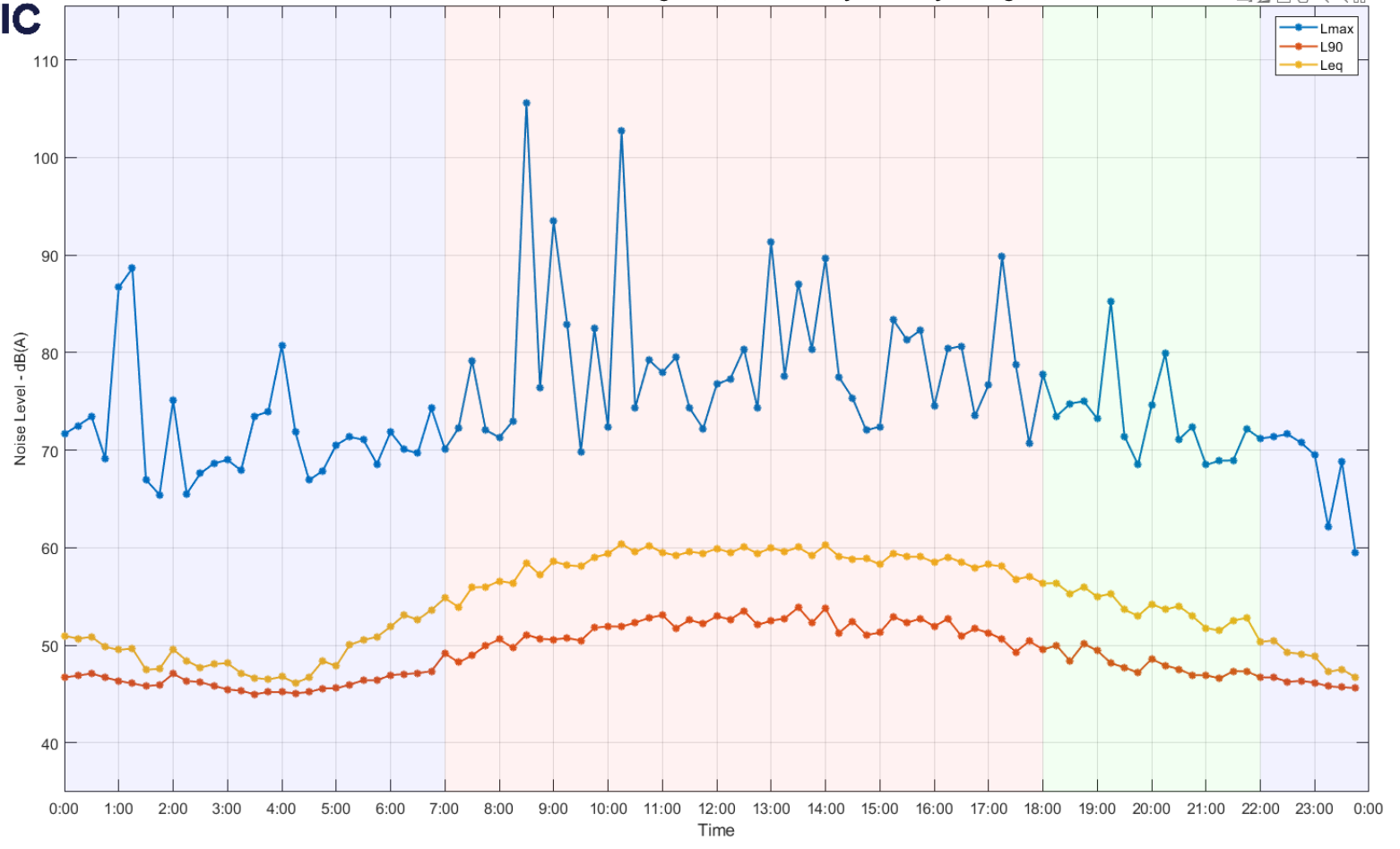




Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Saturday 20 August, 2022

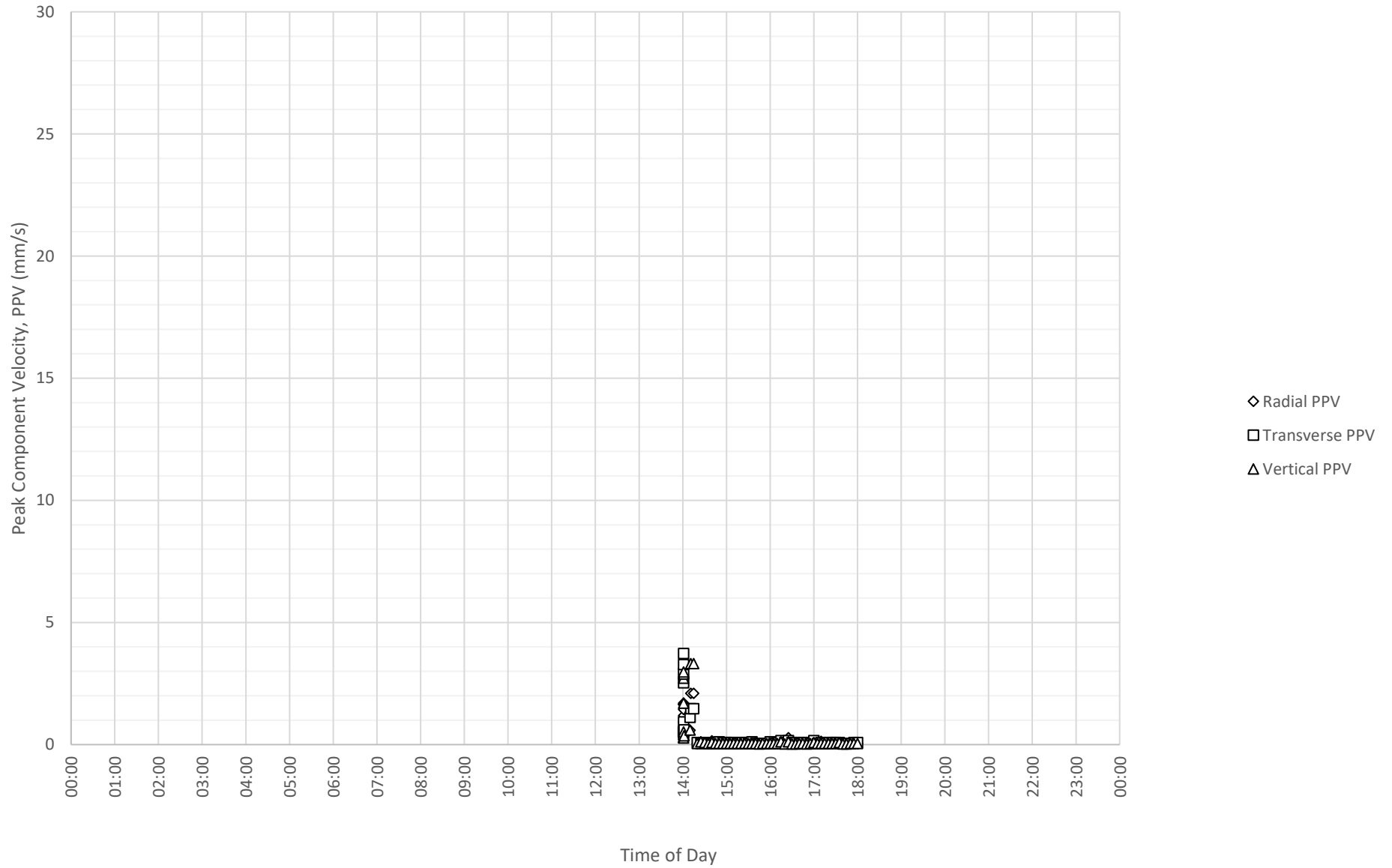


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Sunday 21 August, 2022

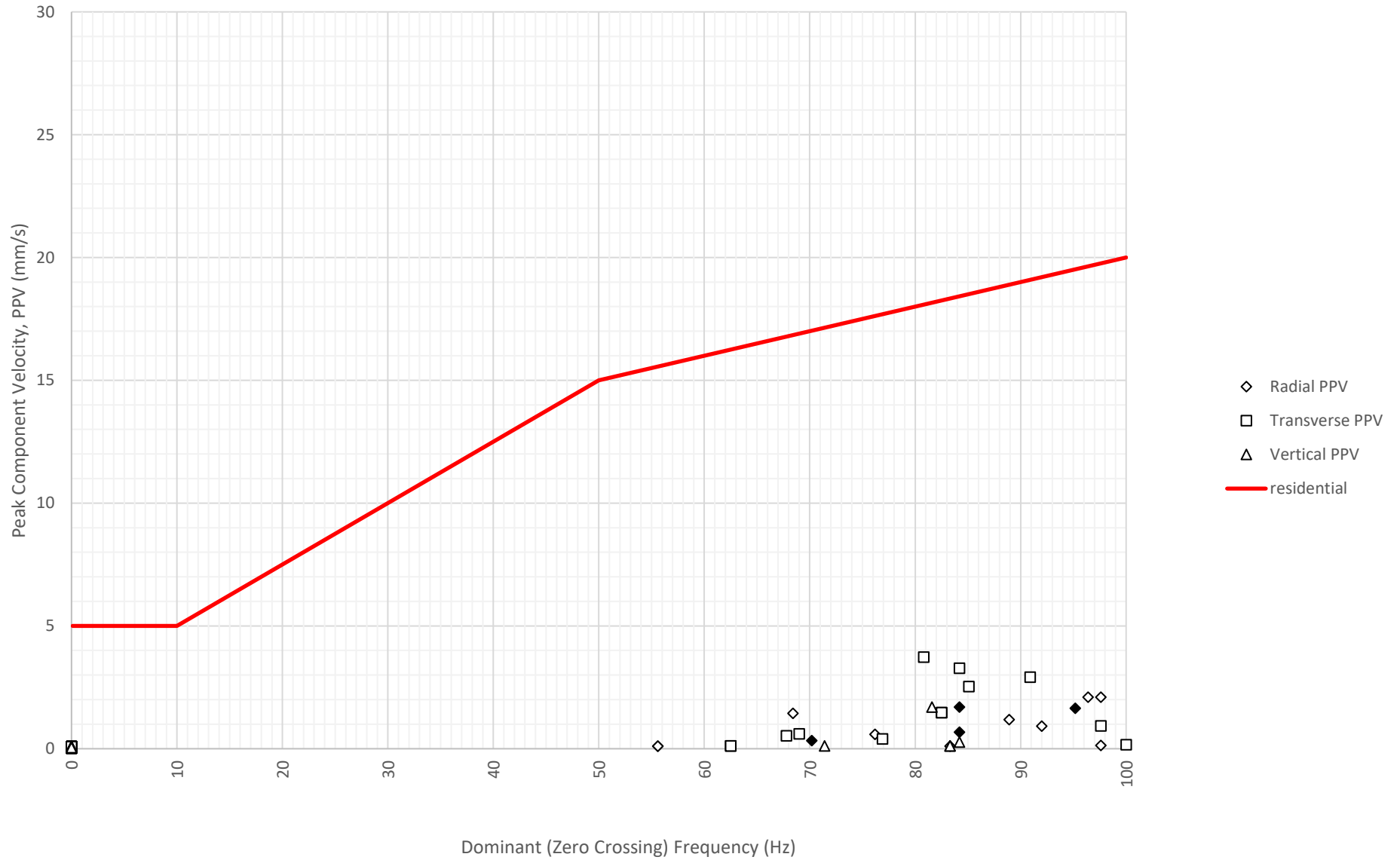


APPENDIX 2 – VIBRATION MONITORING RESULTS

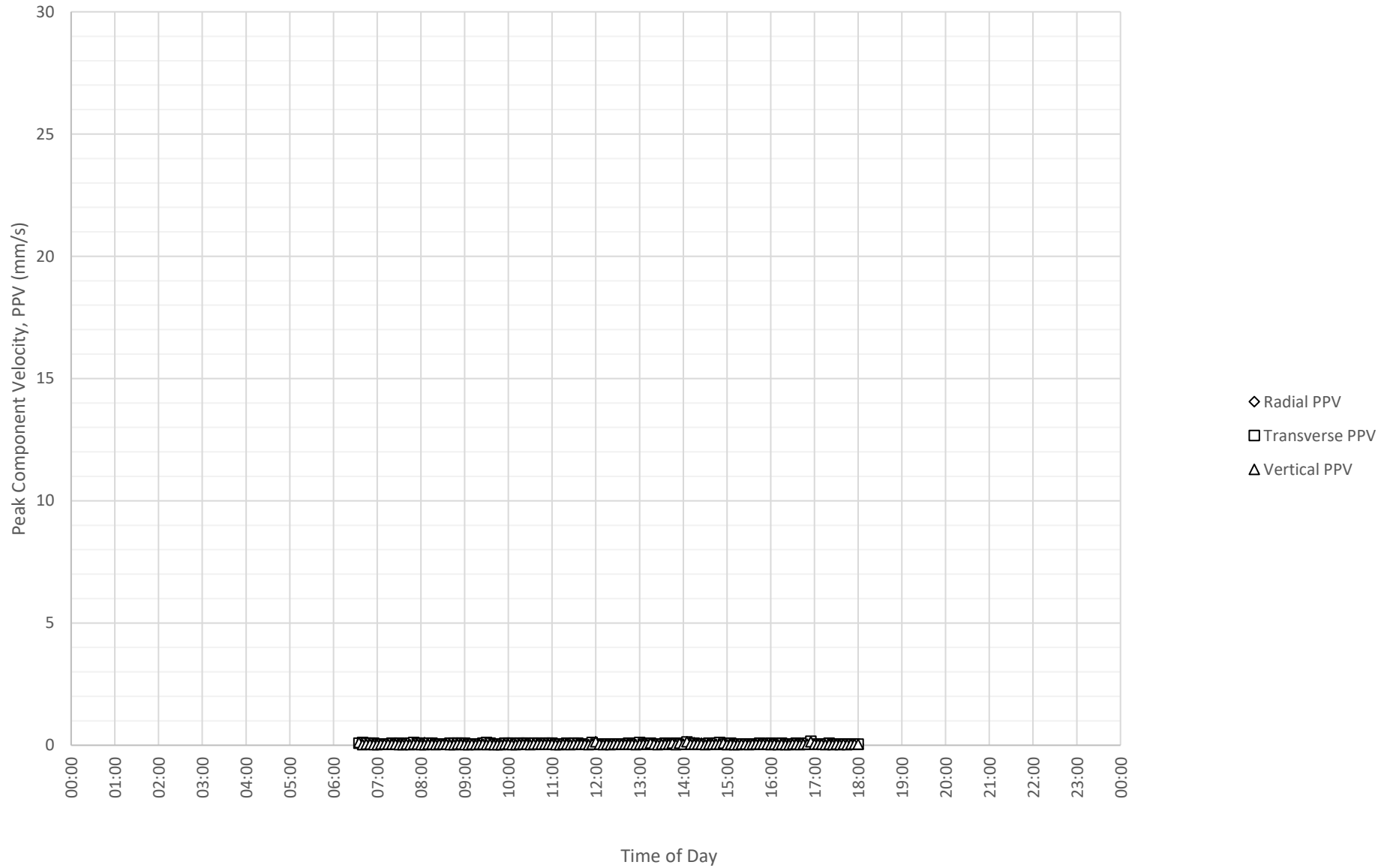
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 22-07-2022



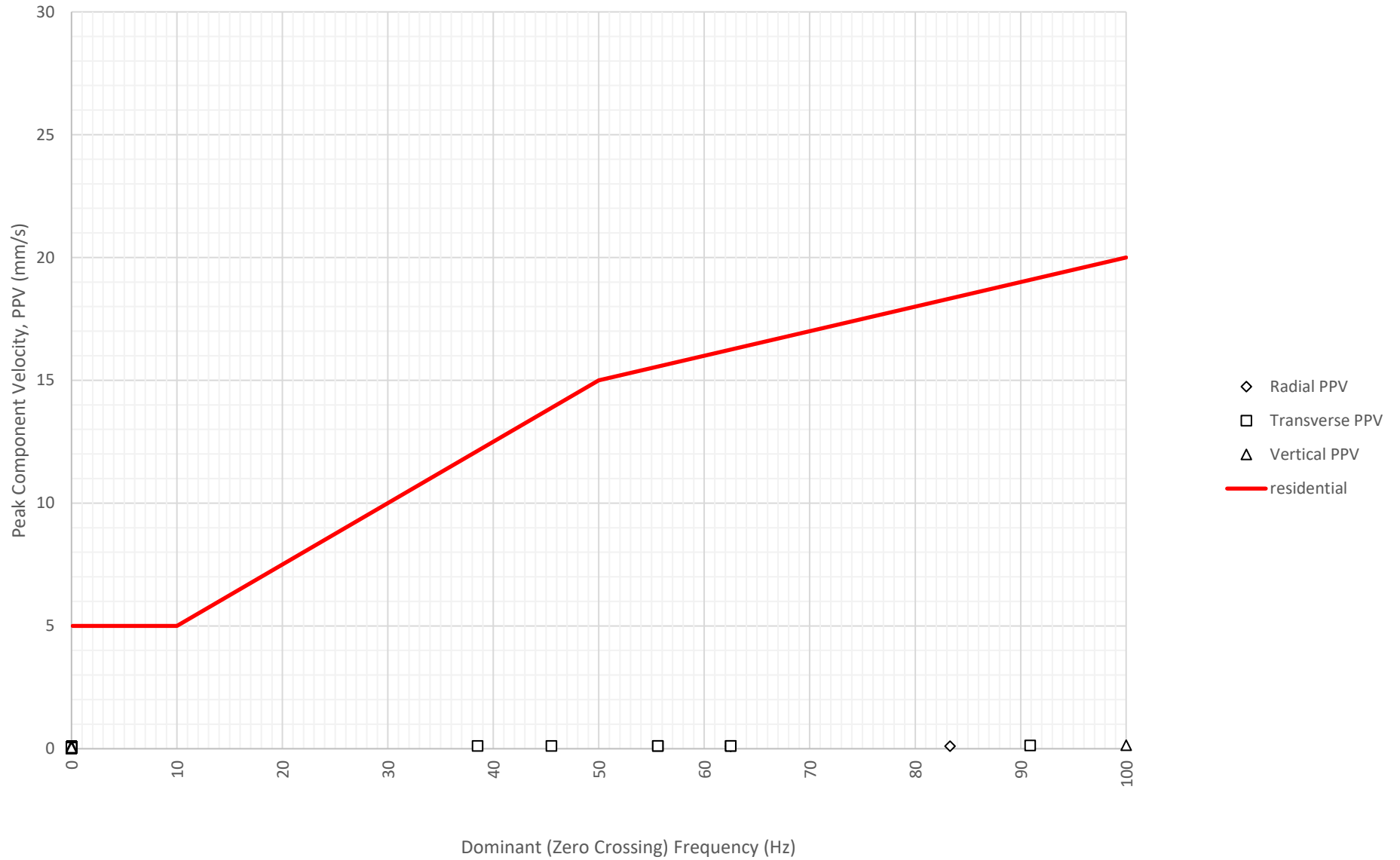
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 22-07-2022



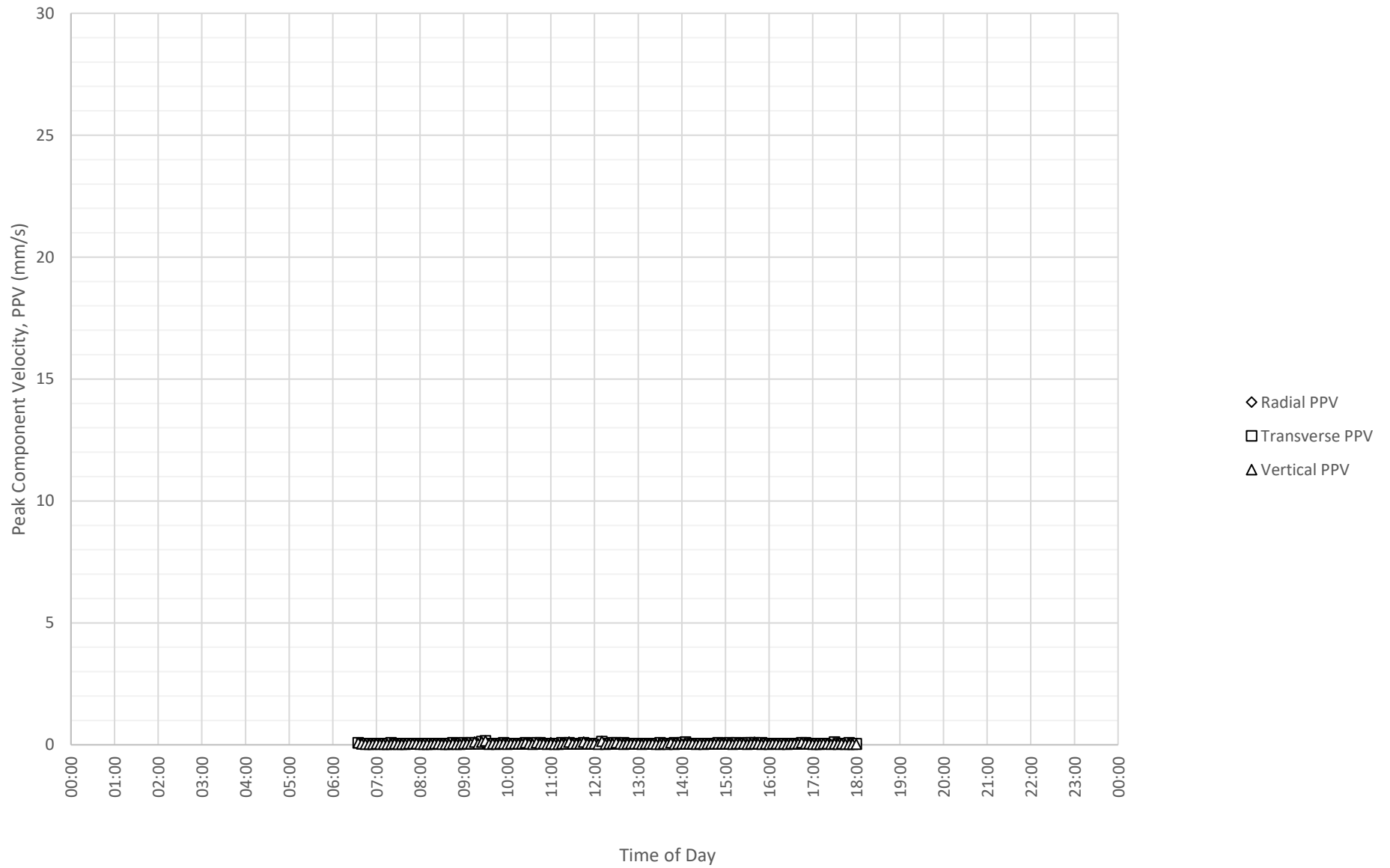
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 23-07-2022



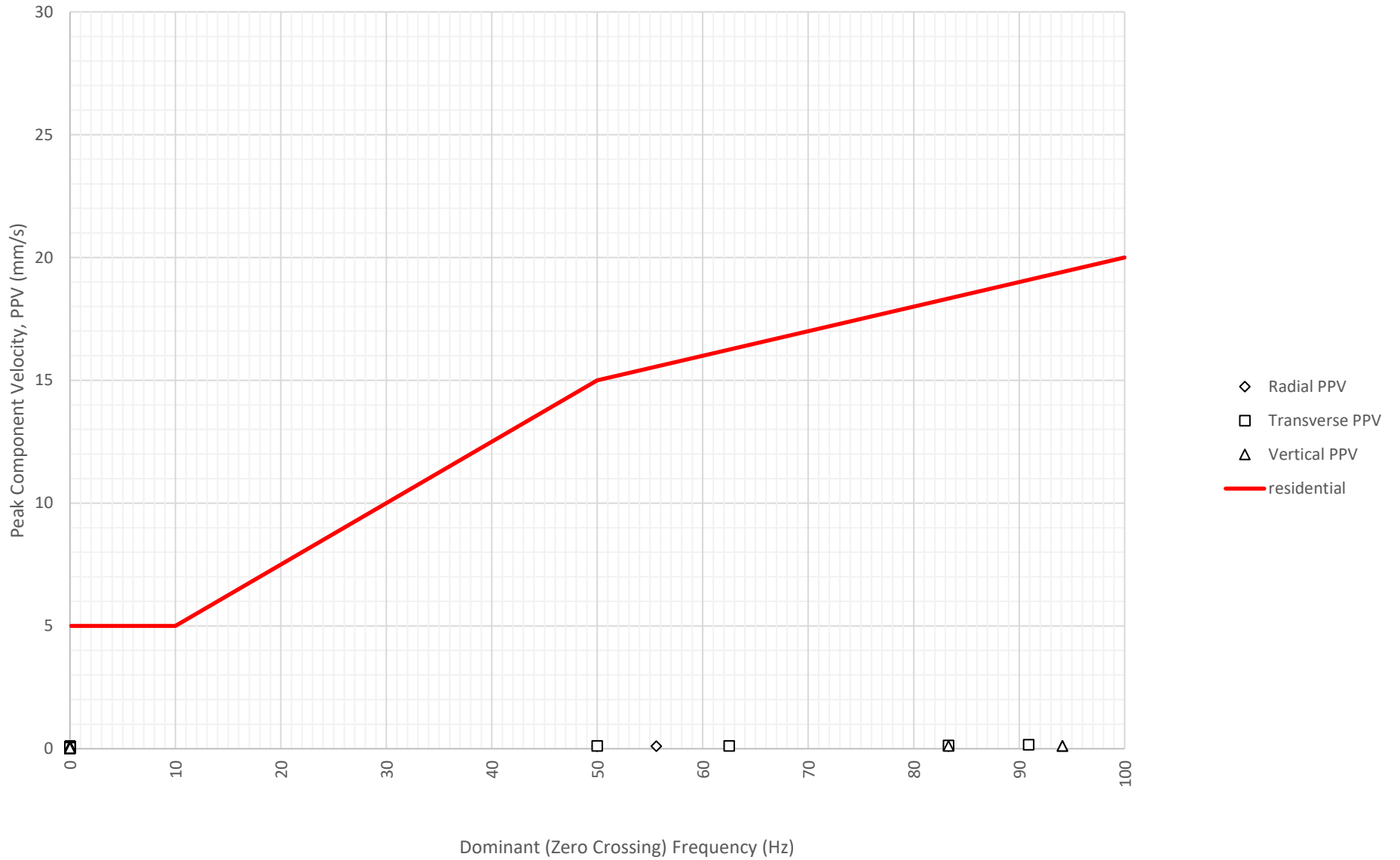
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on
23-07-2022



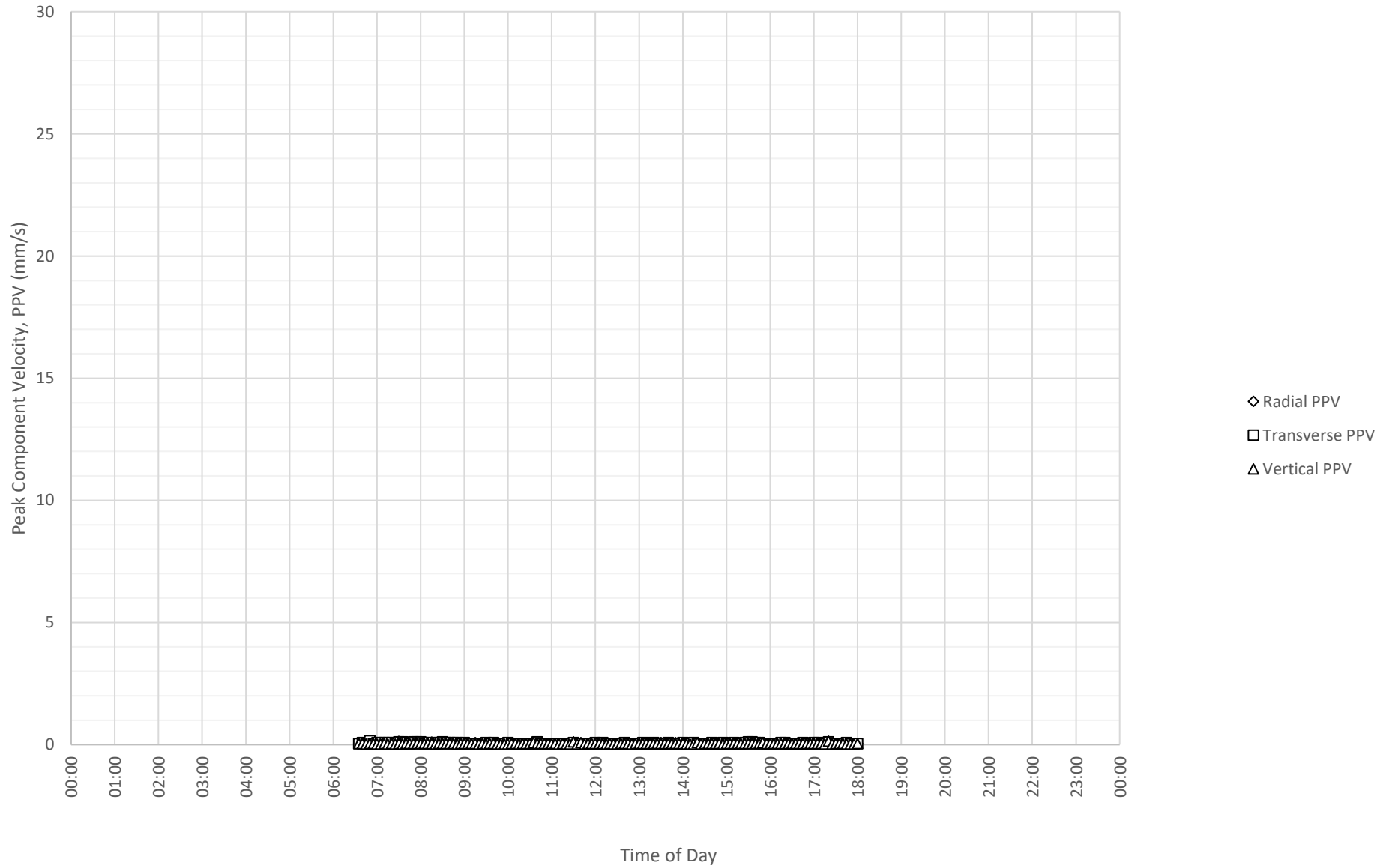
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 24-07-2022



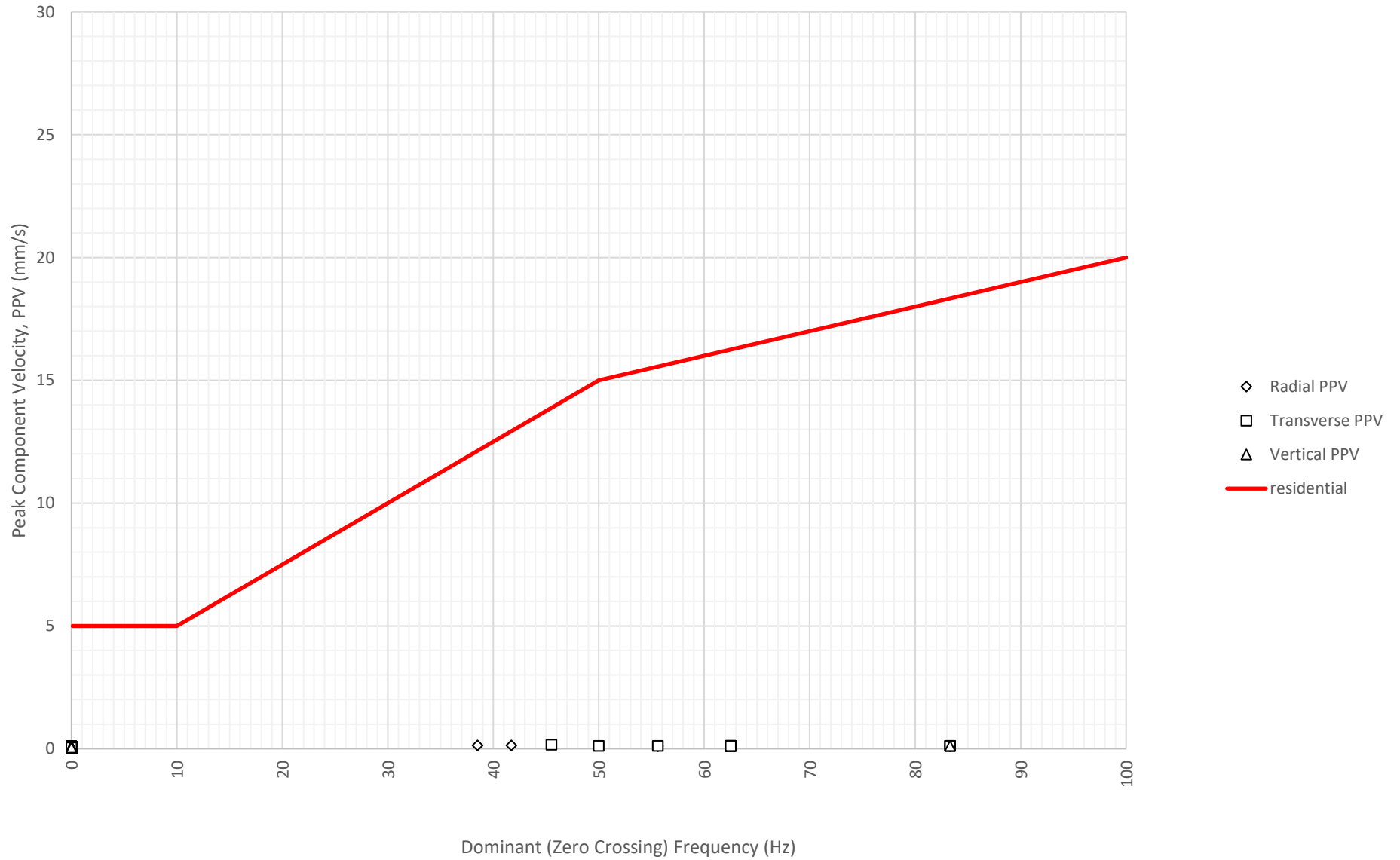
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 24-07-2022



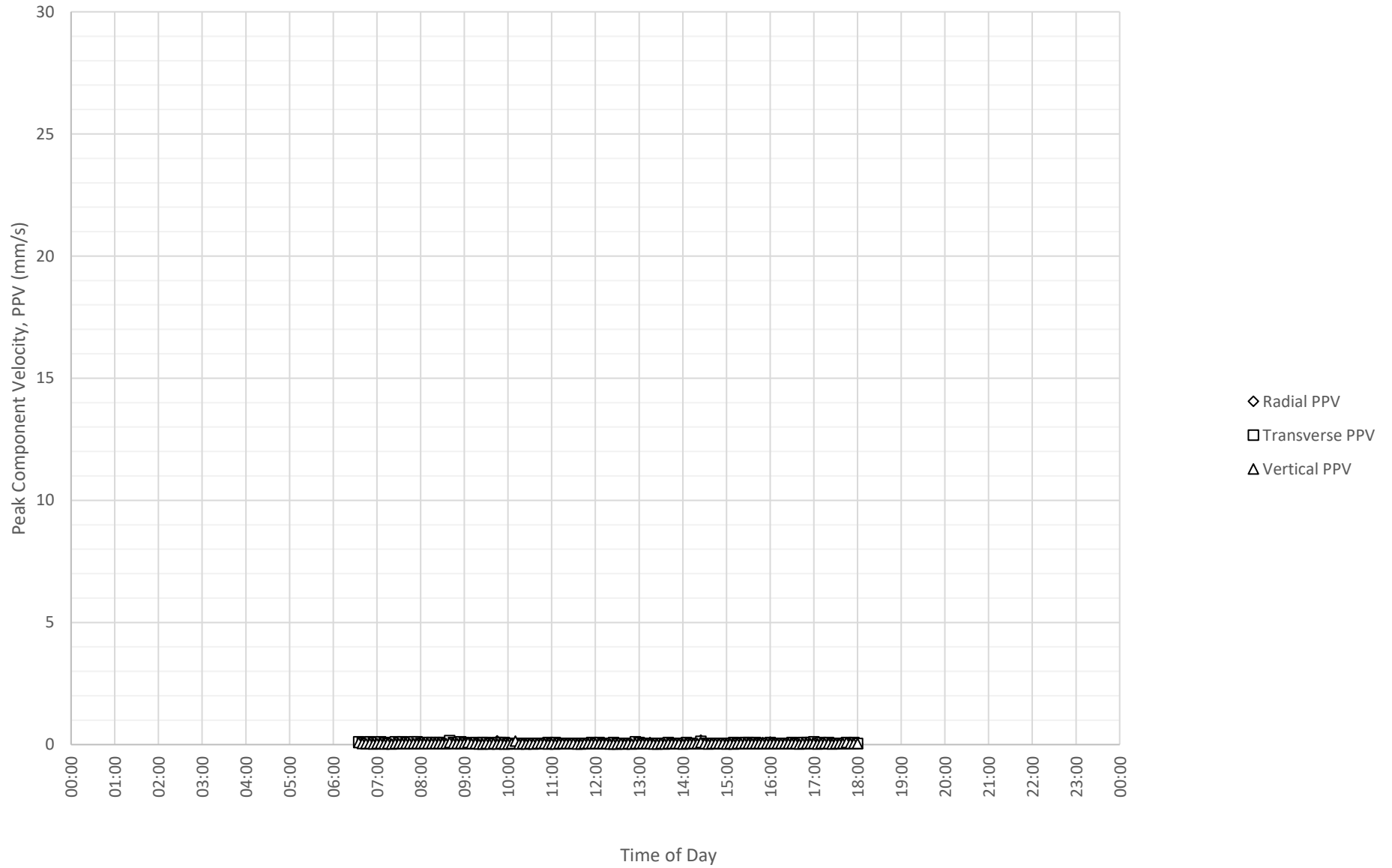
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 25-07-2022



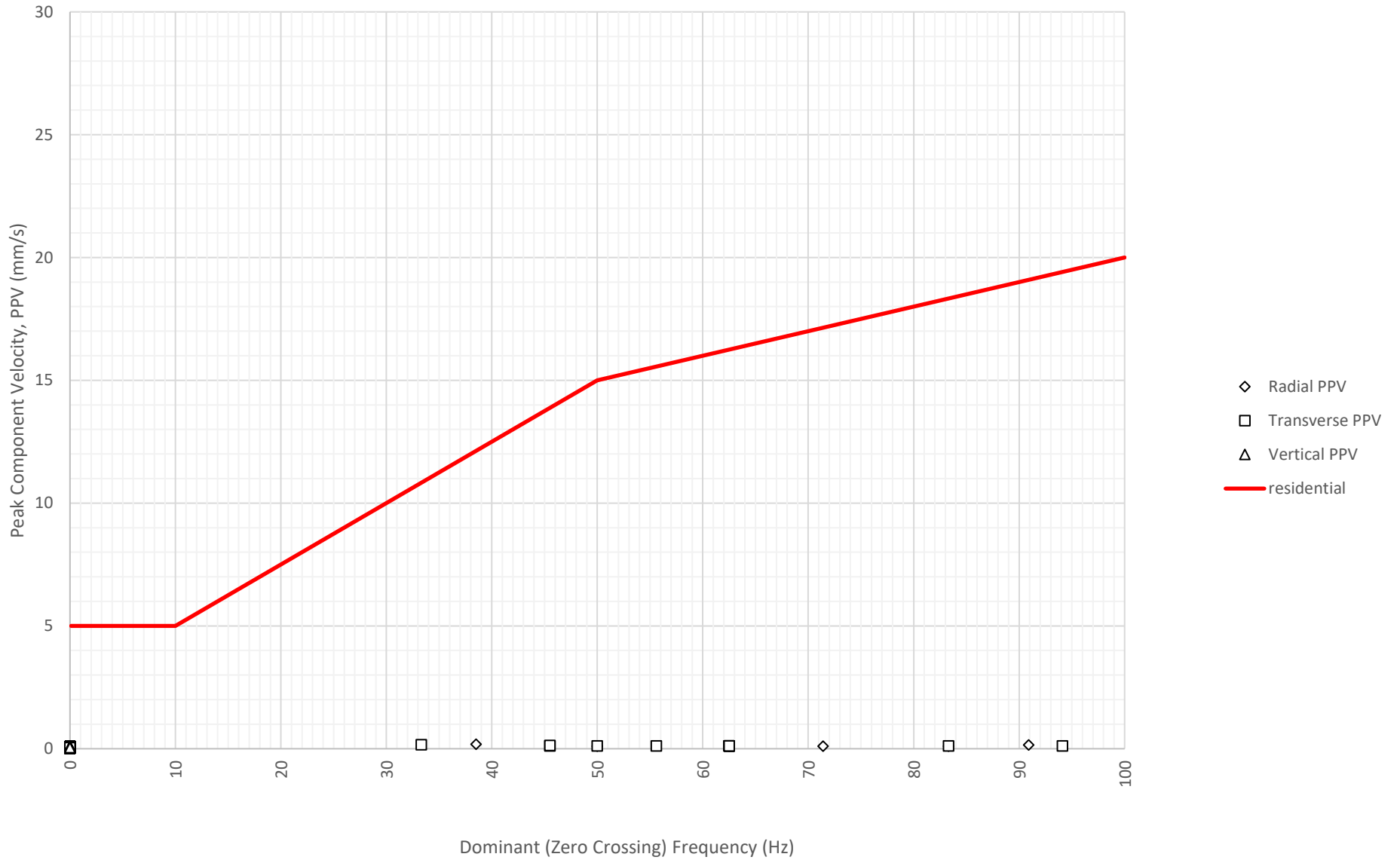
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 25-07-2022



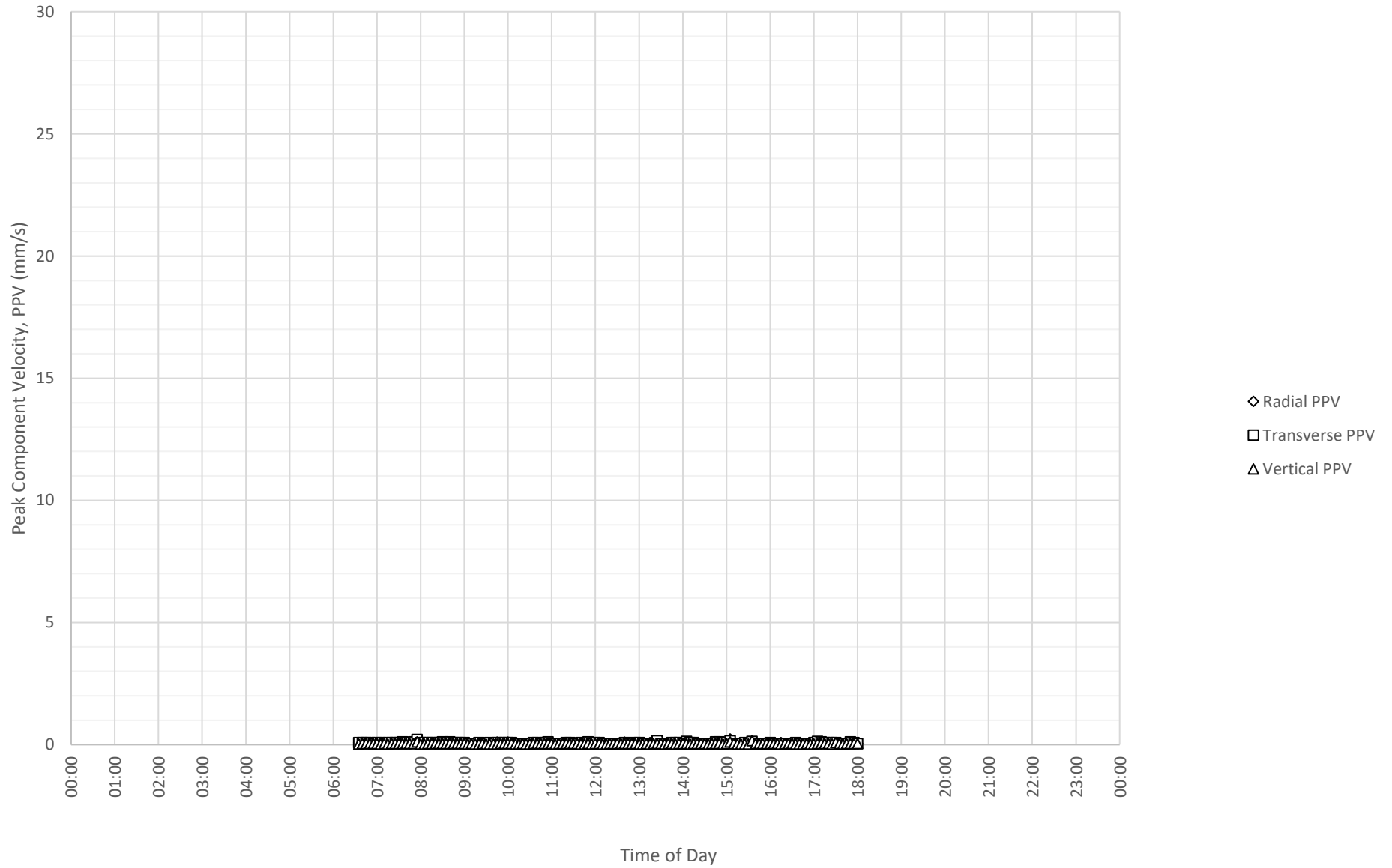
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 26-07-2022



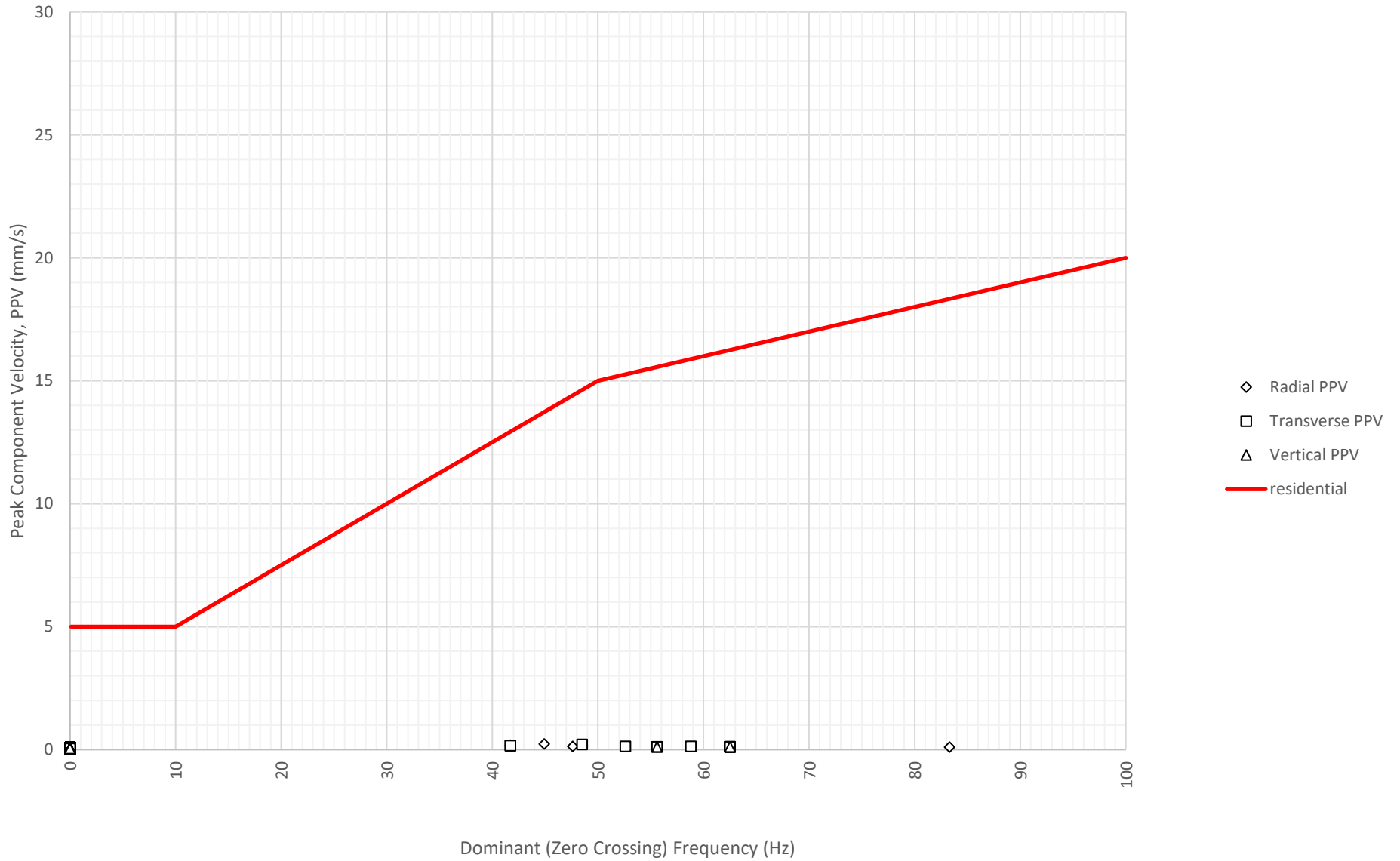
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 26-07-2022



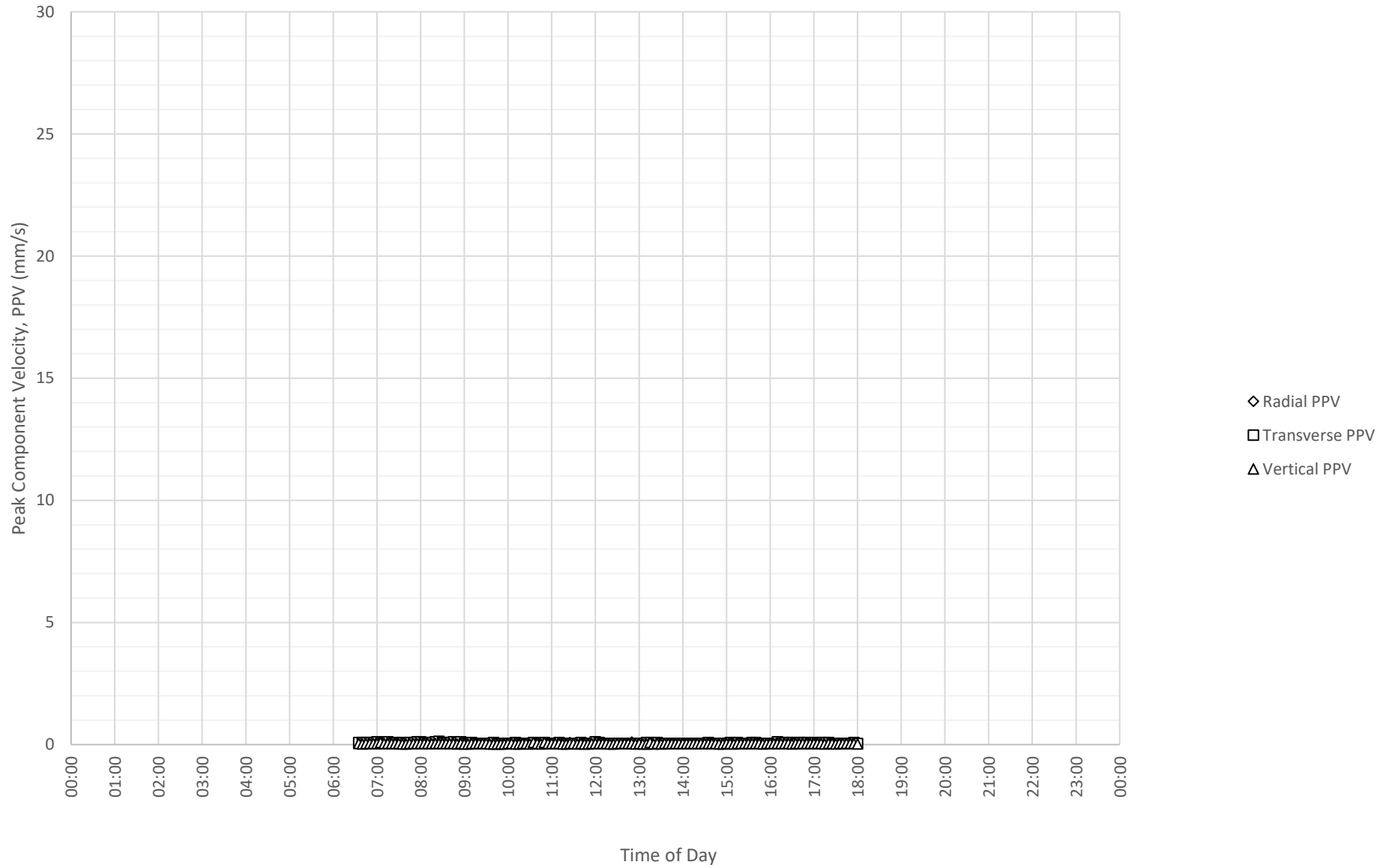
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 27-07-2022



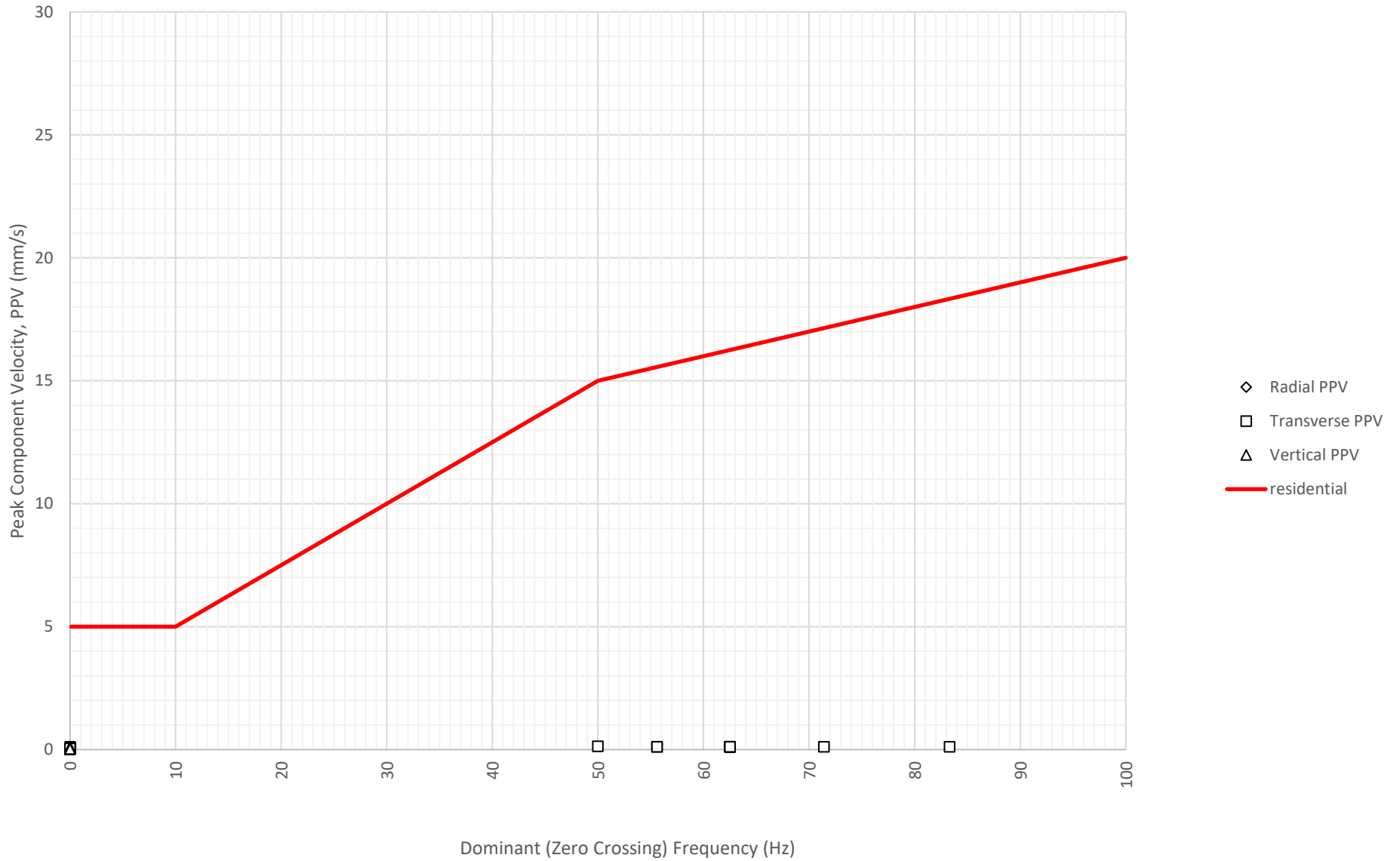
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 27-07-2022



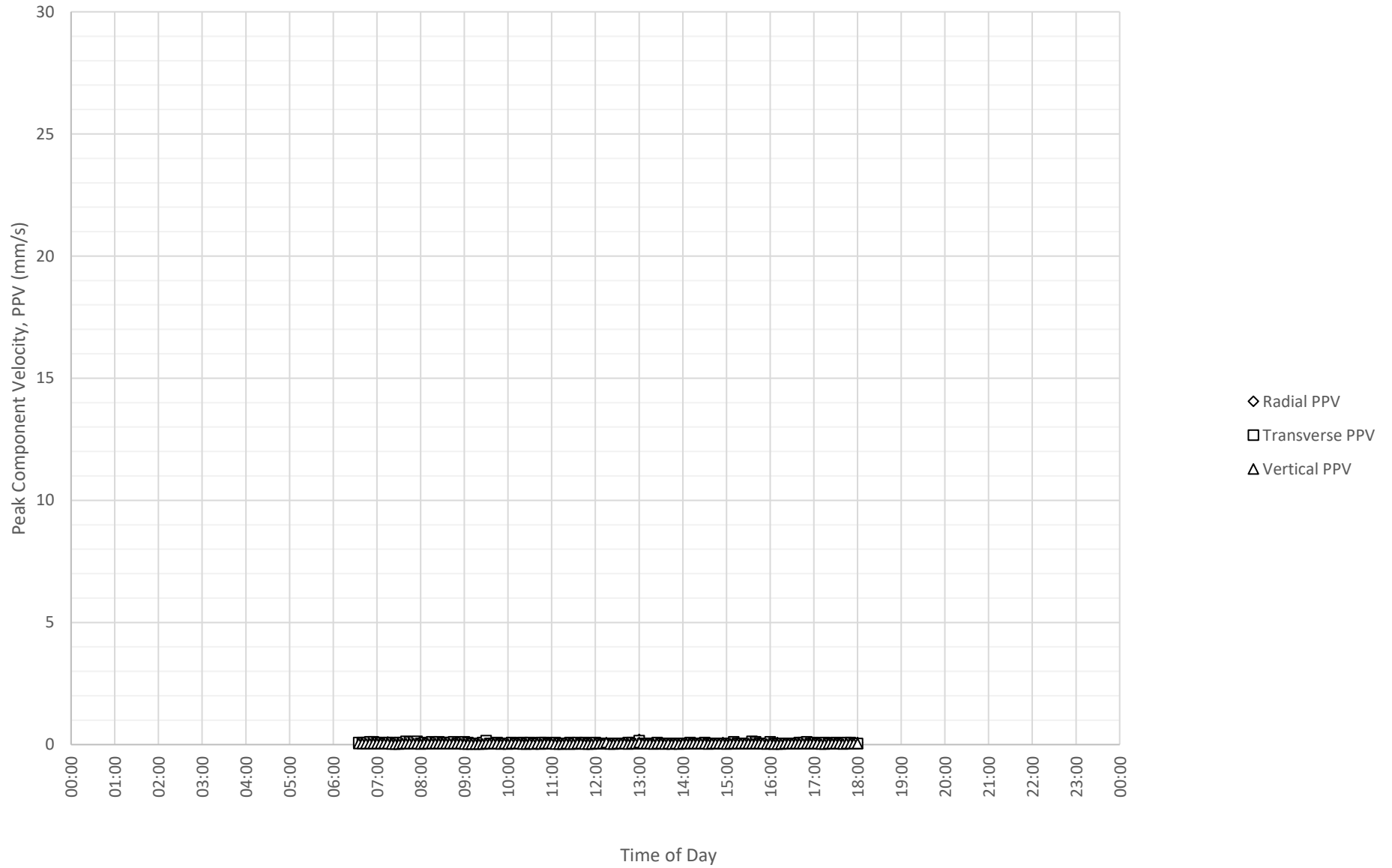
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 28-07-2022



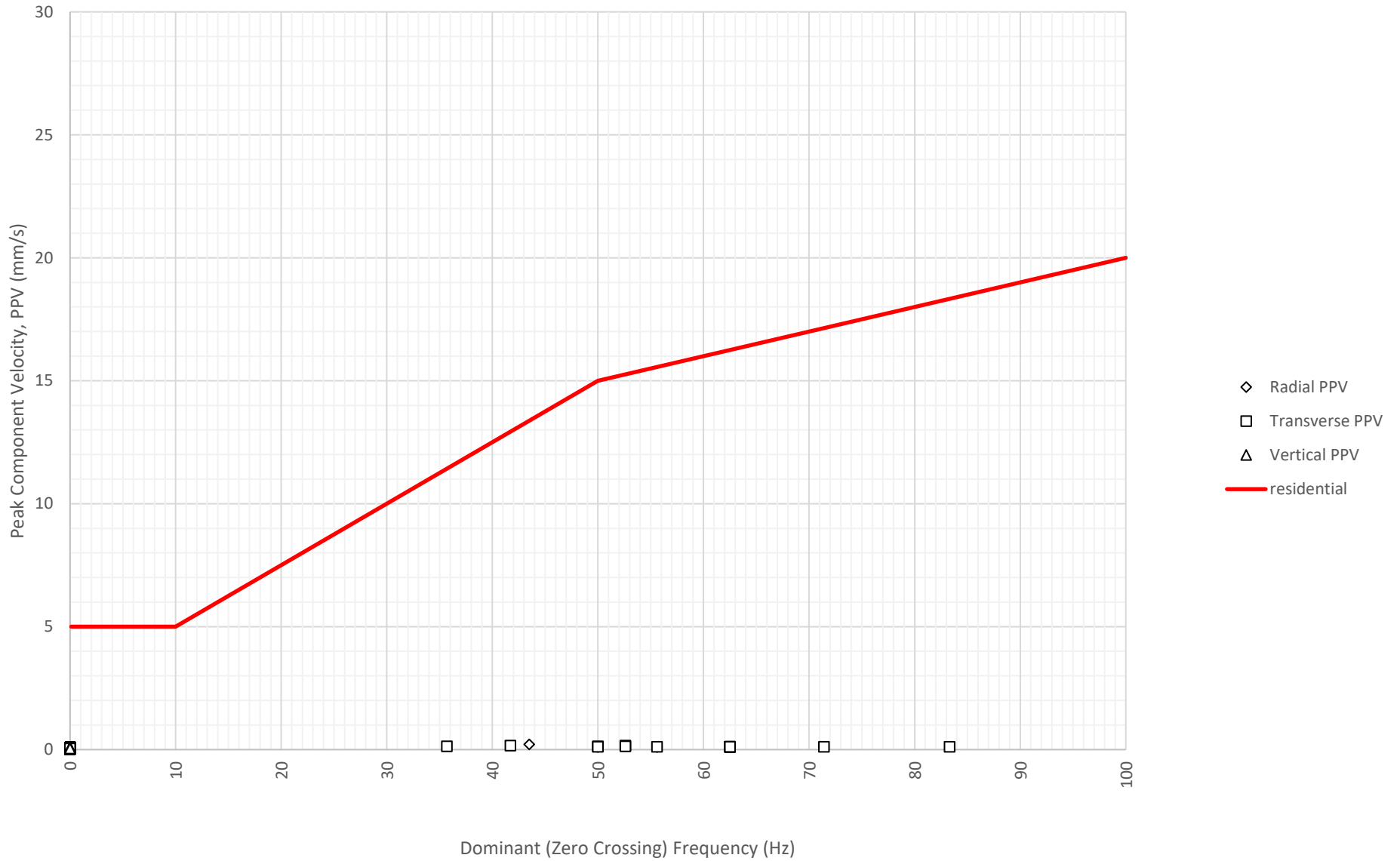
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on
28-07-2022



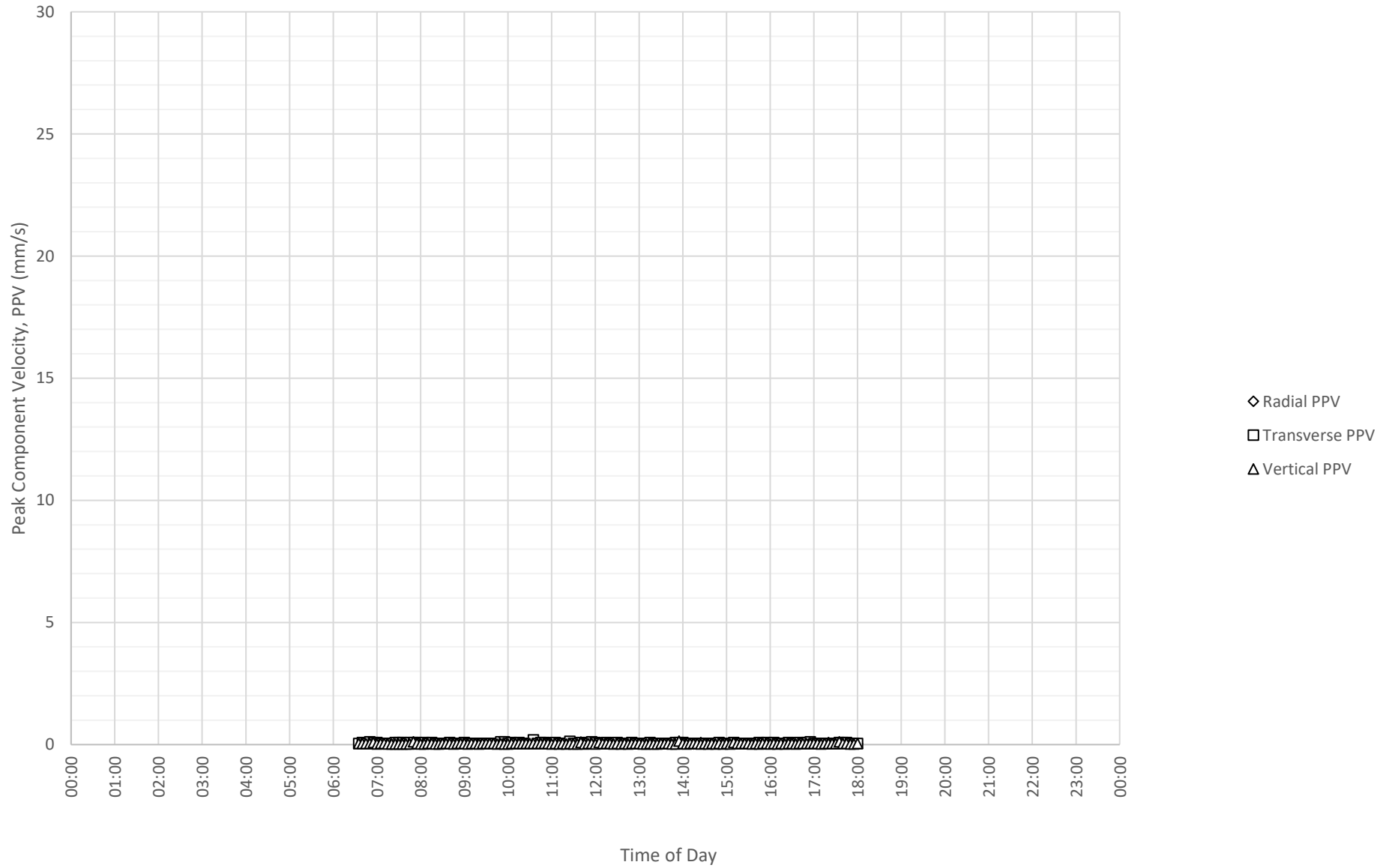
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 29-07-2022



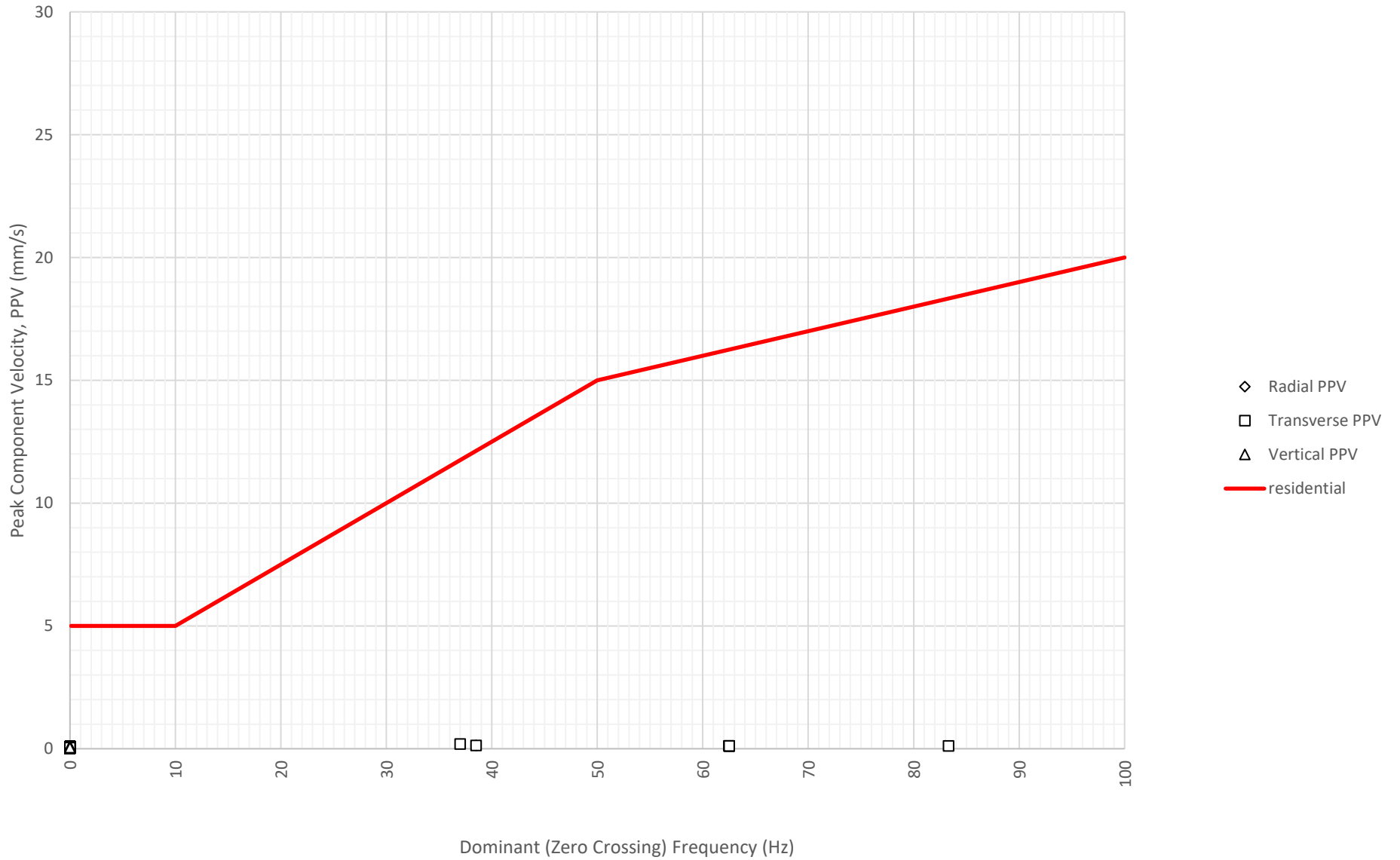
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 29-07-2022



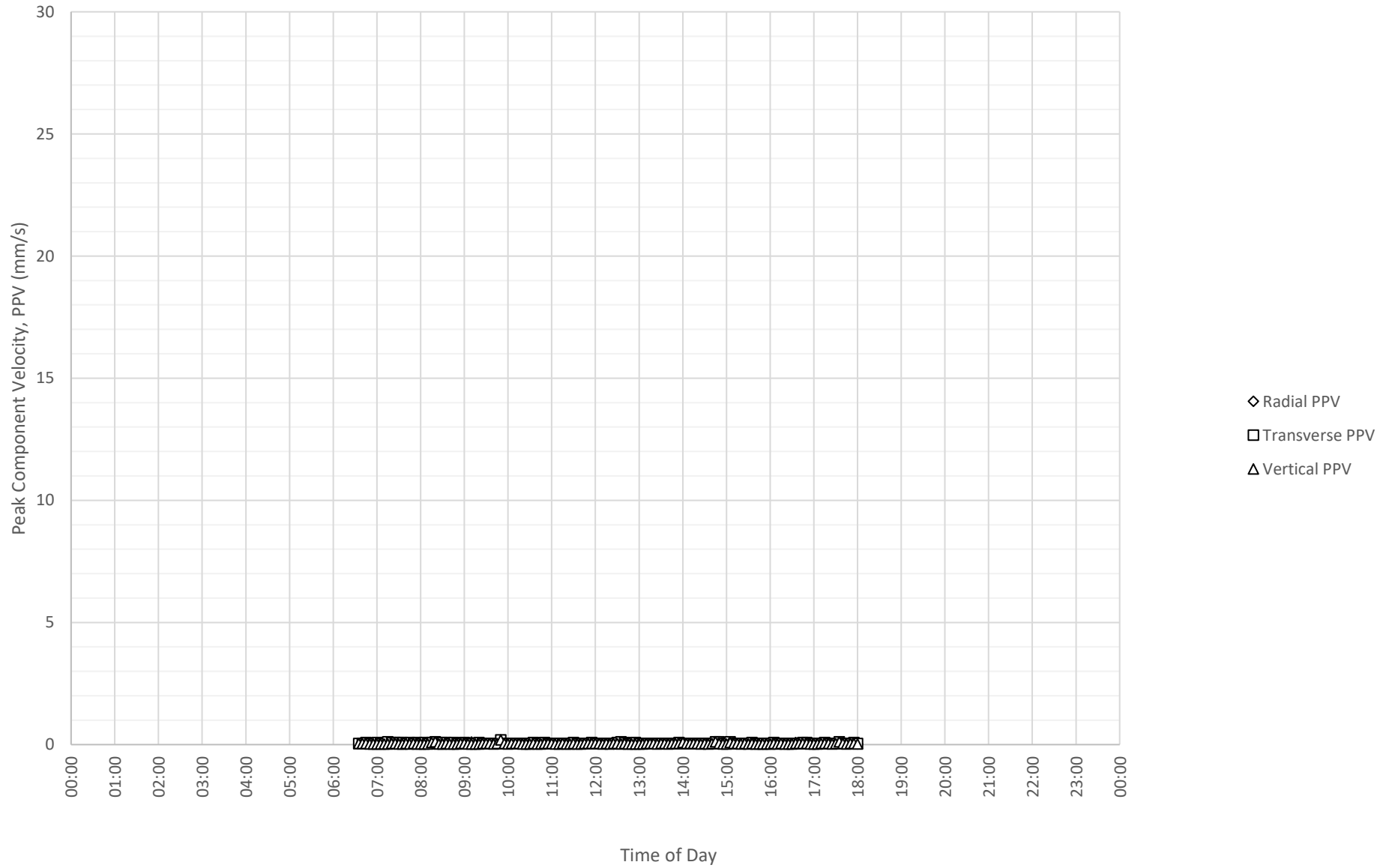
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 30-07-2022



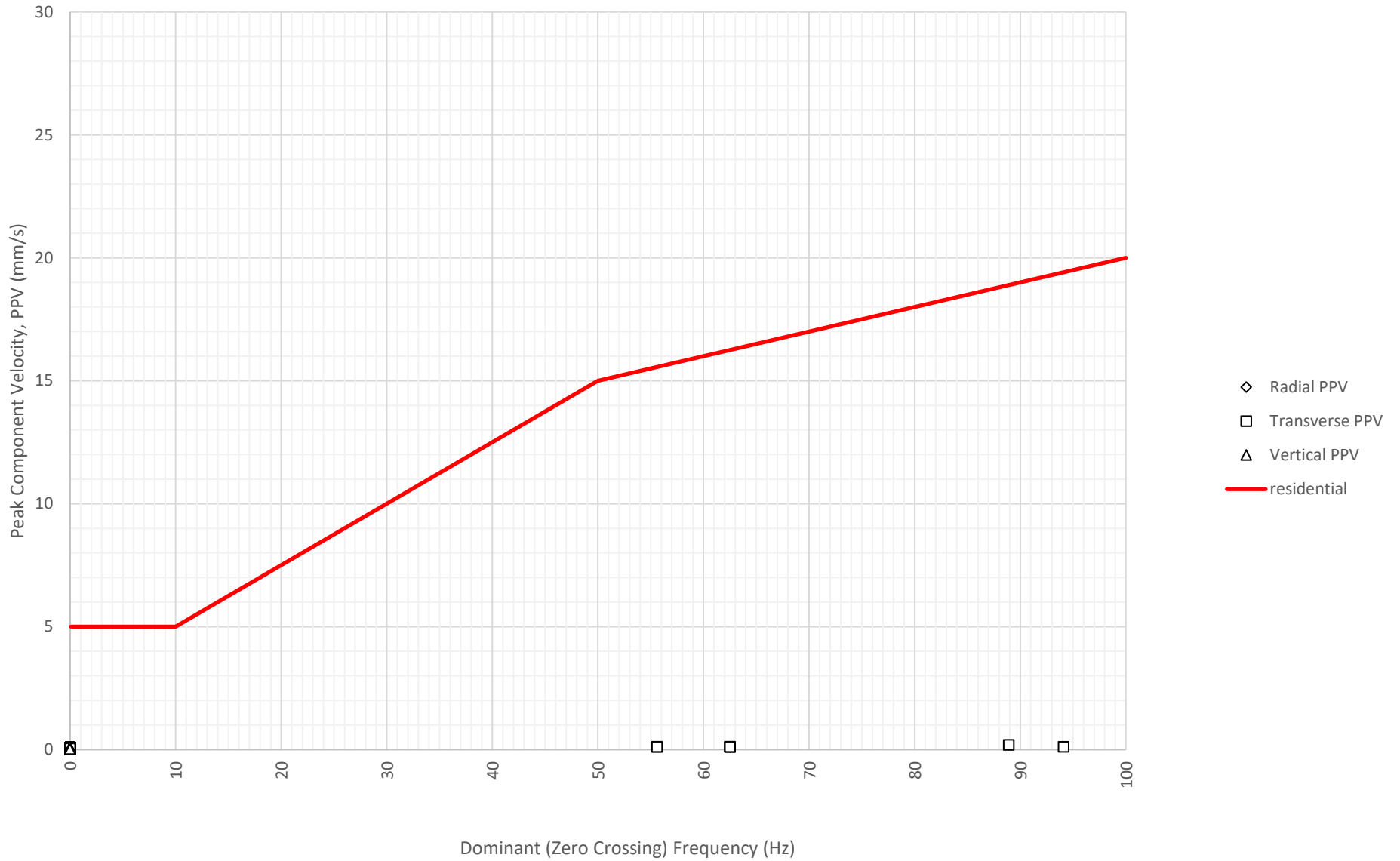
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 30-07-2022



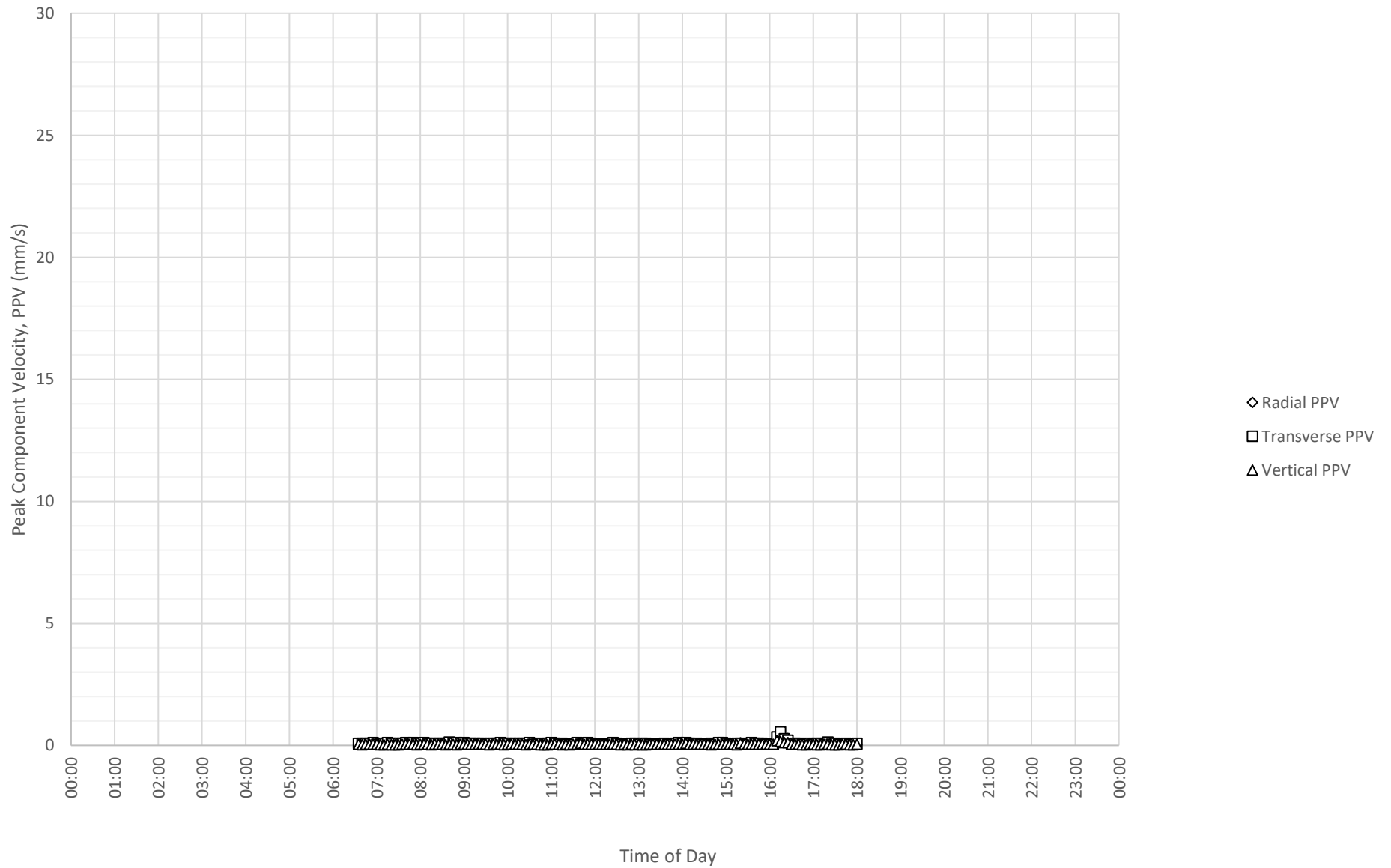
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 31-07-2022



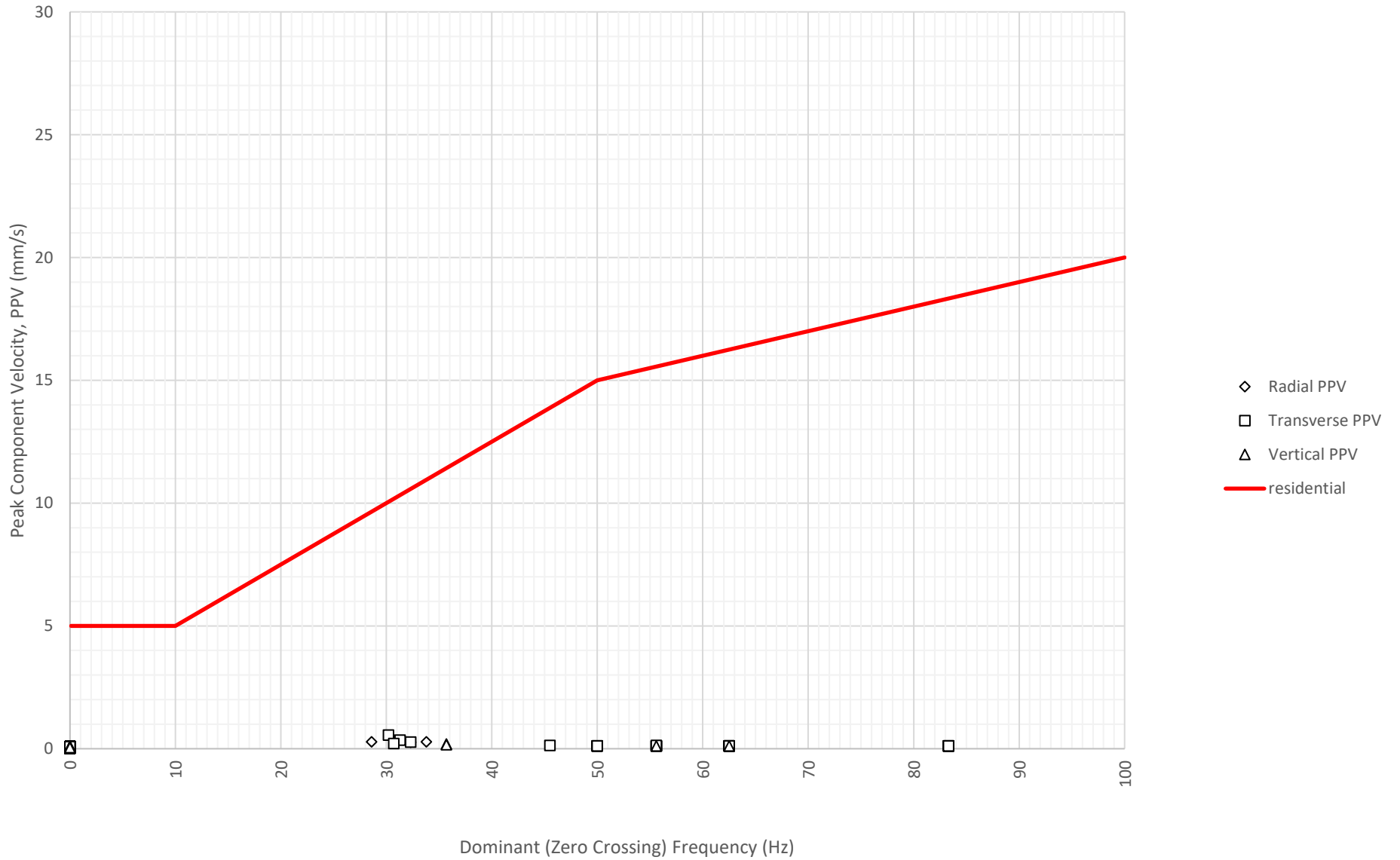
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 31-07-2022



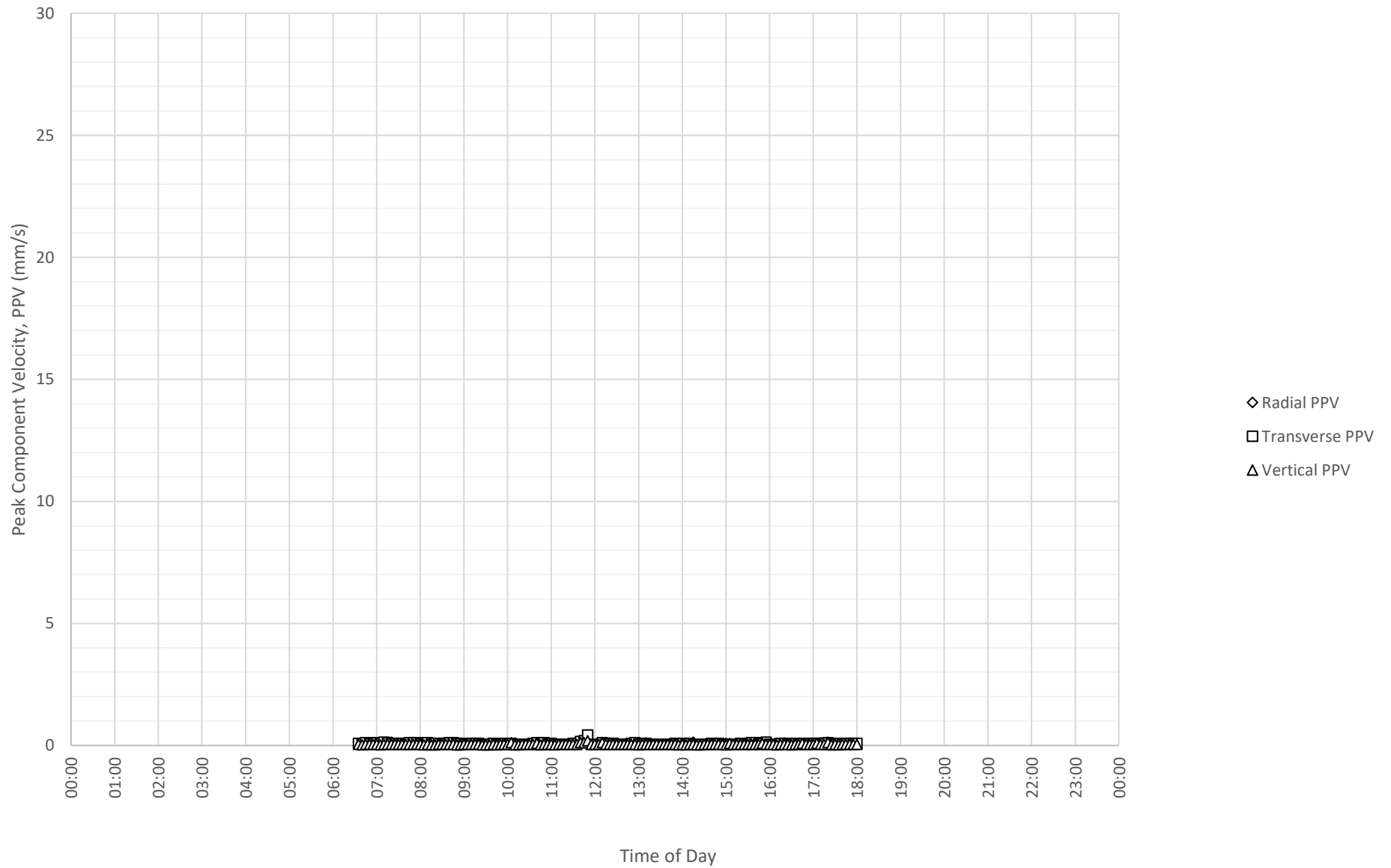
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 1-08-2022



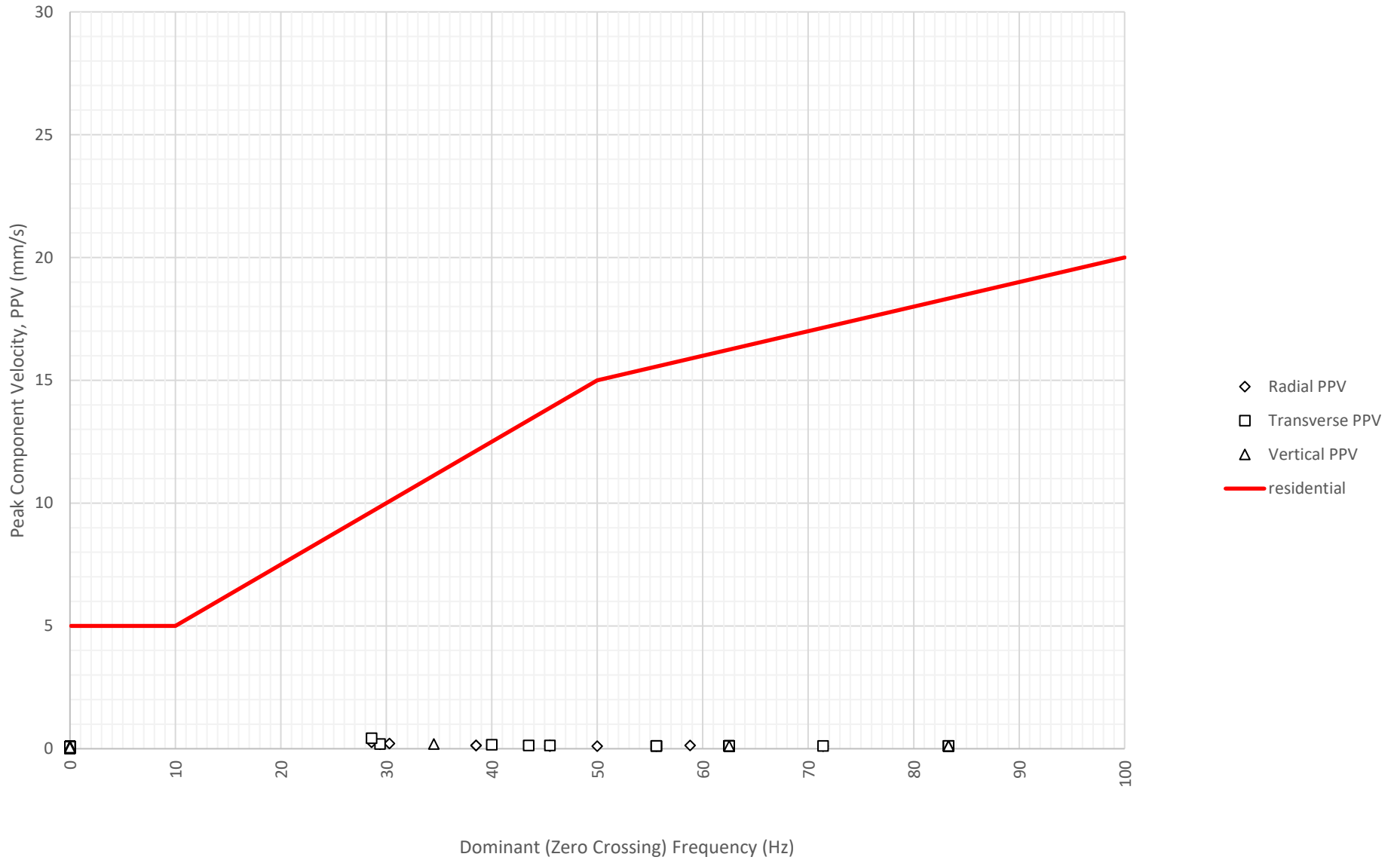
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 1-08-2022



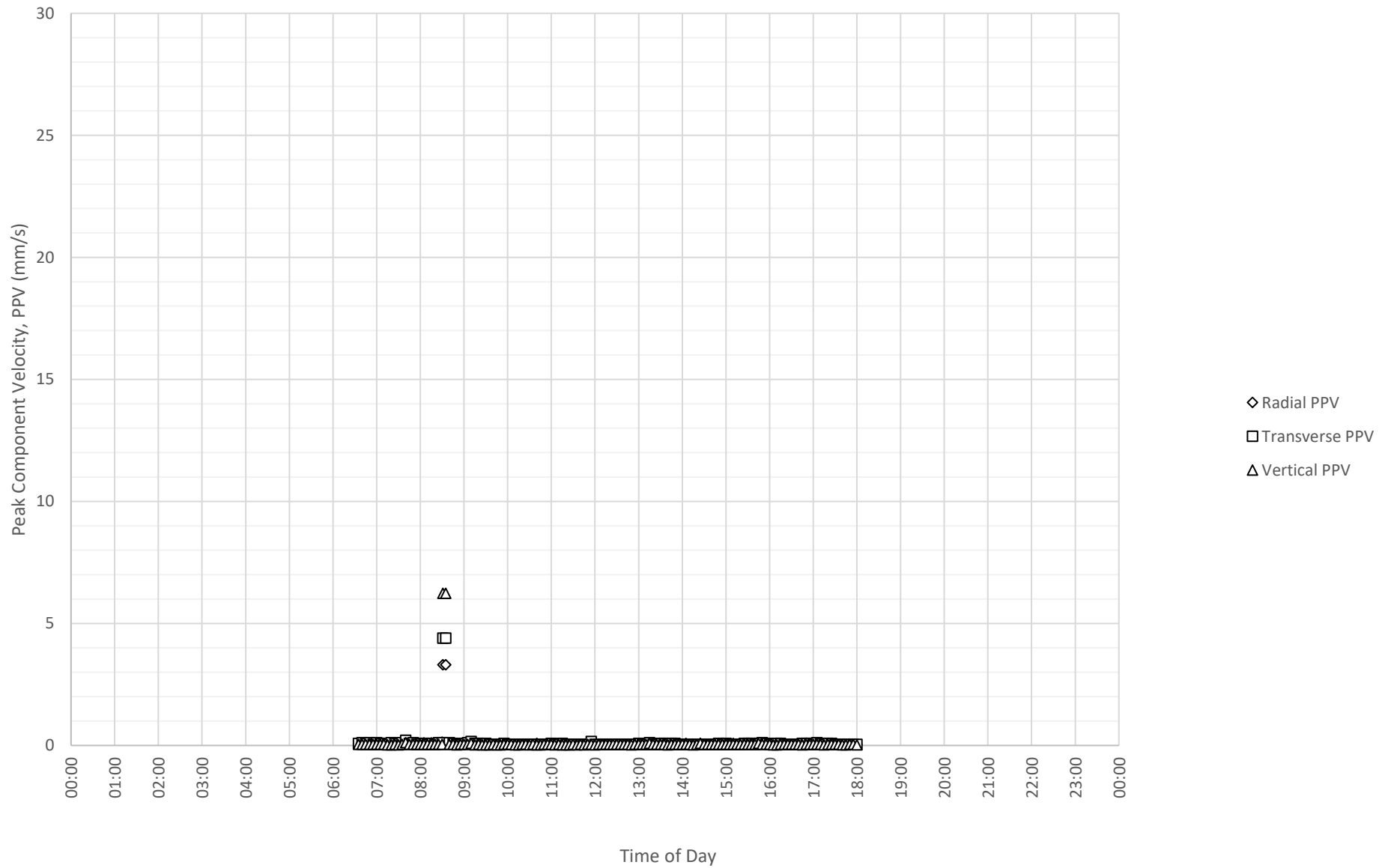
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 2-08-2022



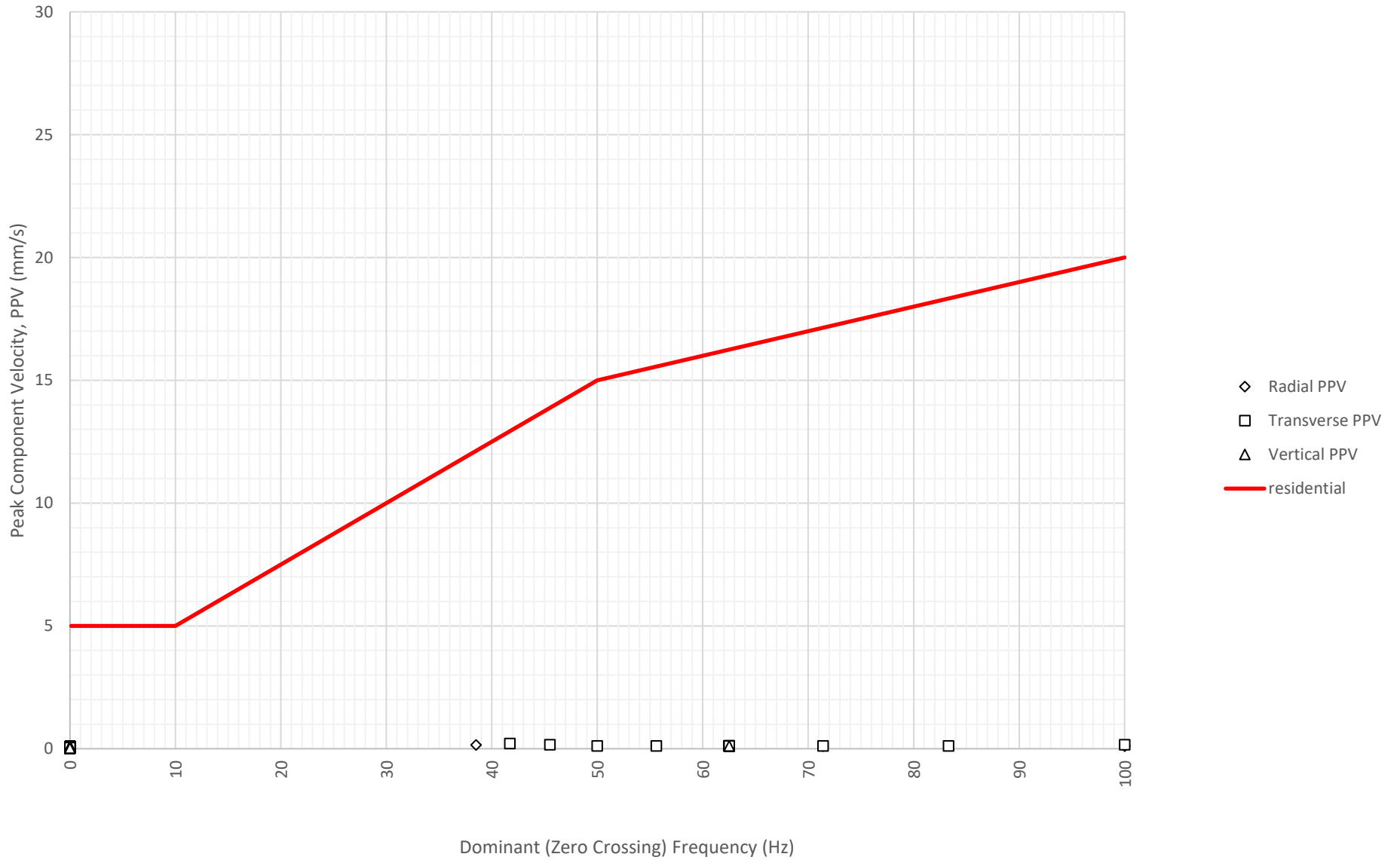
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 2-08-2022



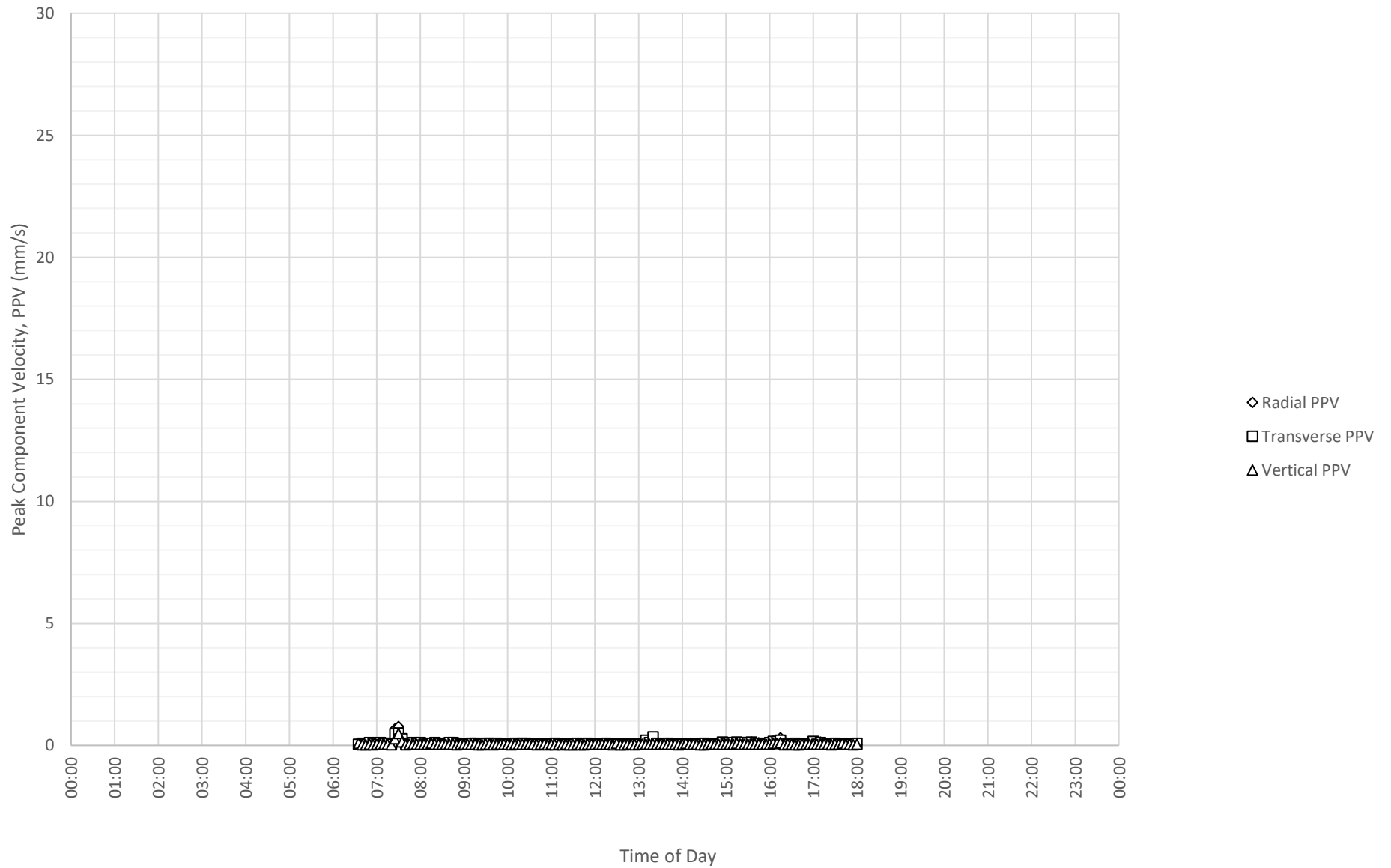
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 3-08-2022



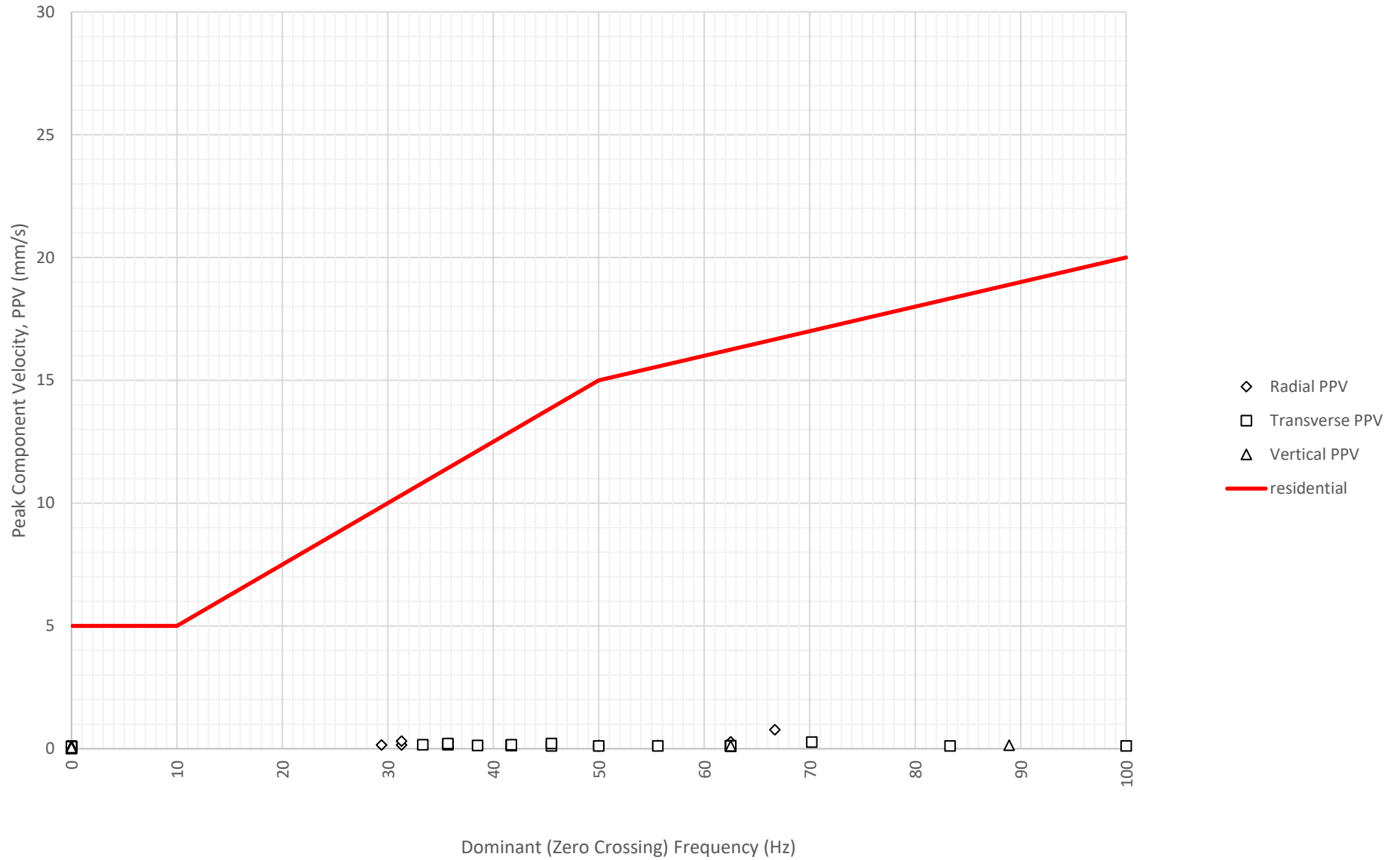
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 3-08-2022



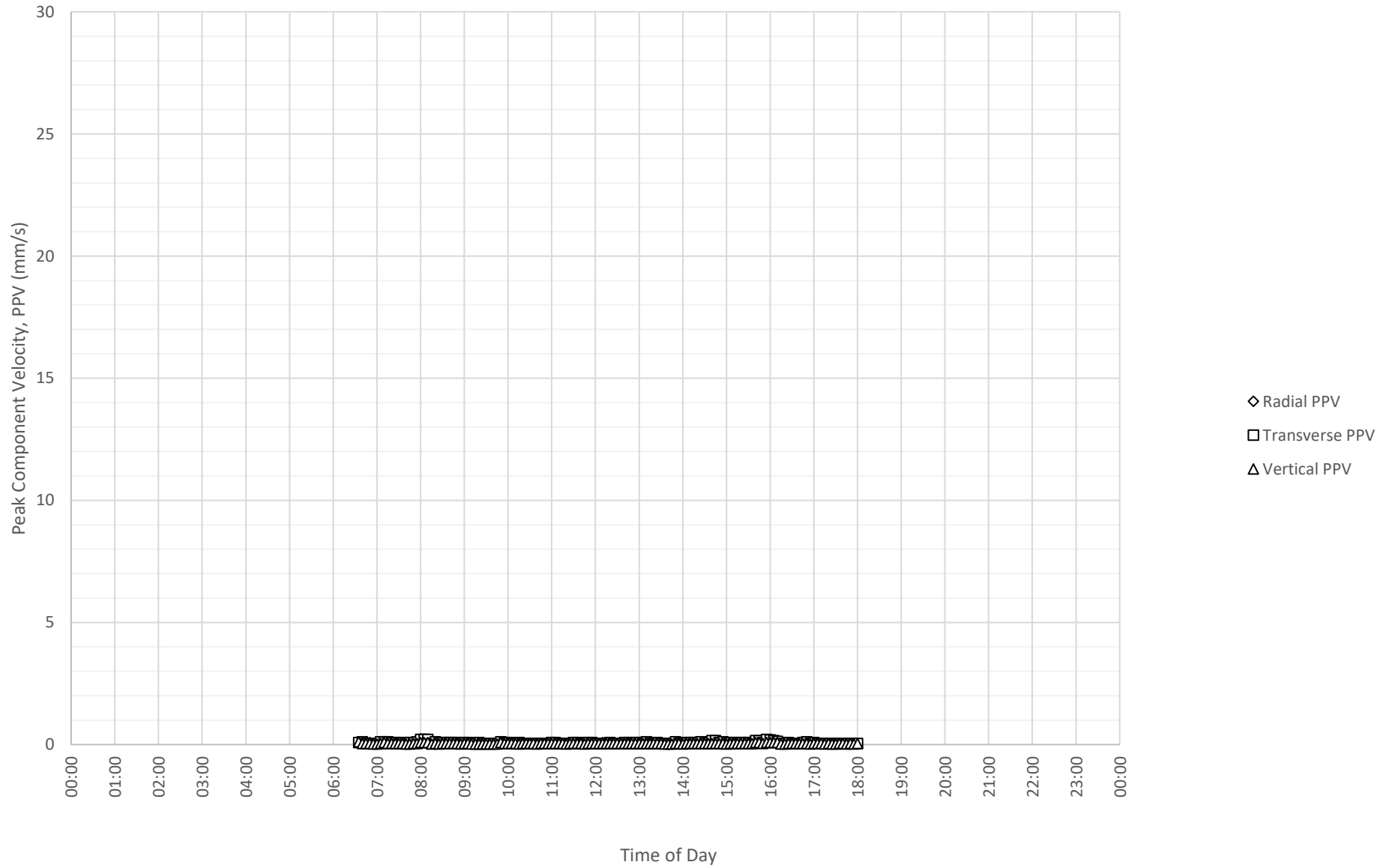
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 4-08-2022



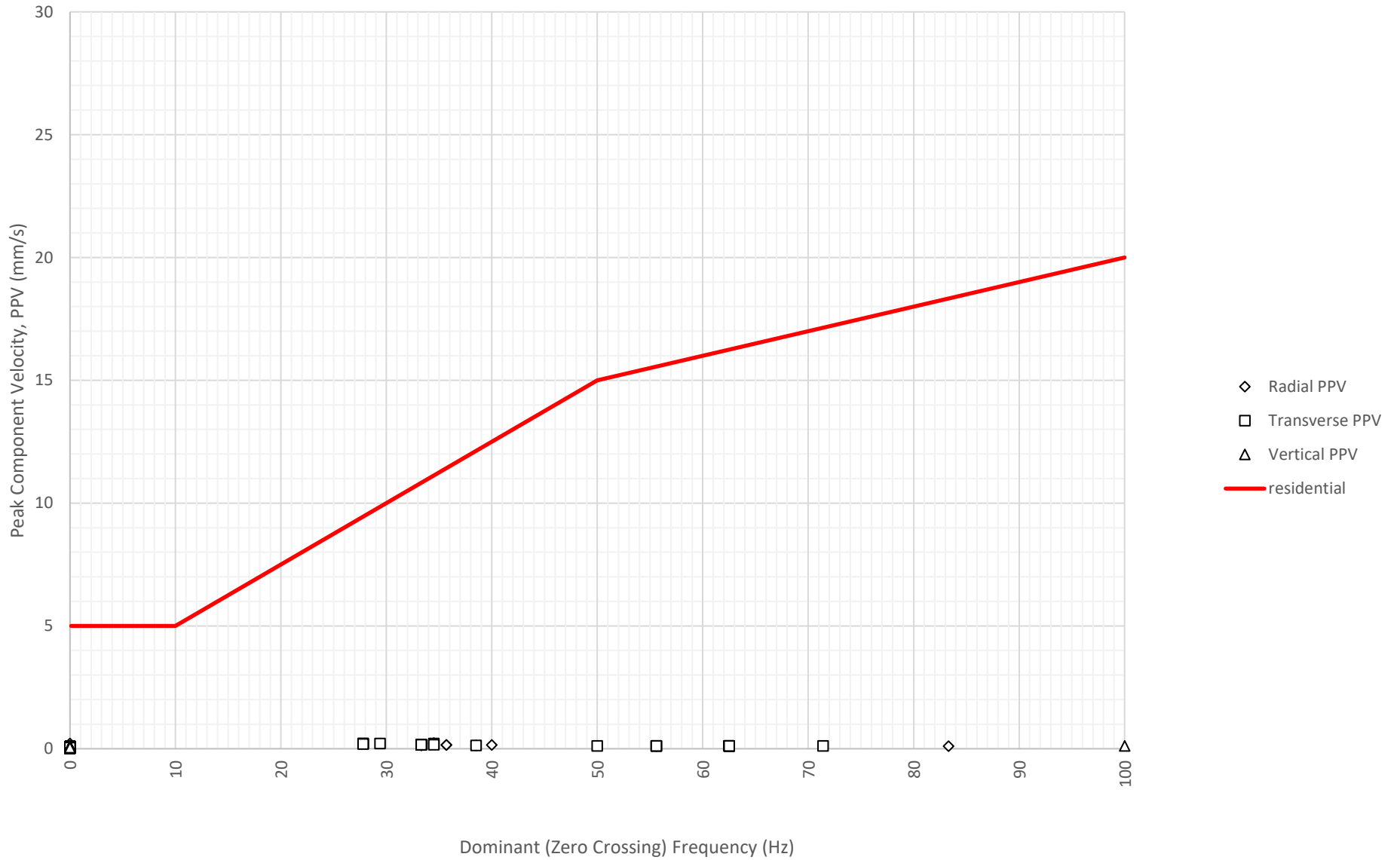
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 4-08-2022



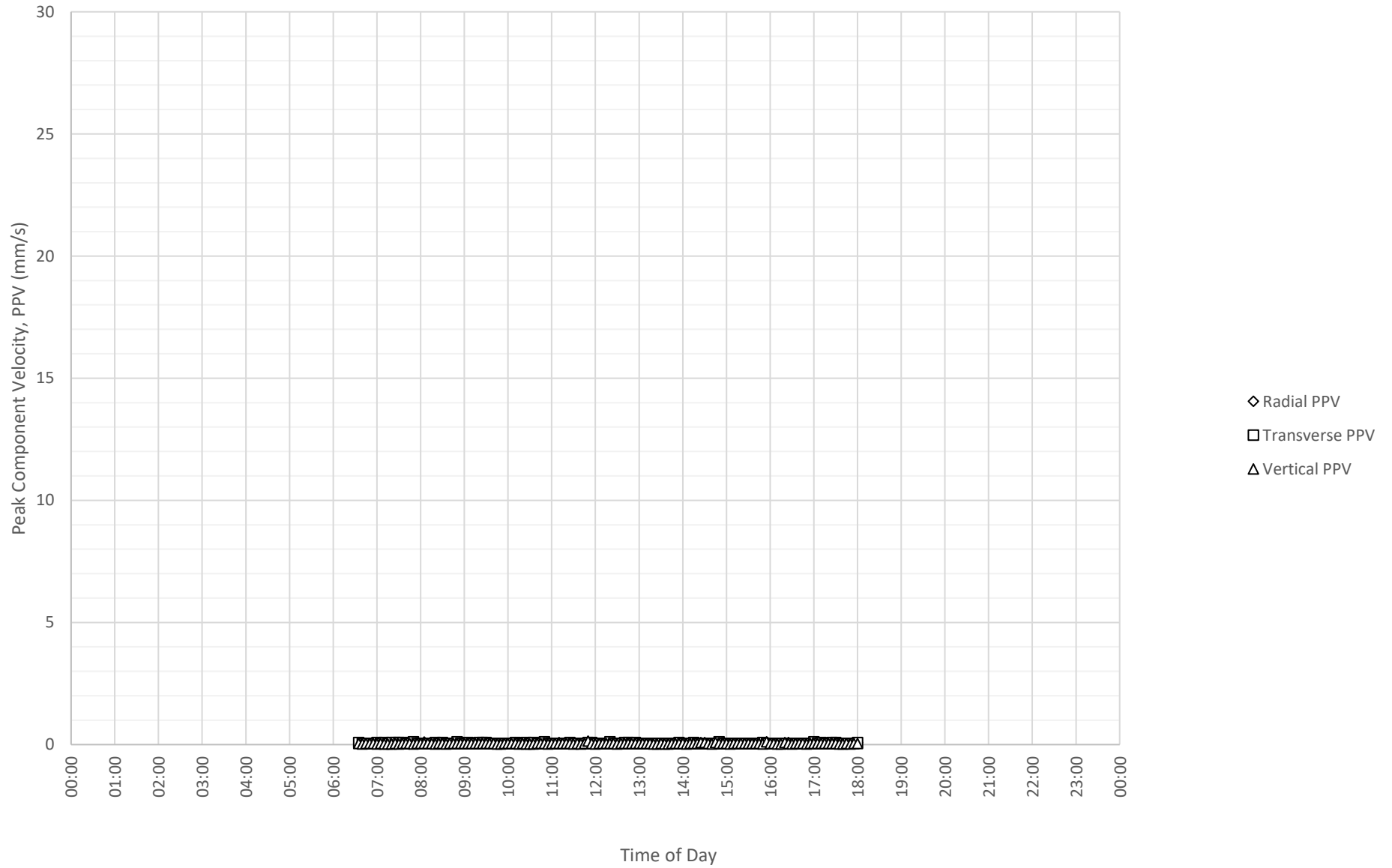
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 5-08-2022



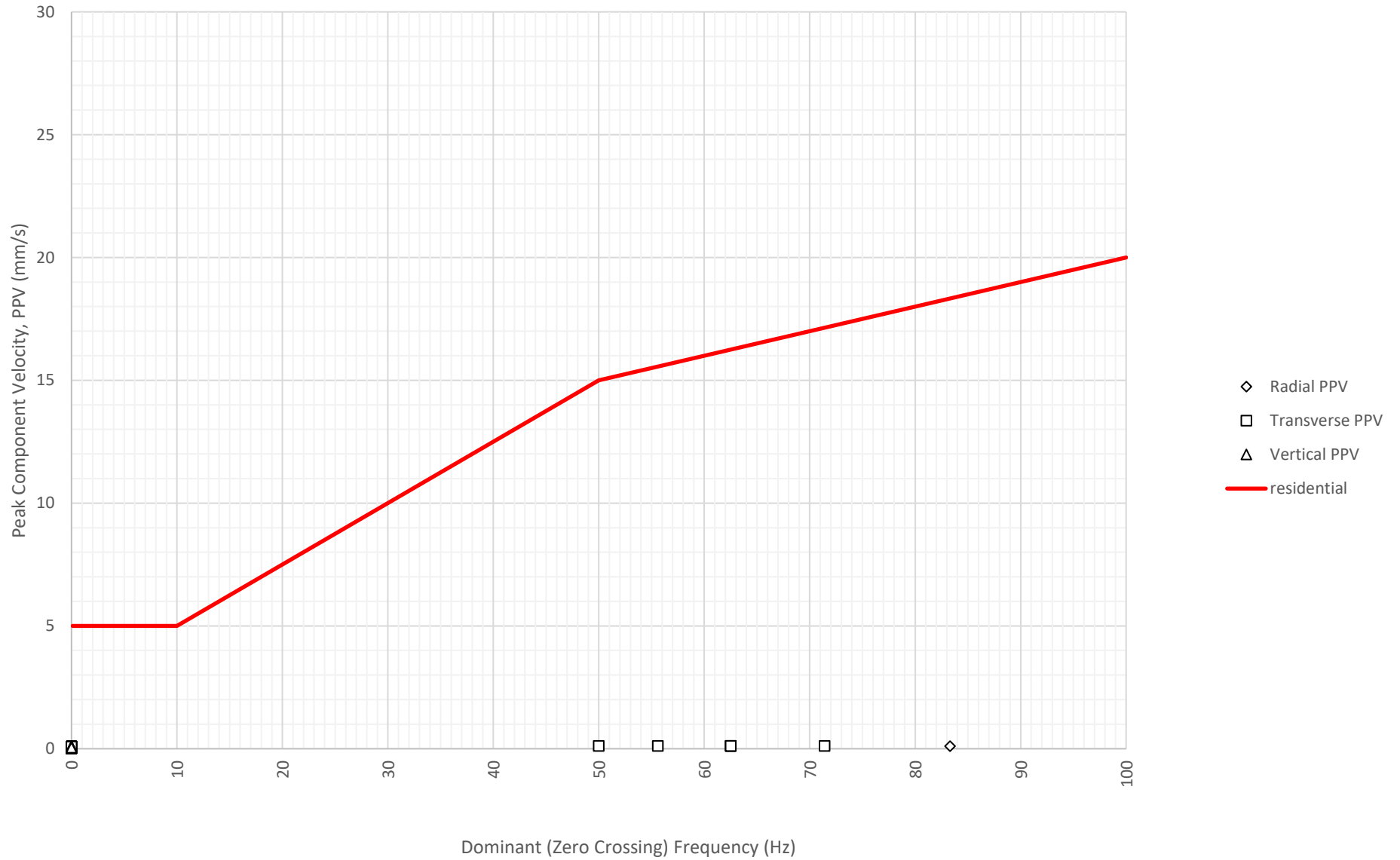
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 5-08-2022



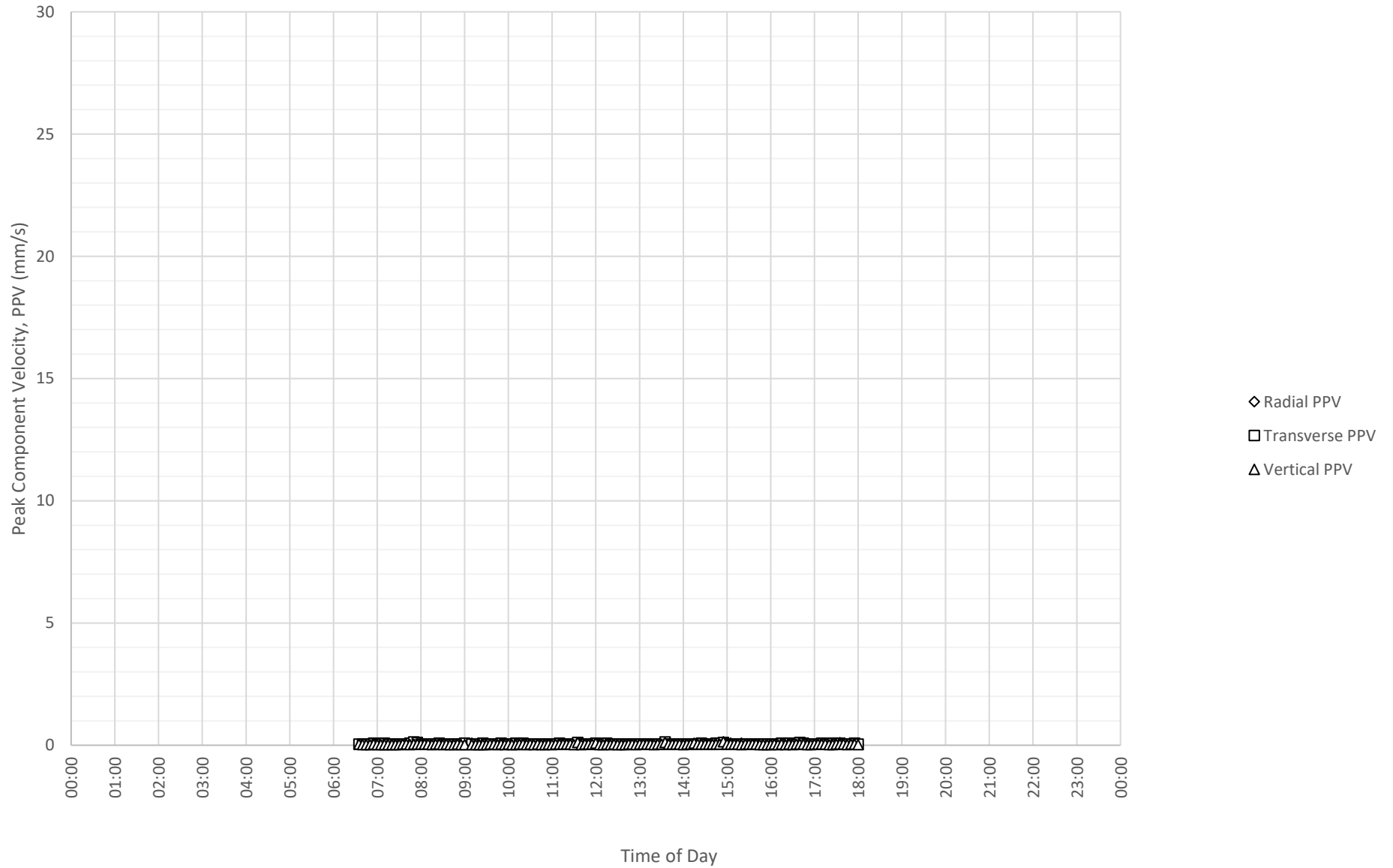
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 6-08-2022



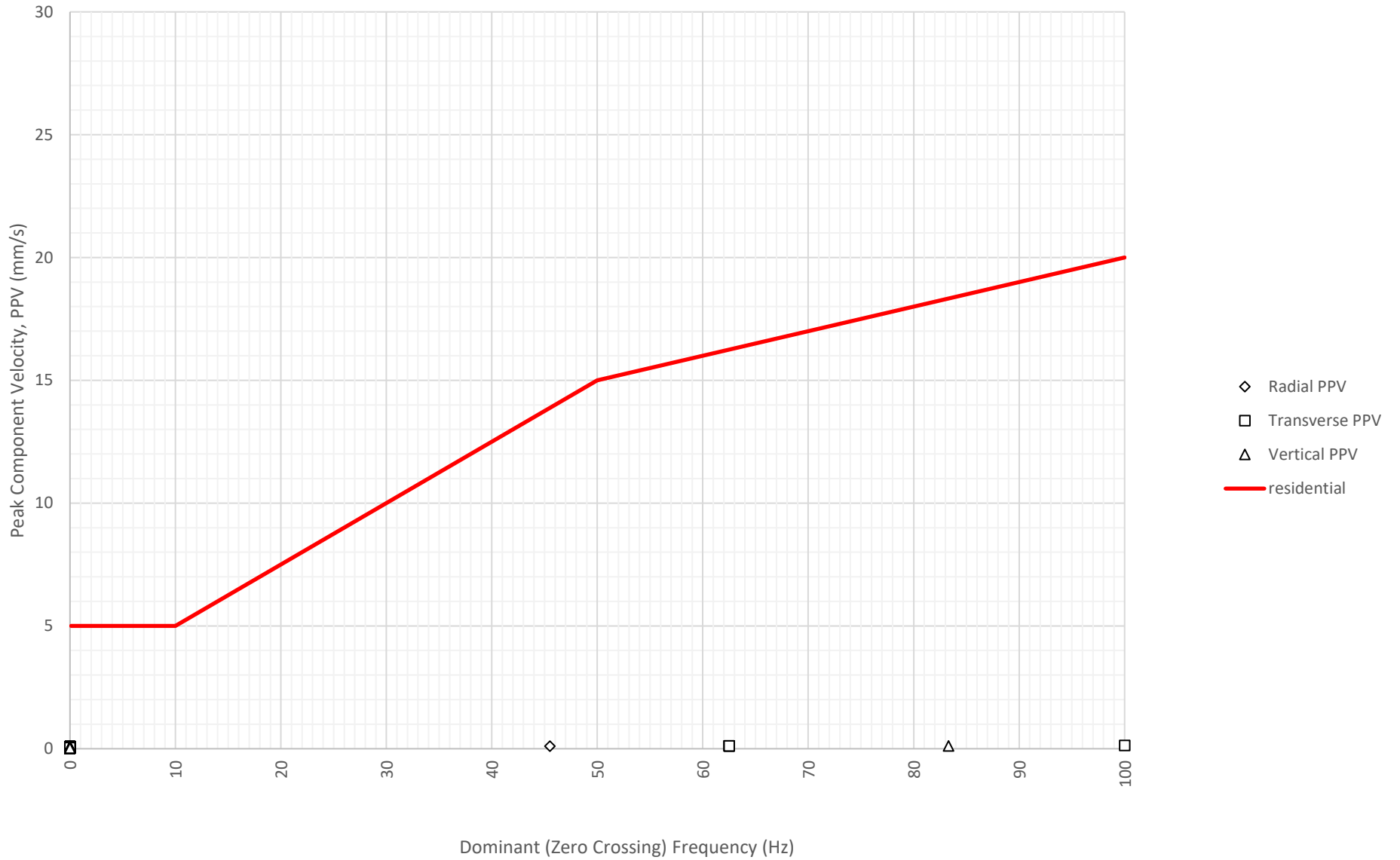
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 6-08-2022



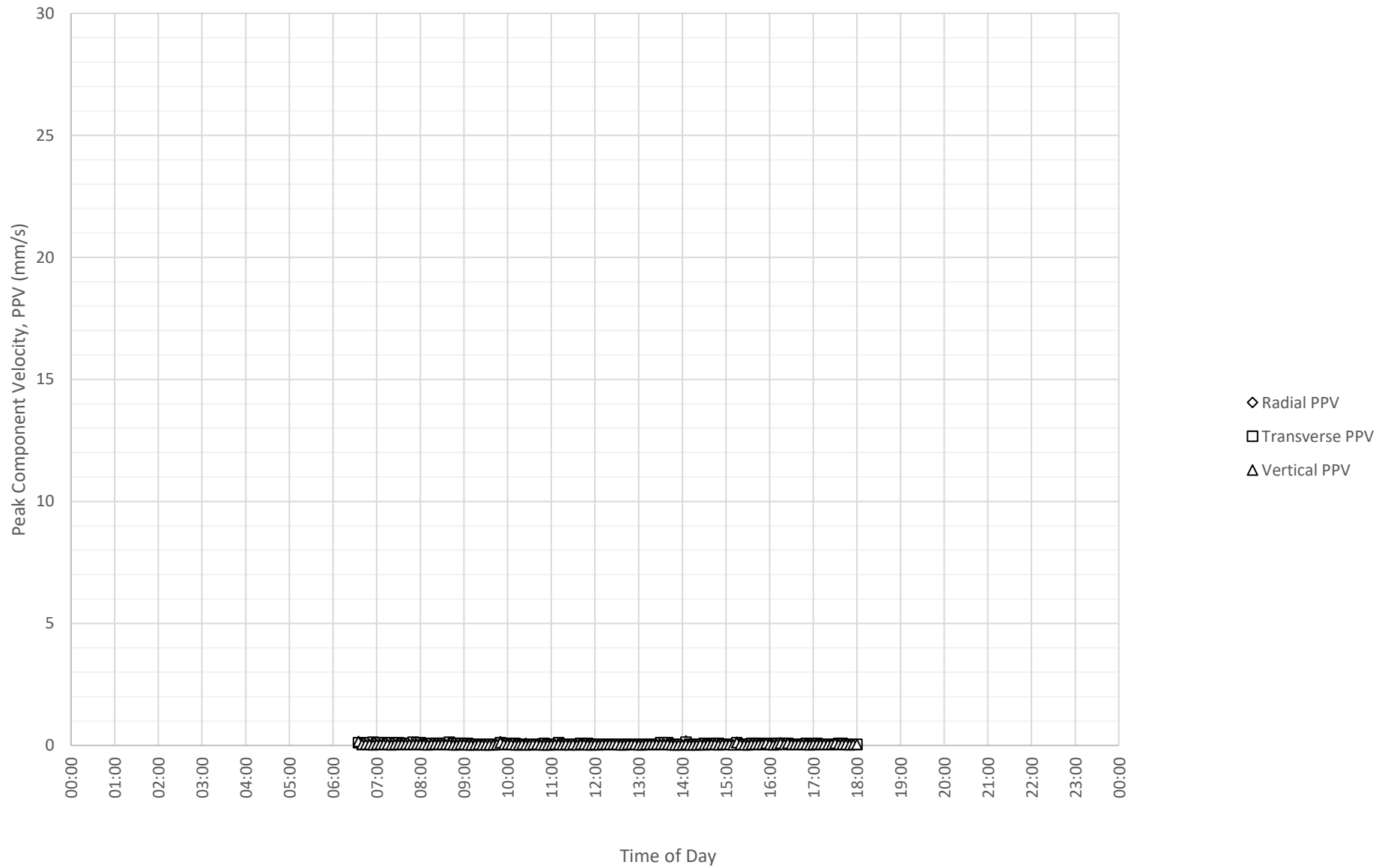
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 7-08-2022



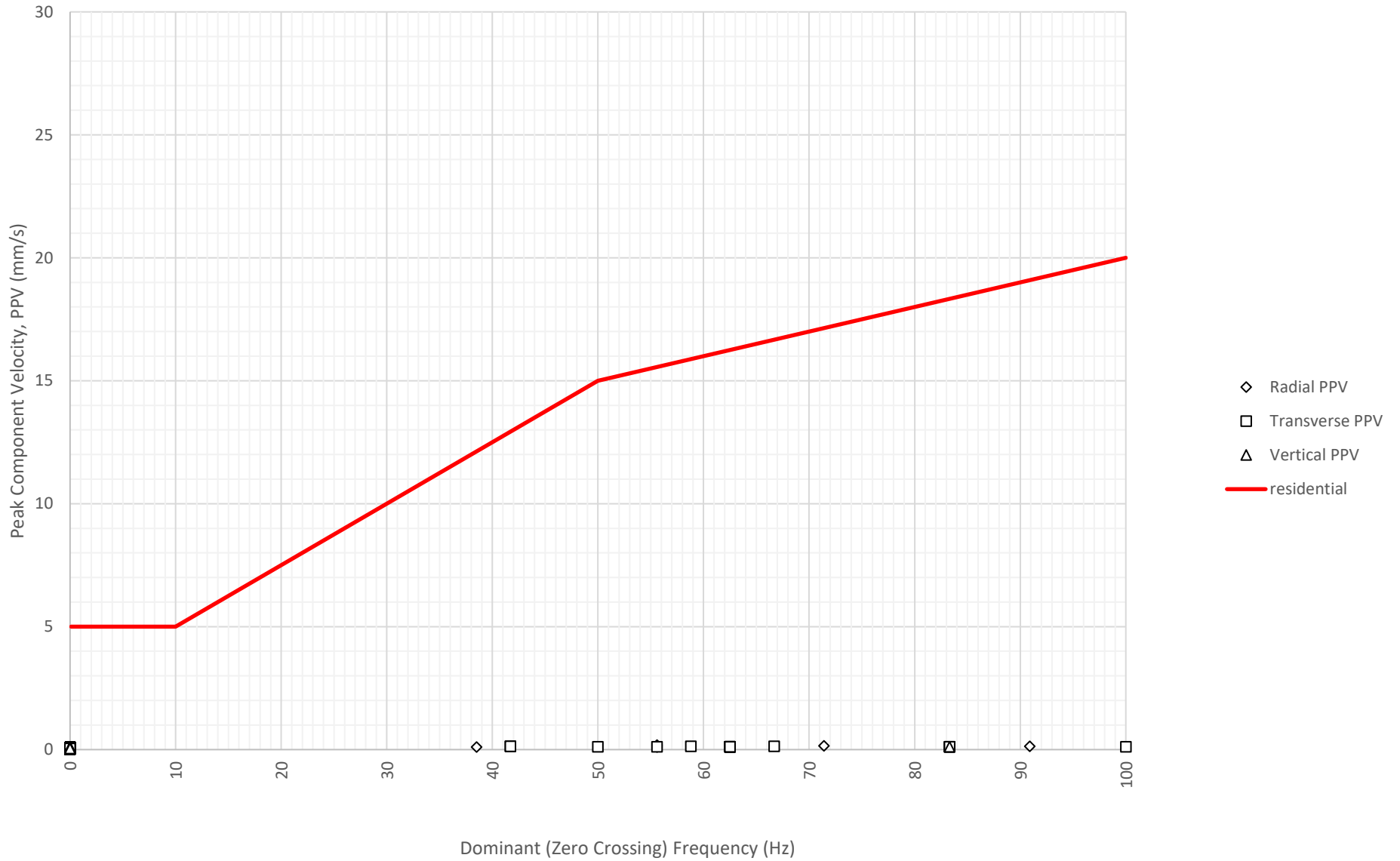
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on
7-08-2022



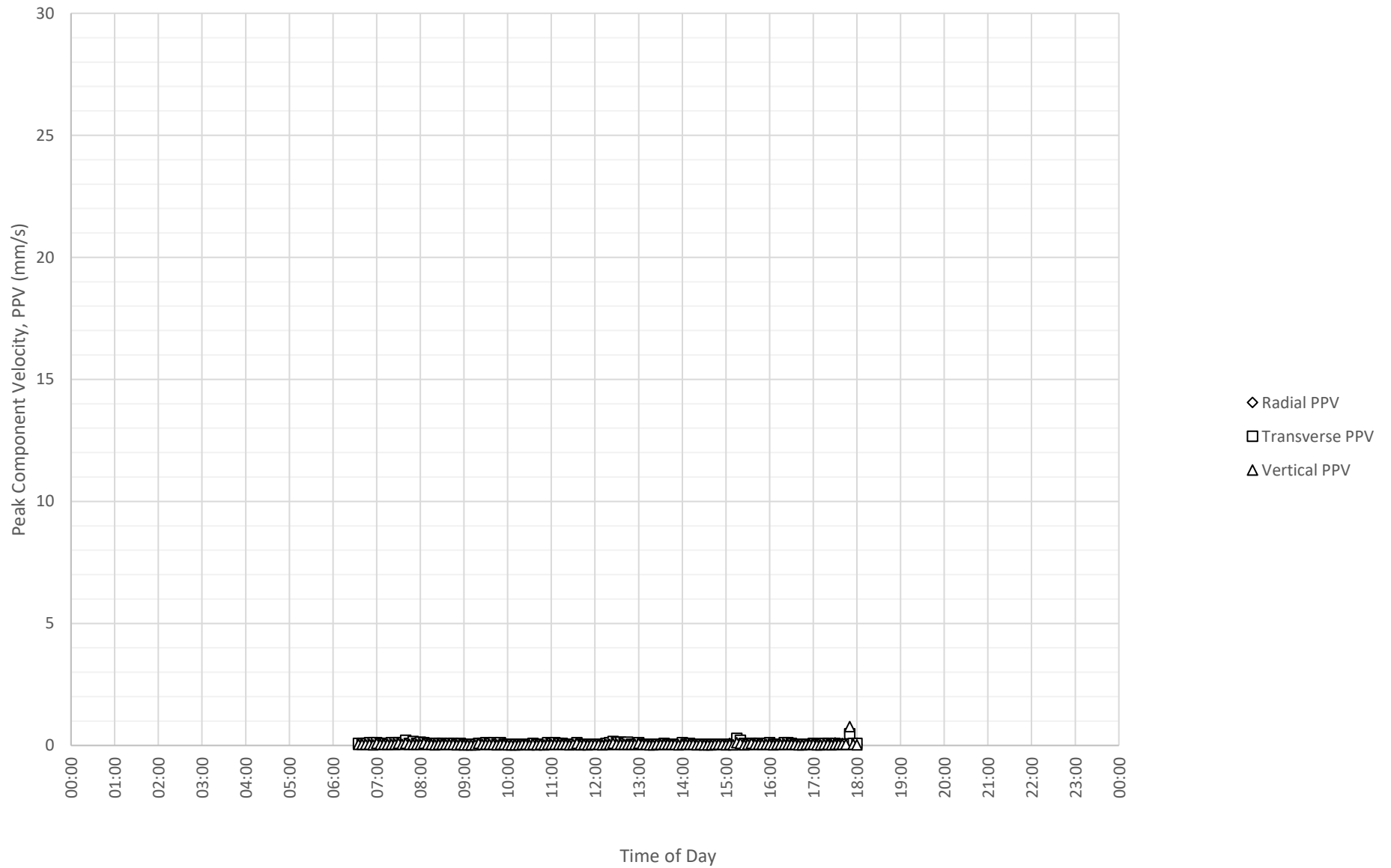
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 8-08-2022



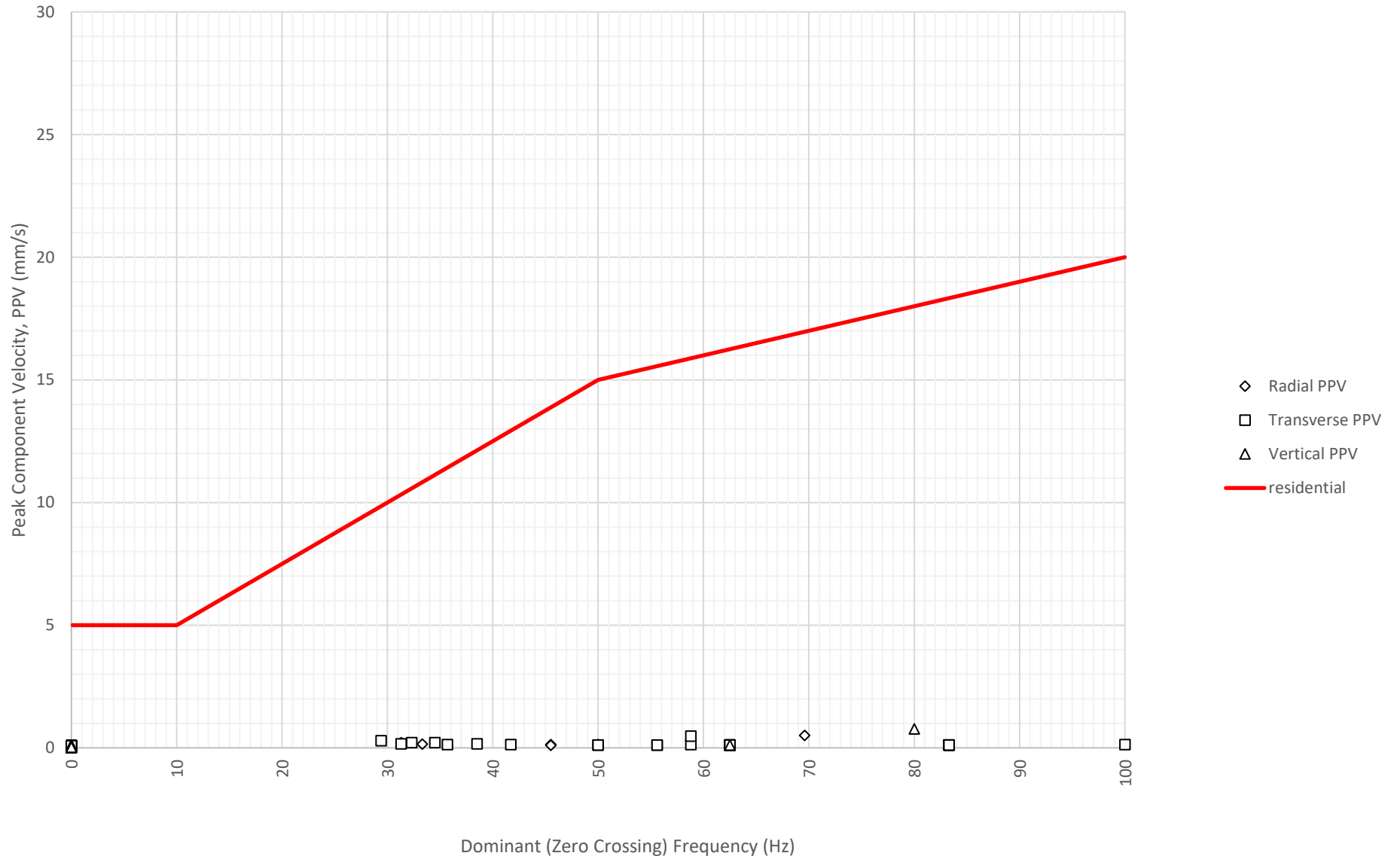
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 8-08-2022



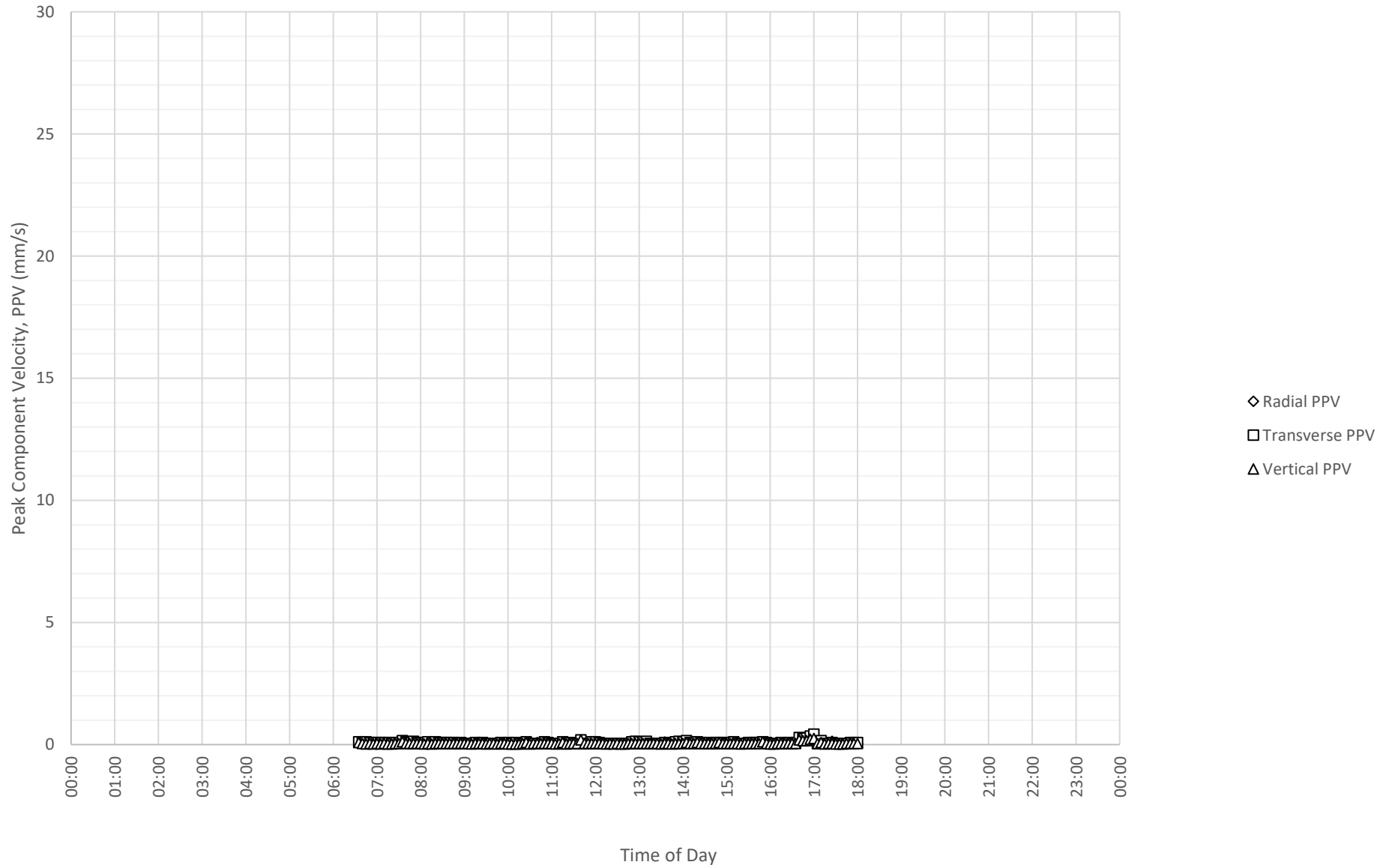
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 9-08-2022



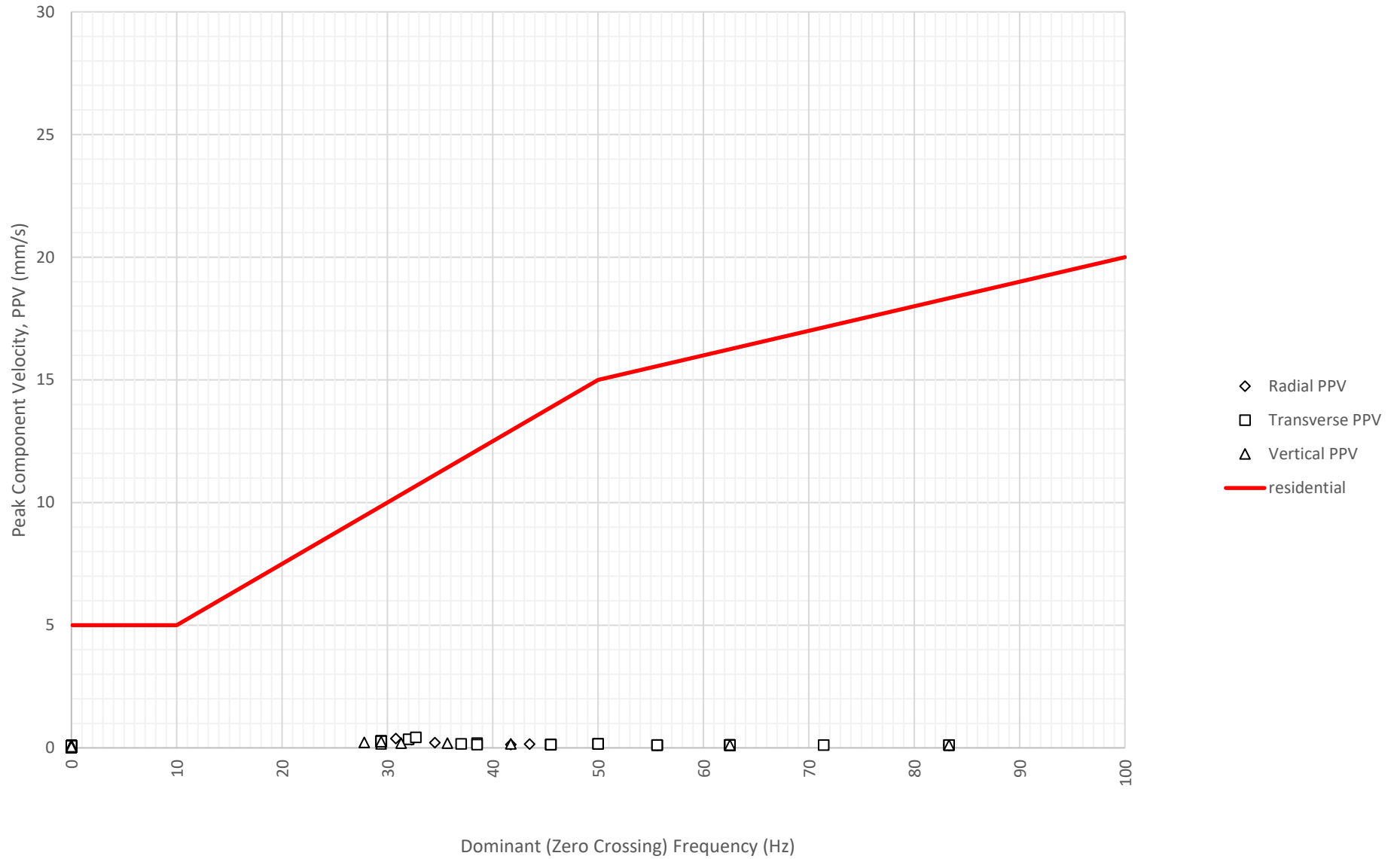
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 9-08-2022



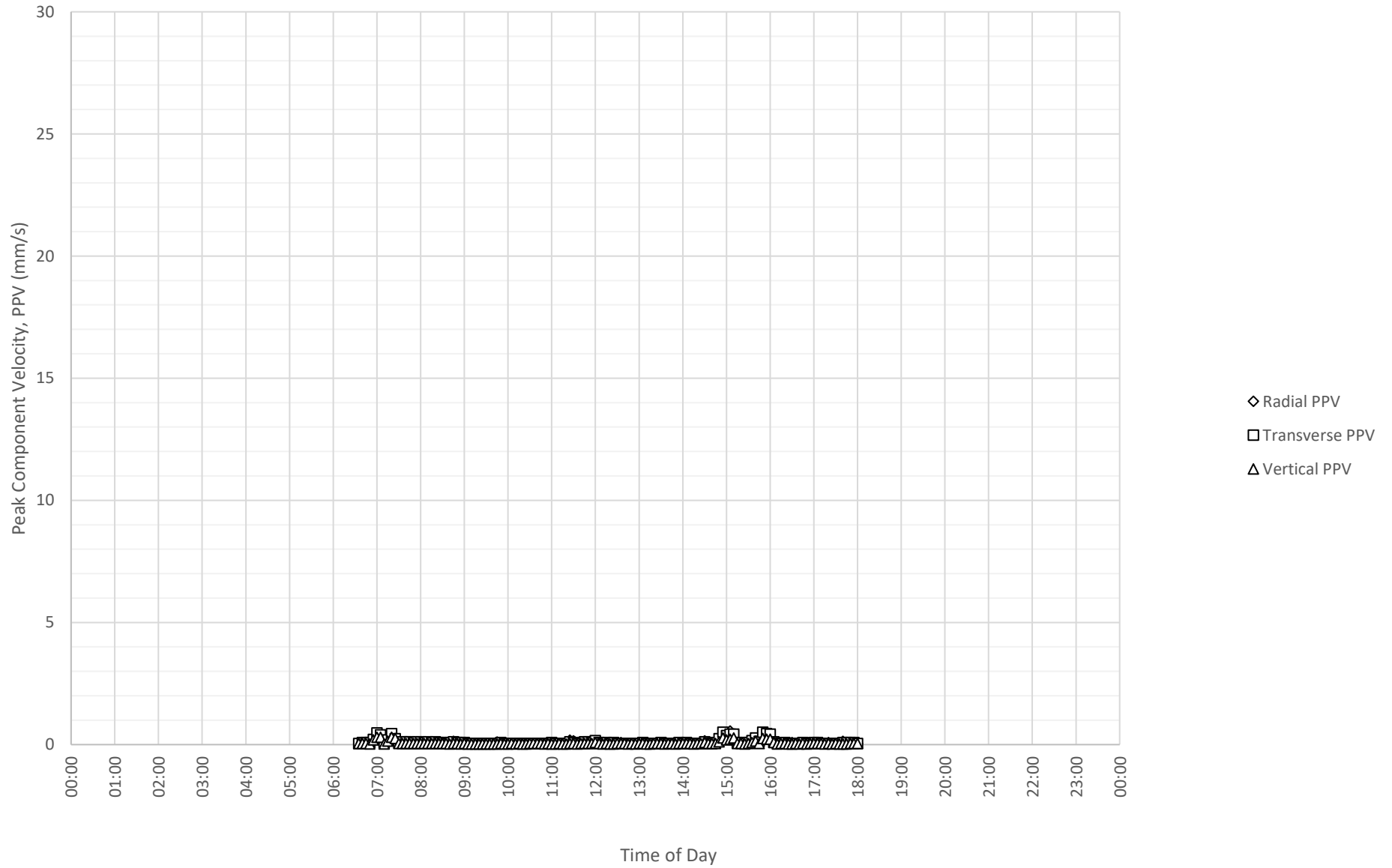
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 10-08-2022



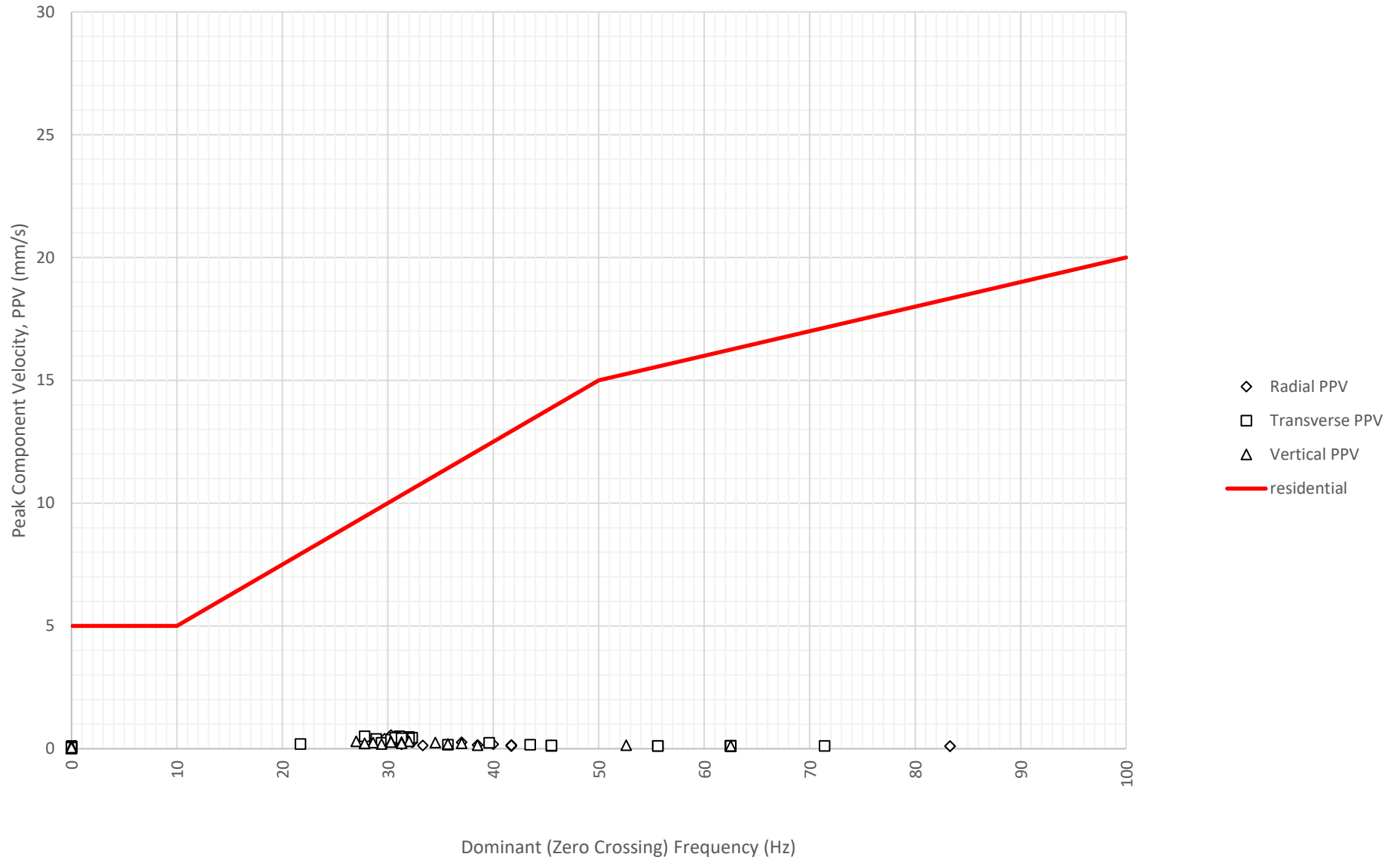
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 10-08-2022



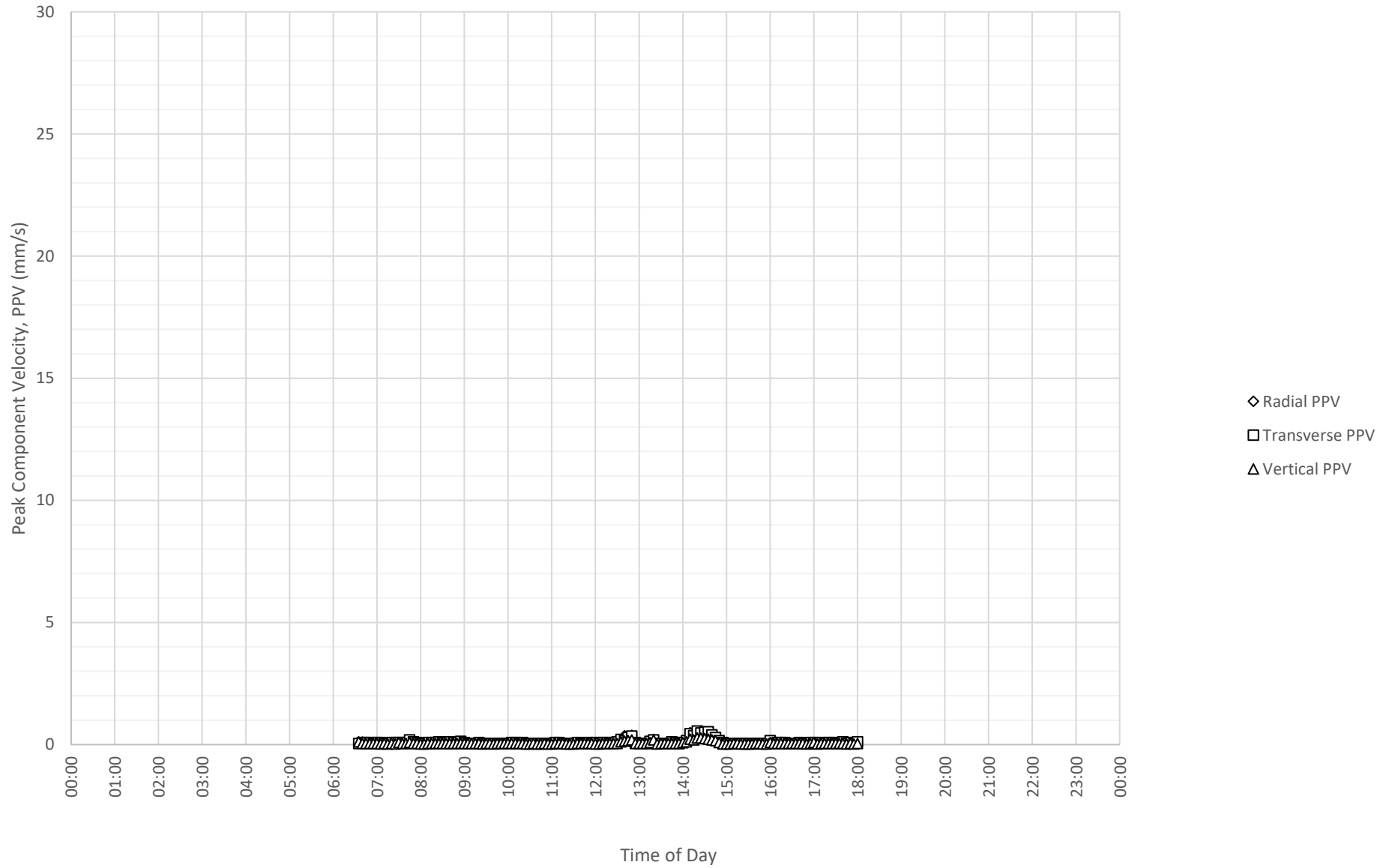
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 11-08-2022



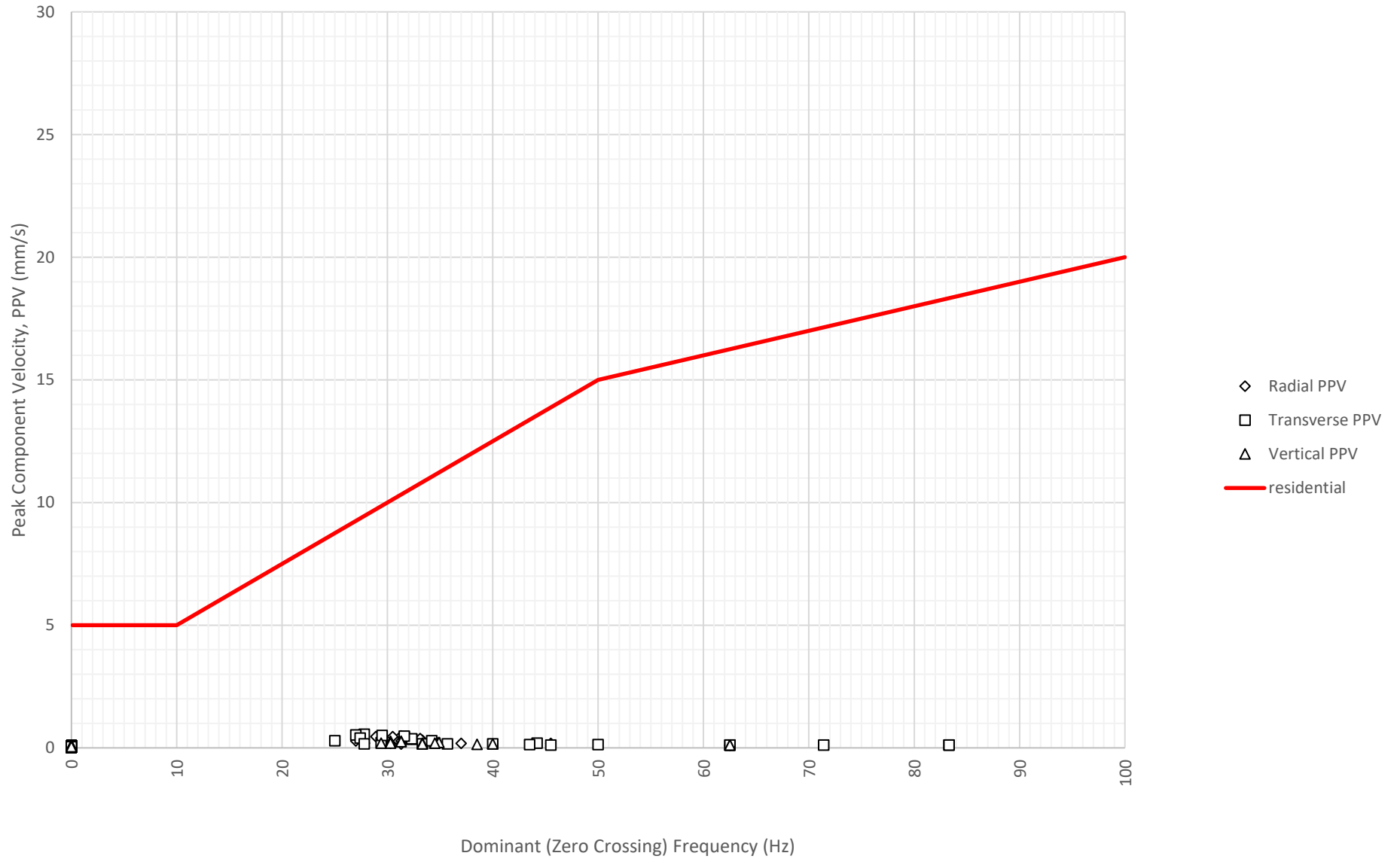
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 11-08-2022



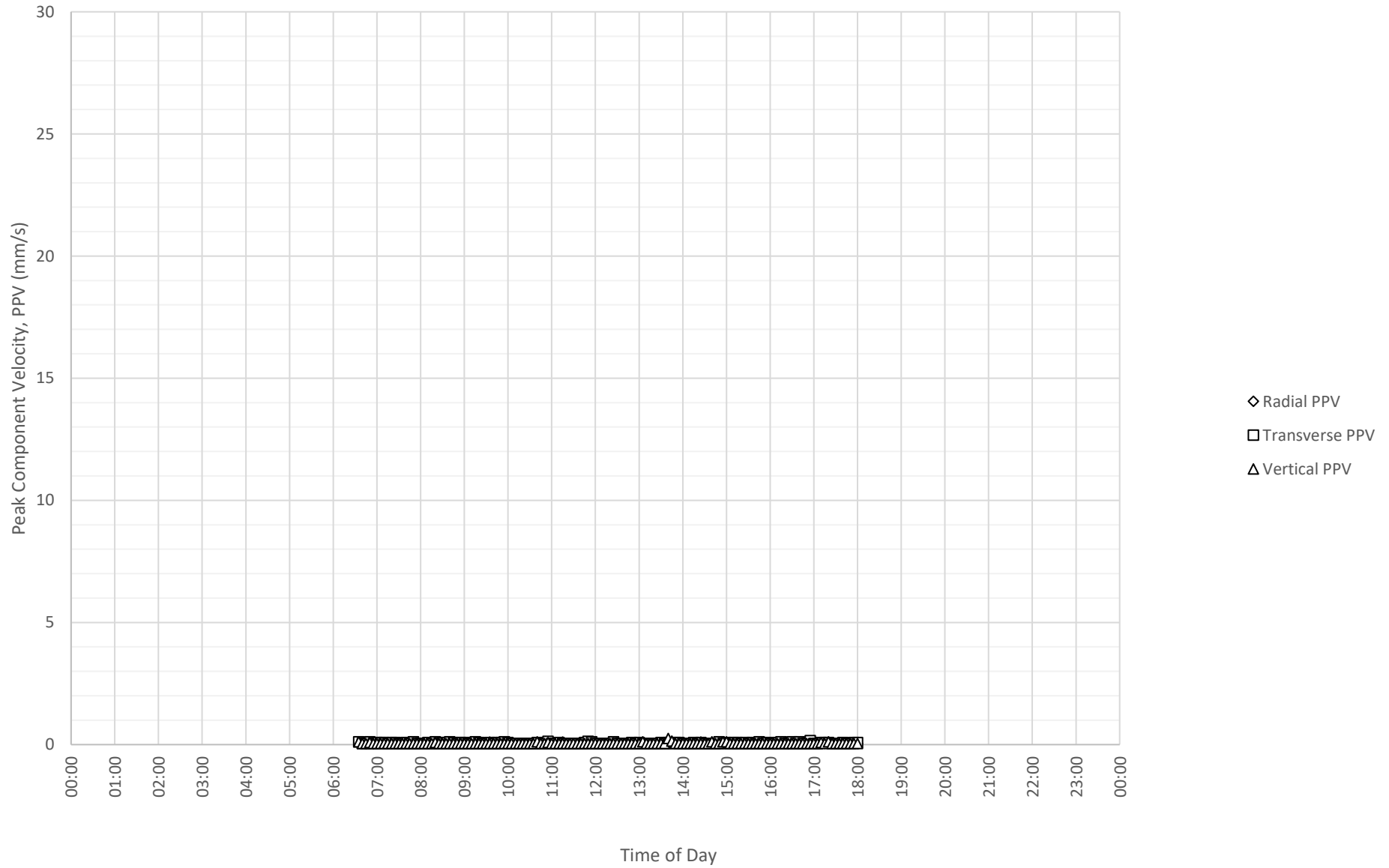
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 12-08-2022



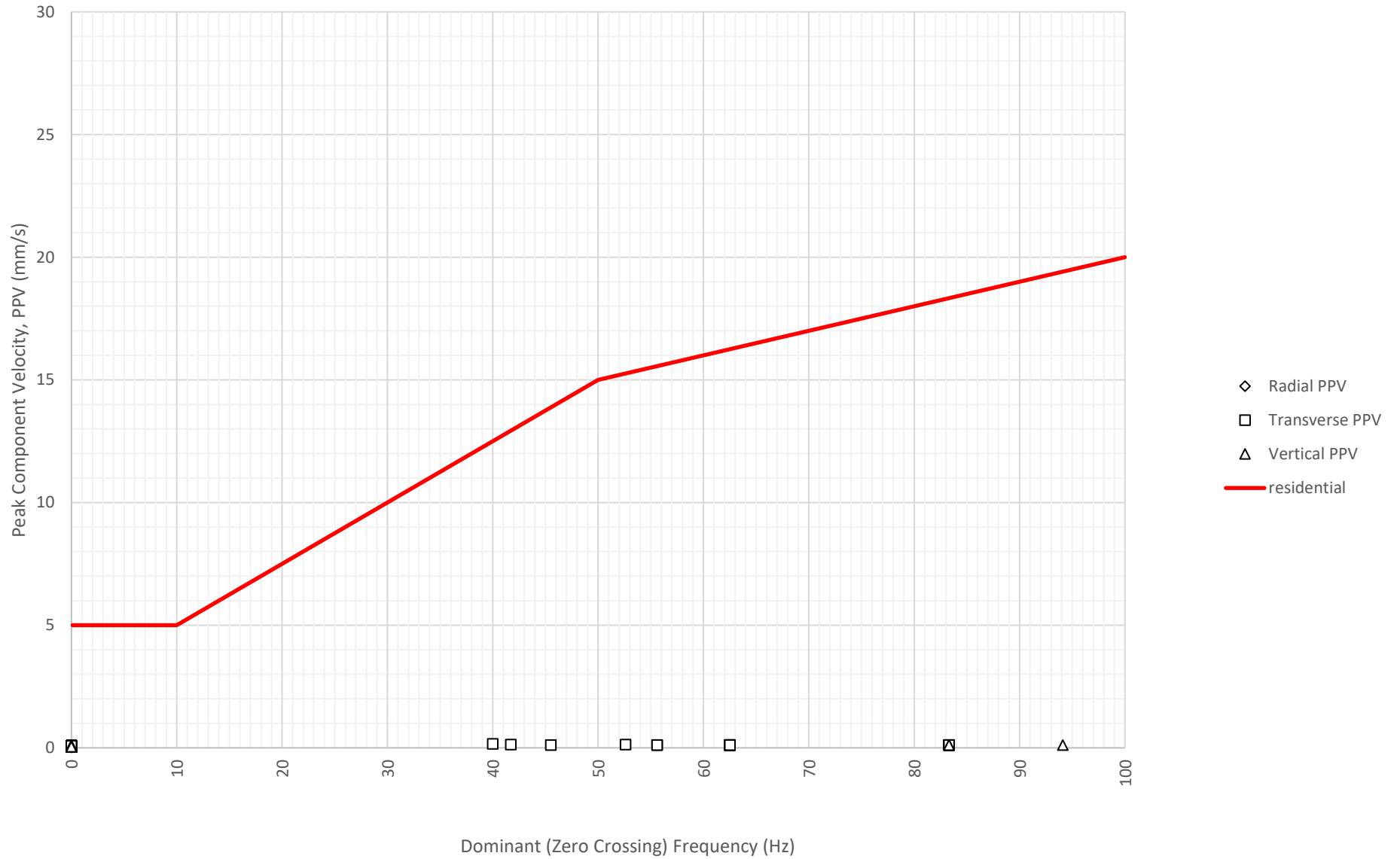
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on
12-08-2022



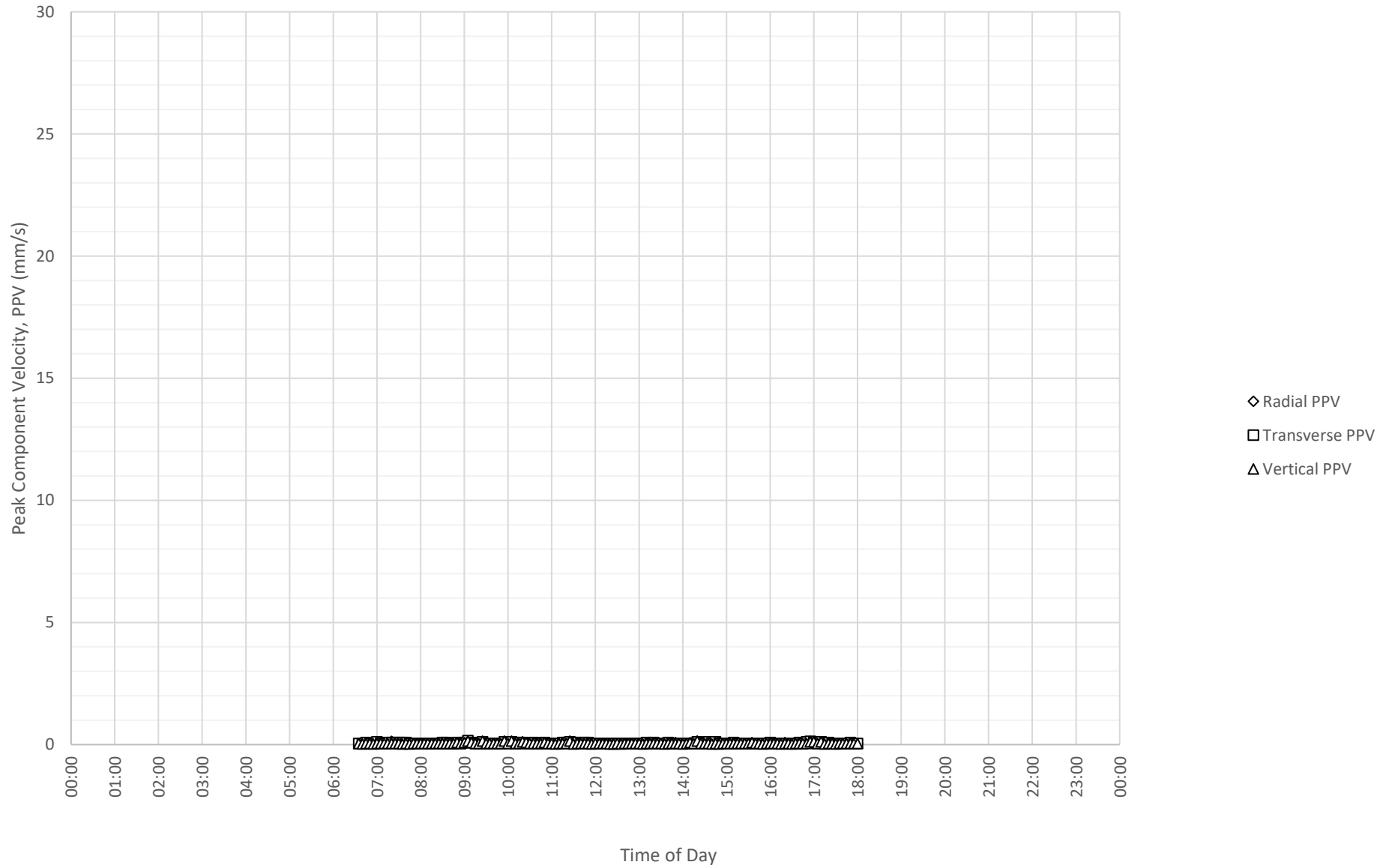
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 13-08-2022



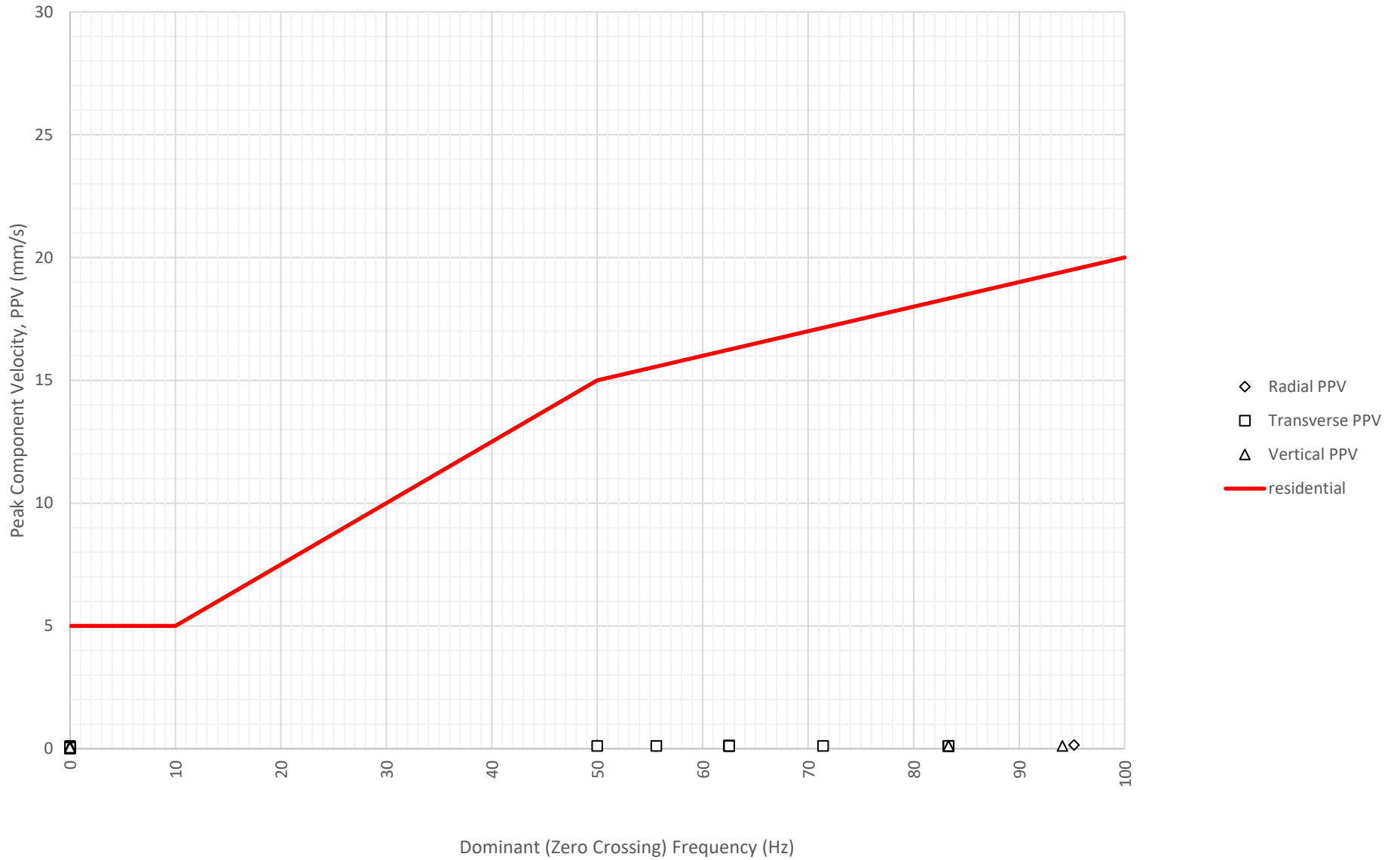
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 13-08-2022



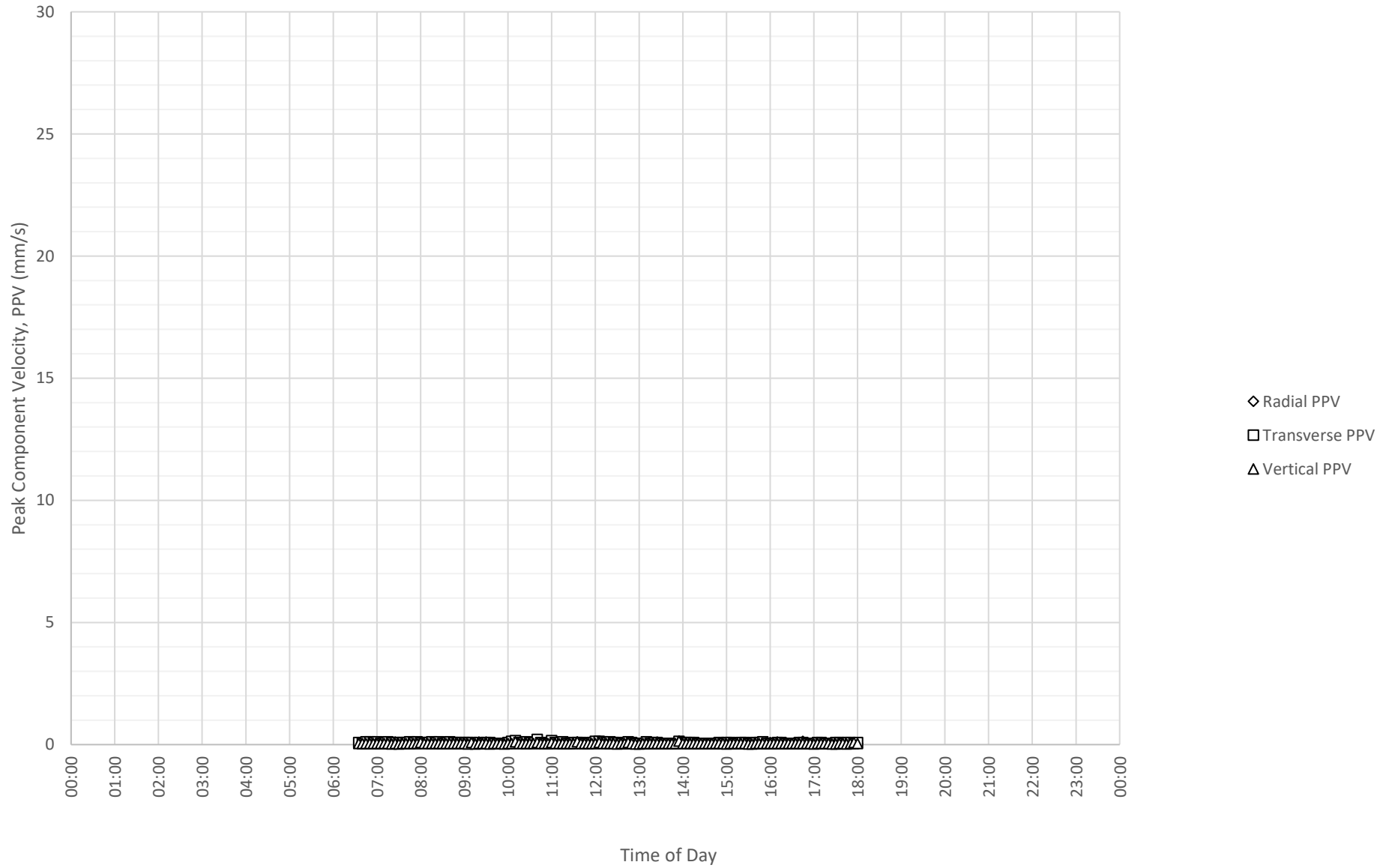
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 14-08-2022



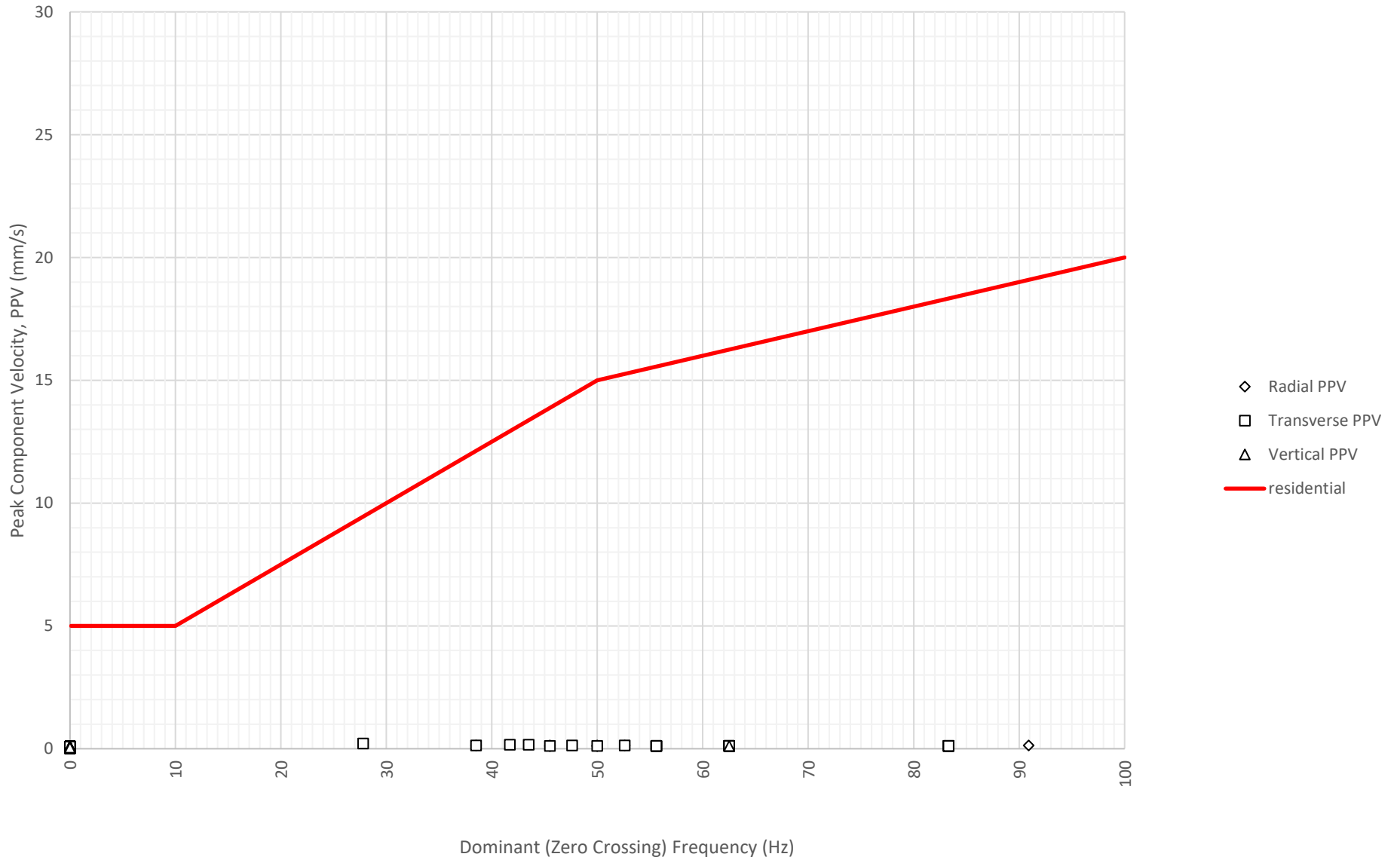
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 14-08-2022



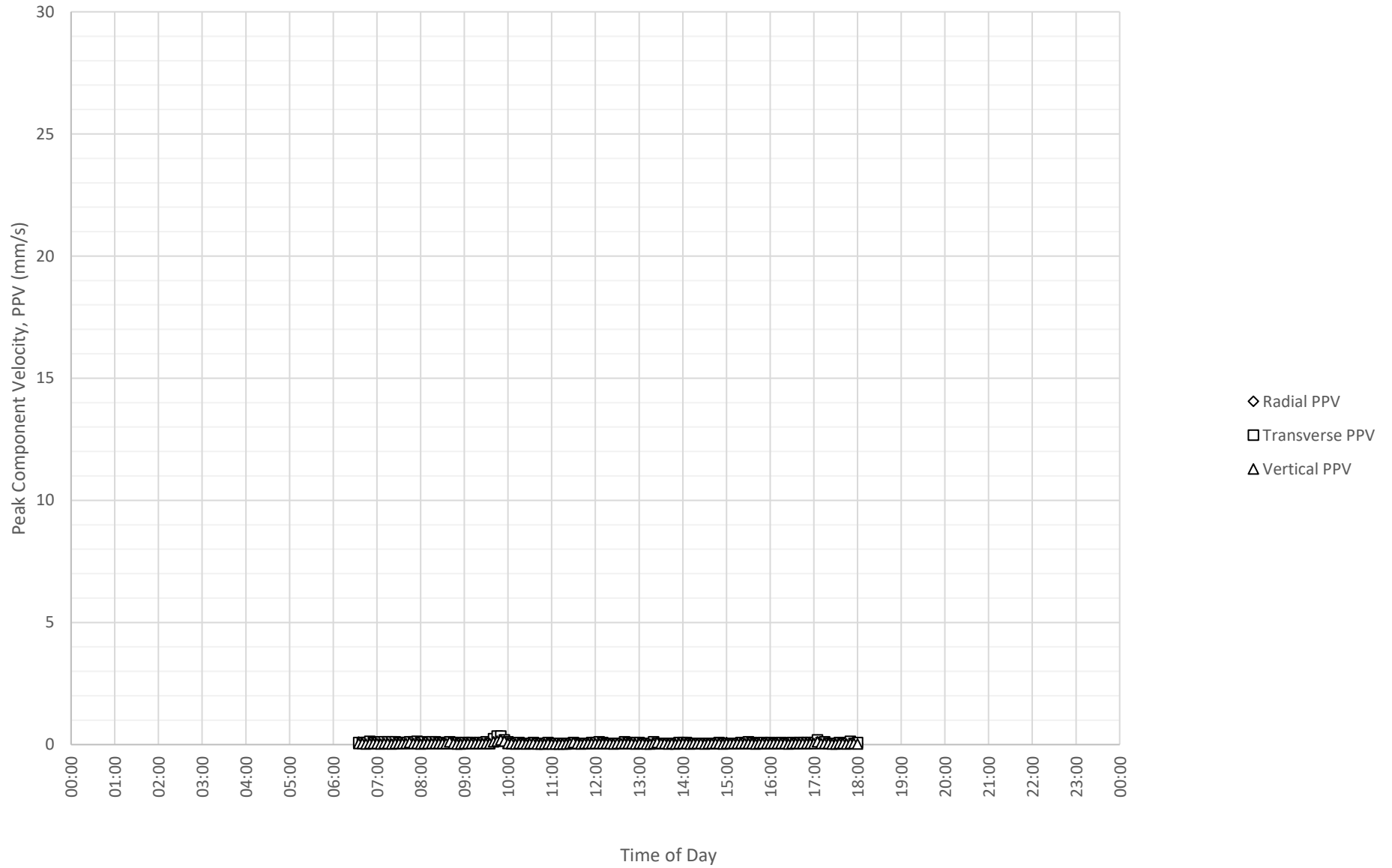
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 15-08-2022



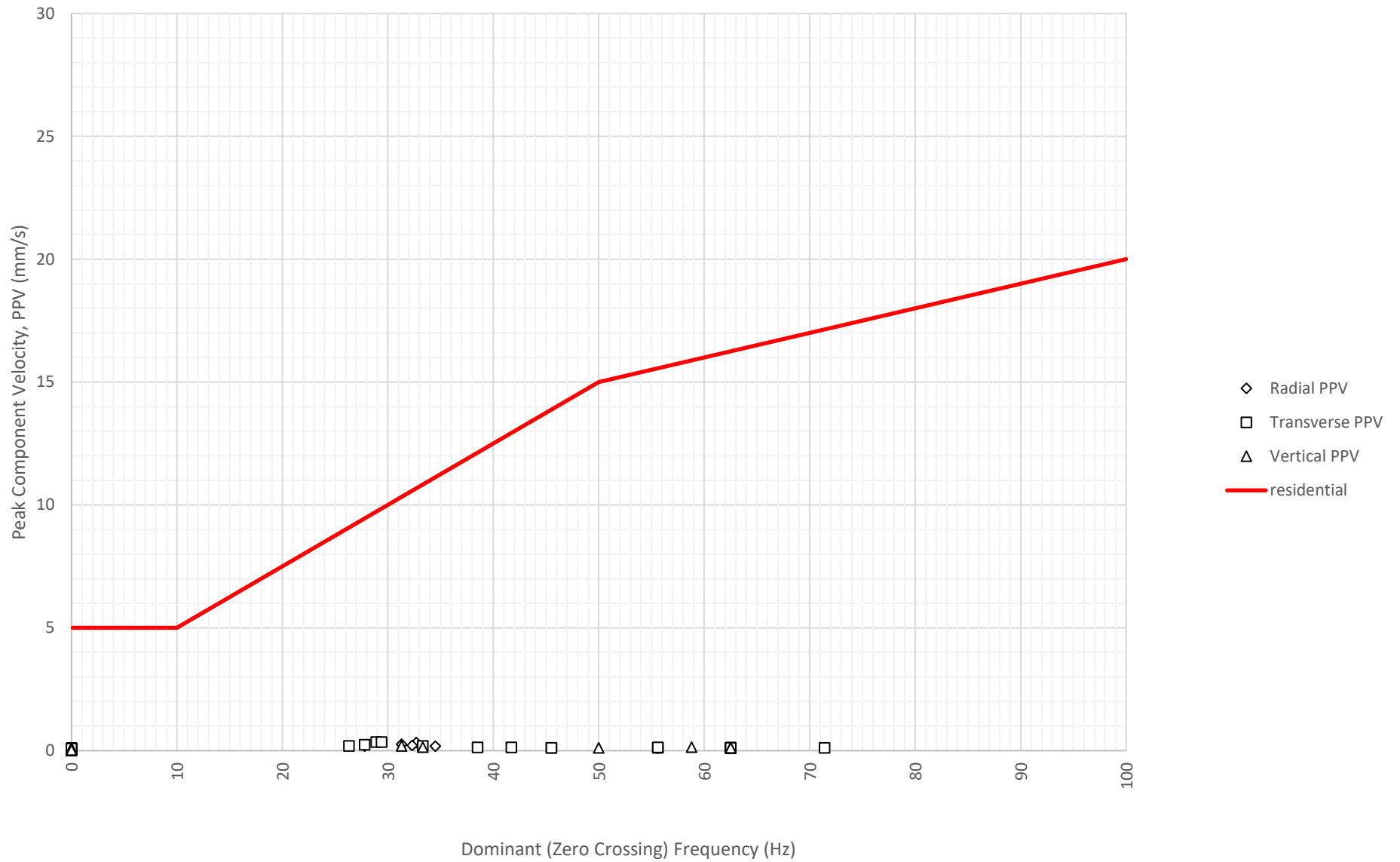
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 15-08-2022



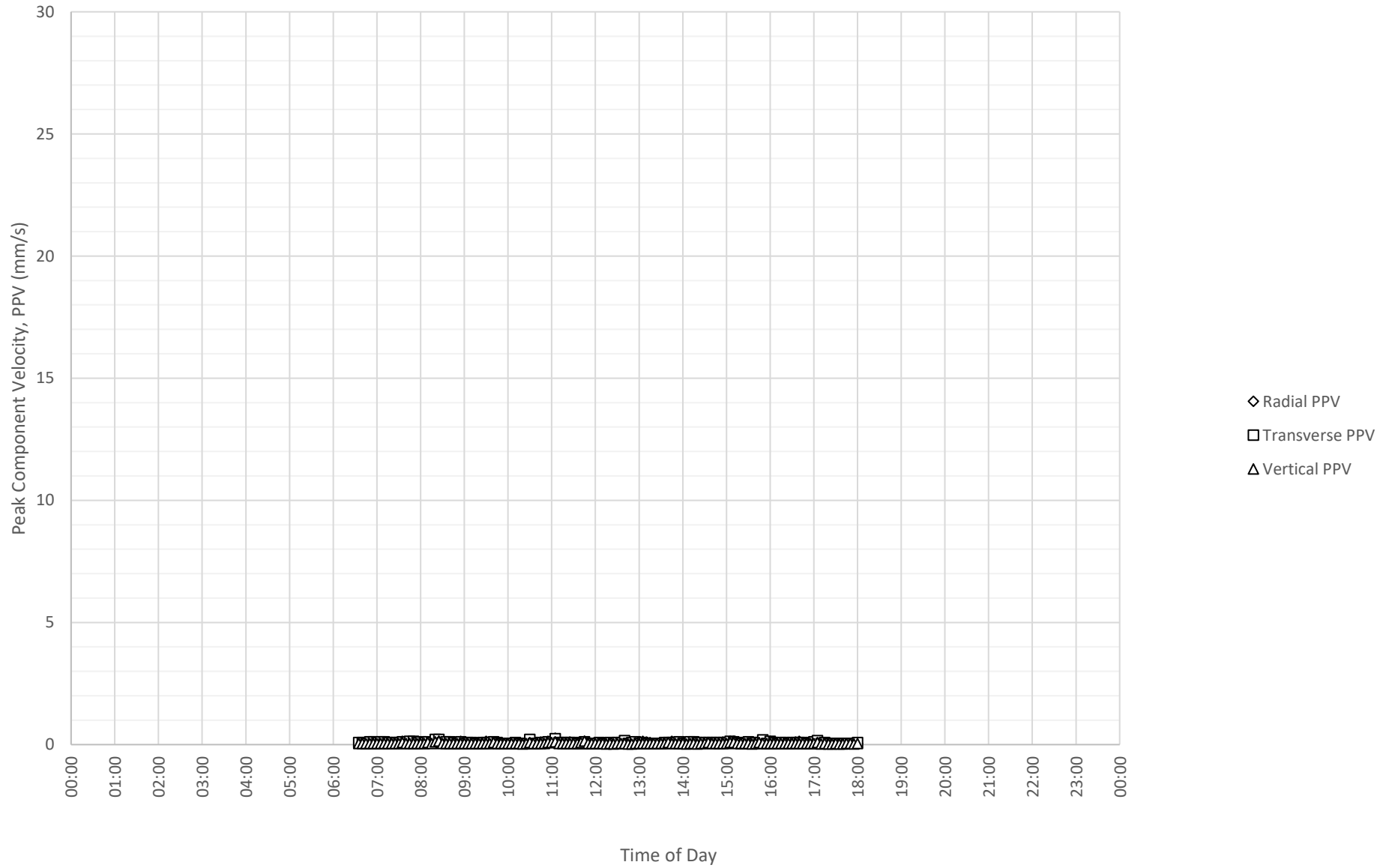
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 16-08-2022



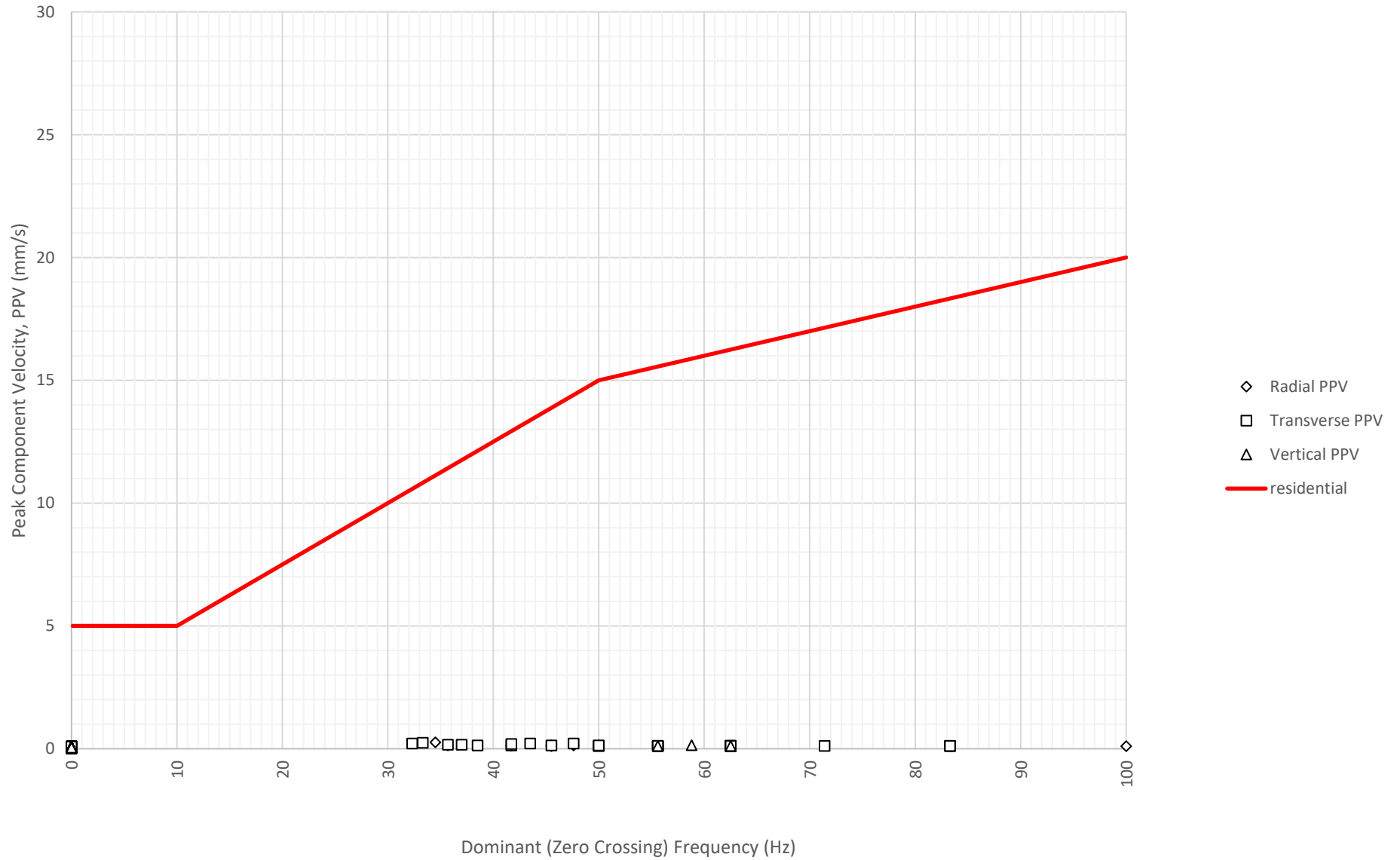
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 16-08-2022



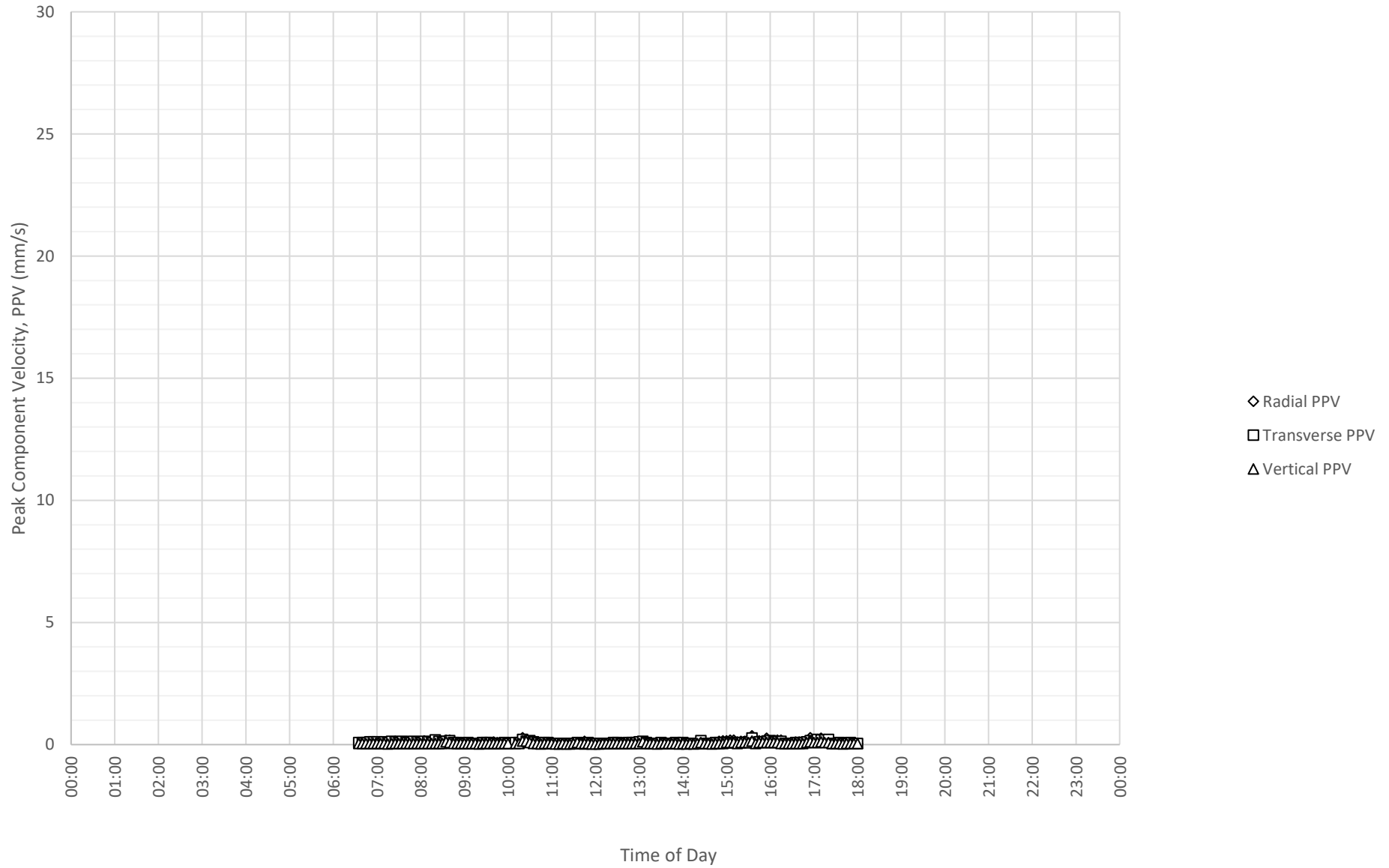
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 17-08-2022



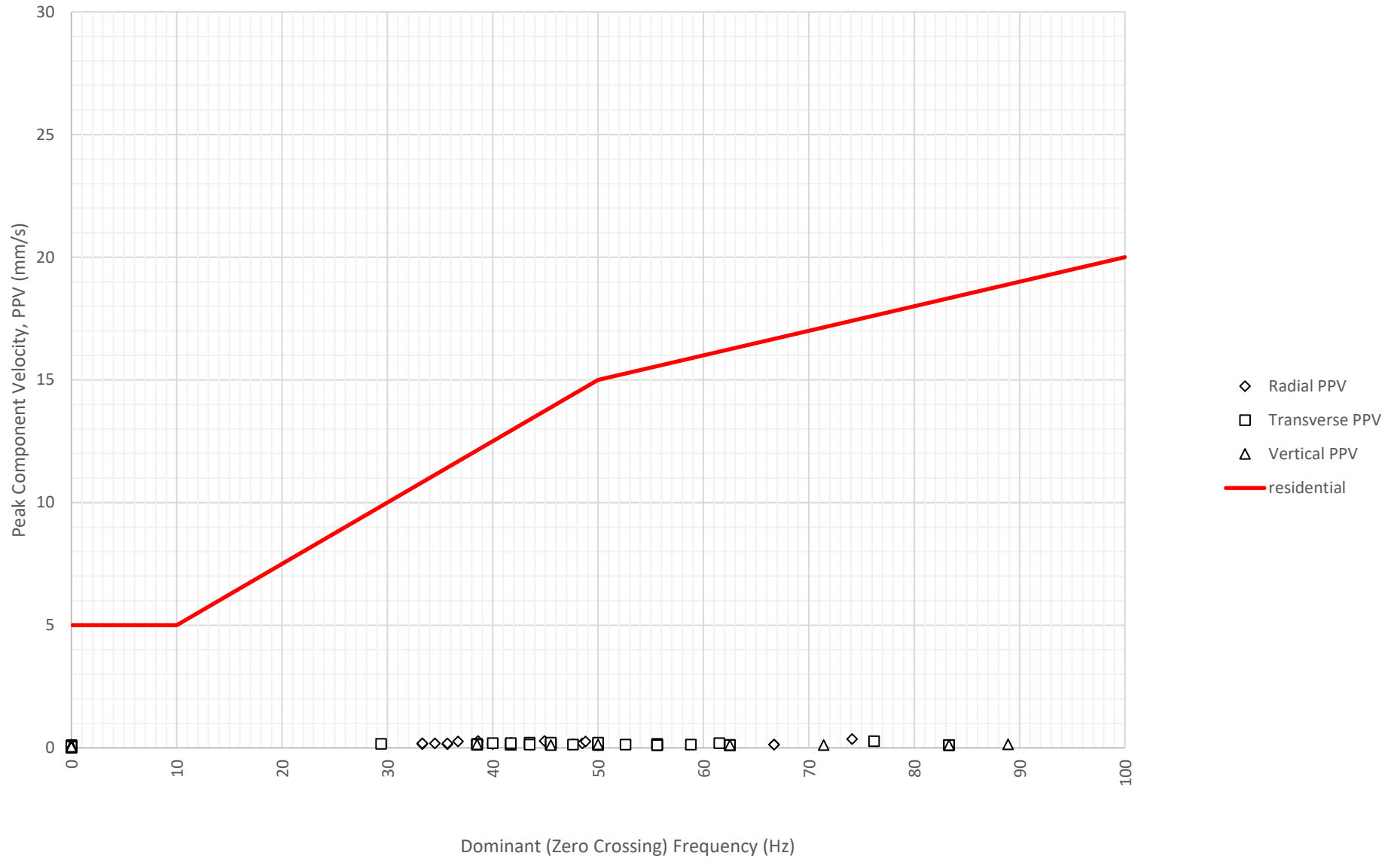
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 17-08-2022



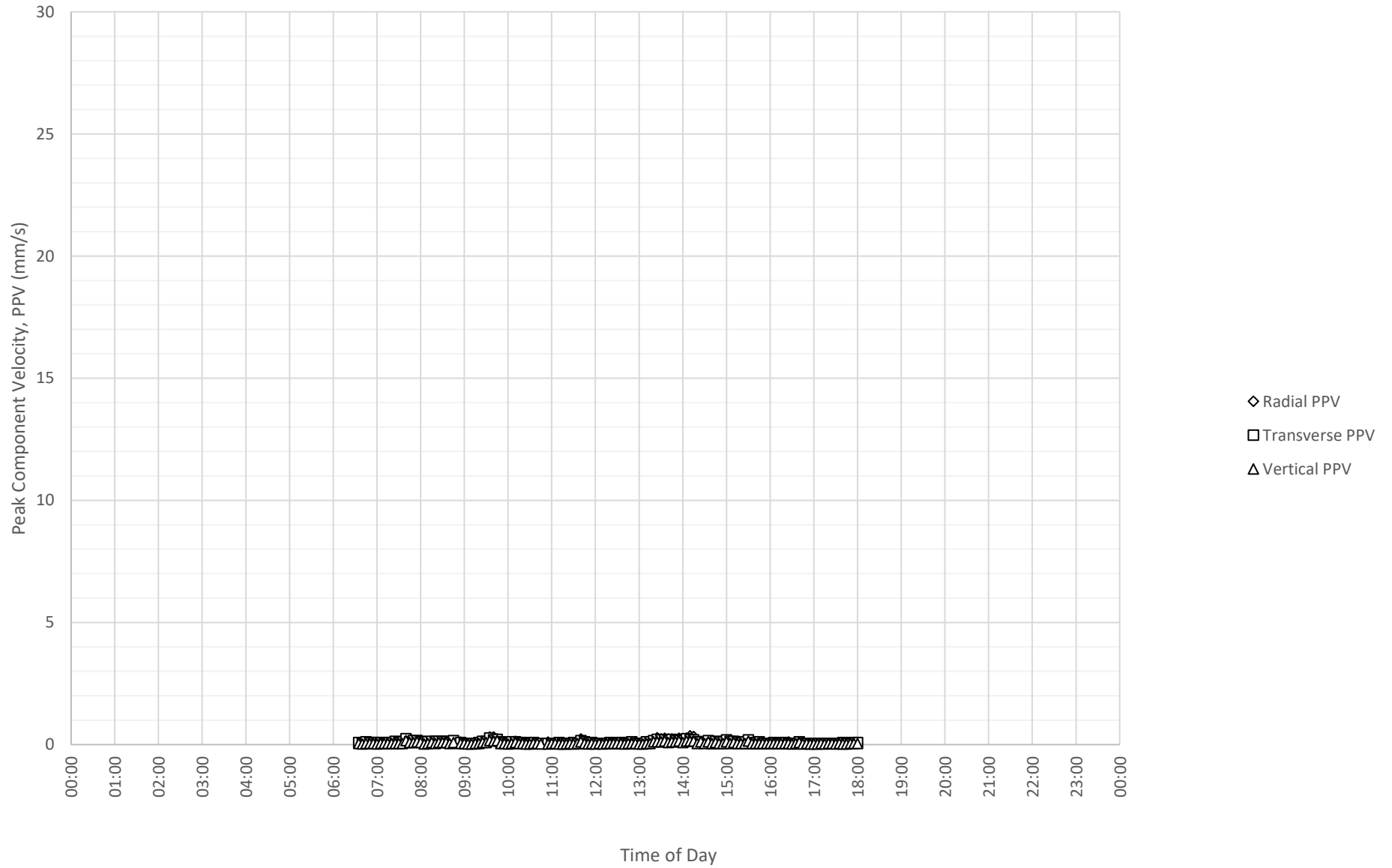
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 18-08-2022



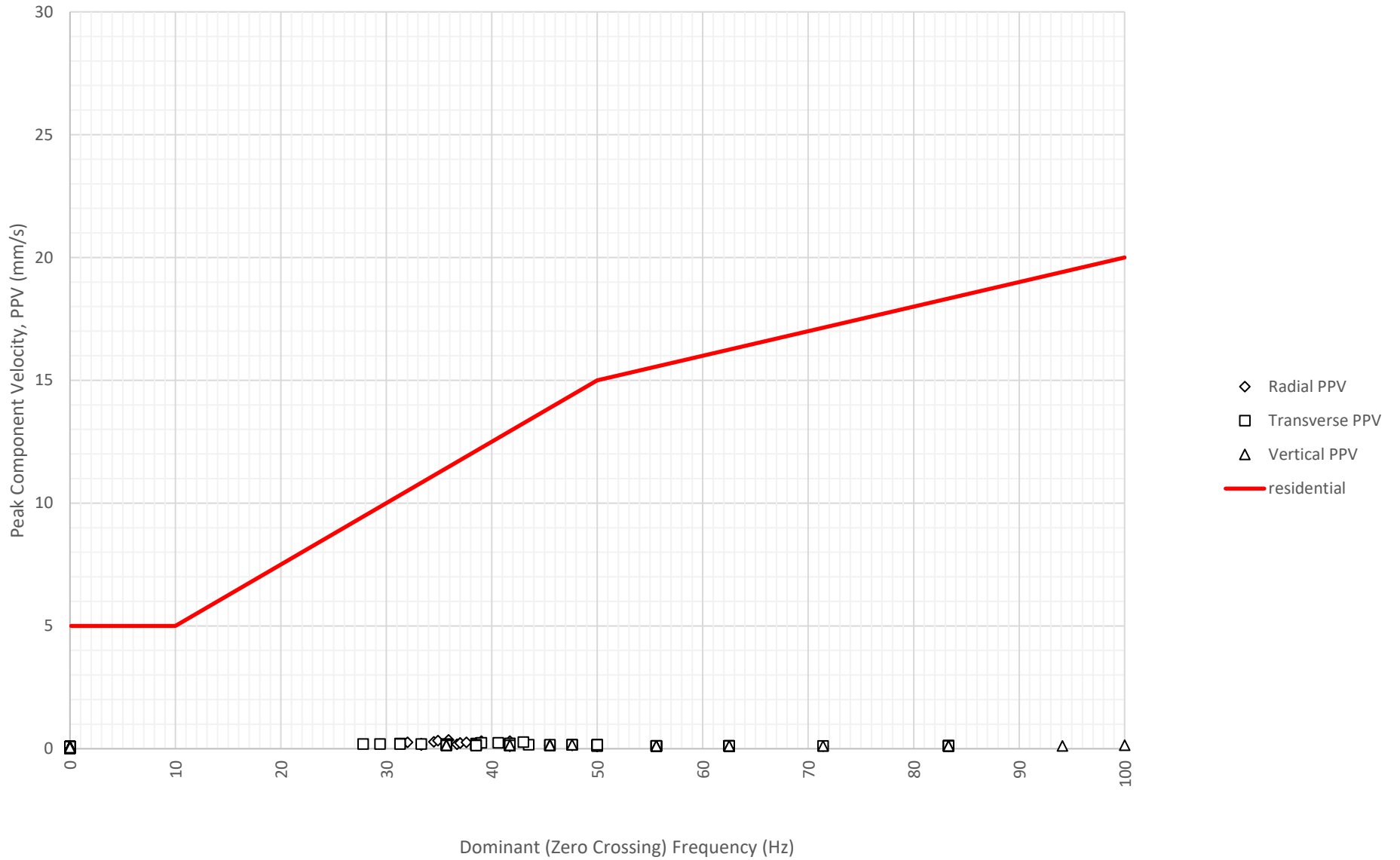
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 18-08-2022



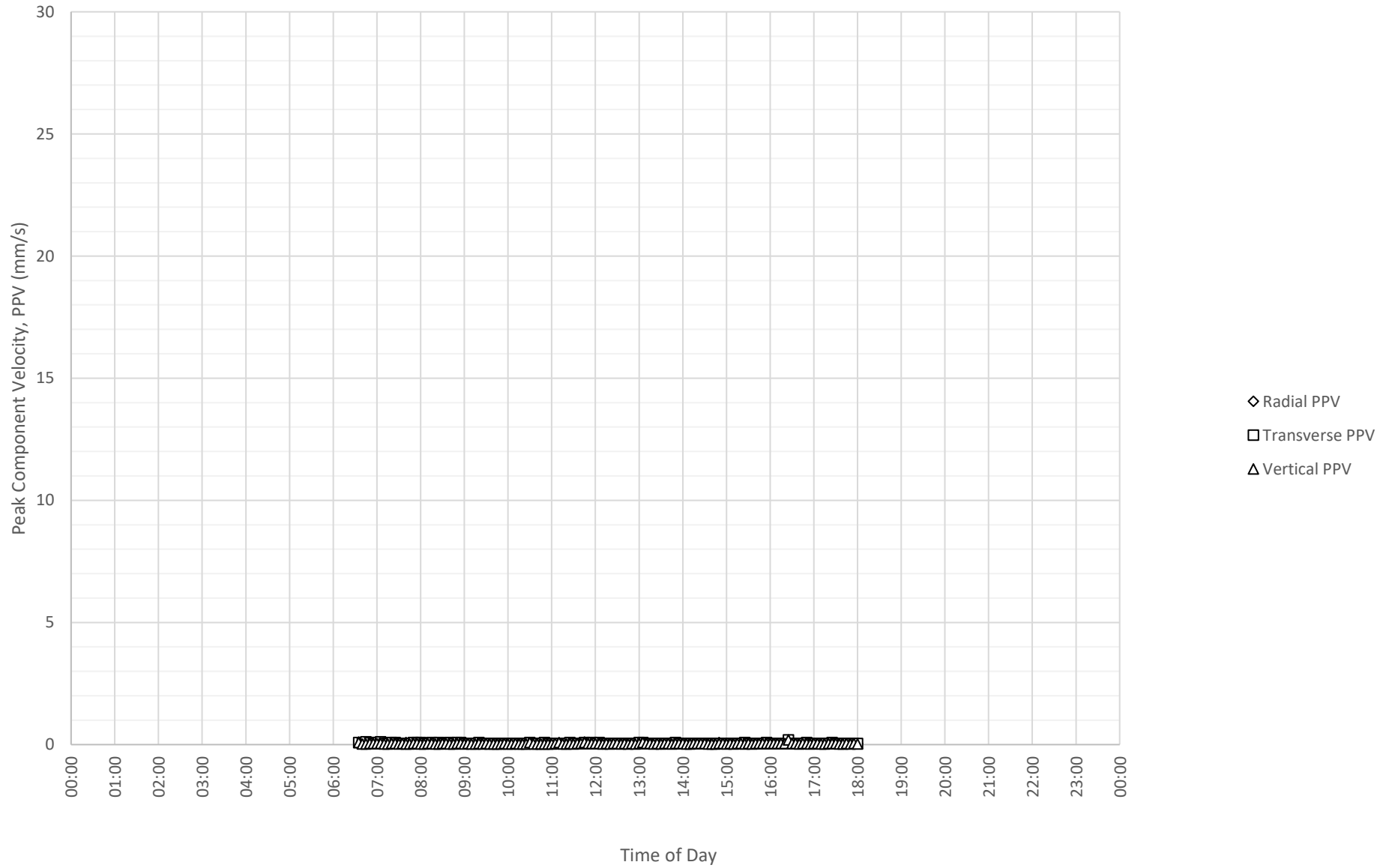
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 19-08-2022



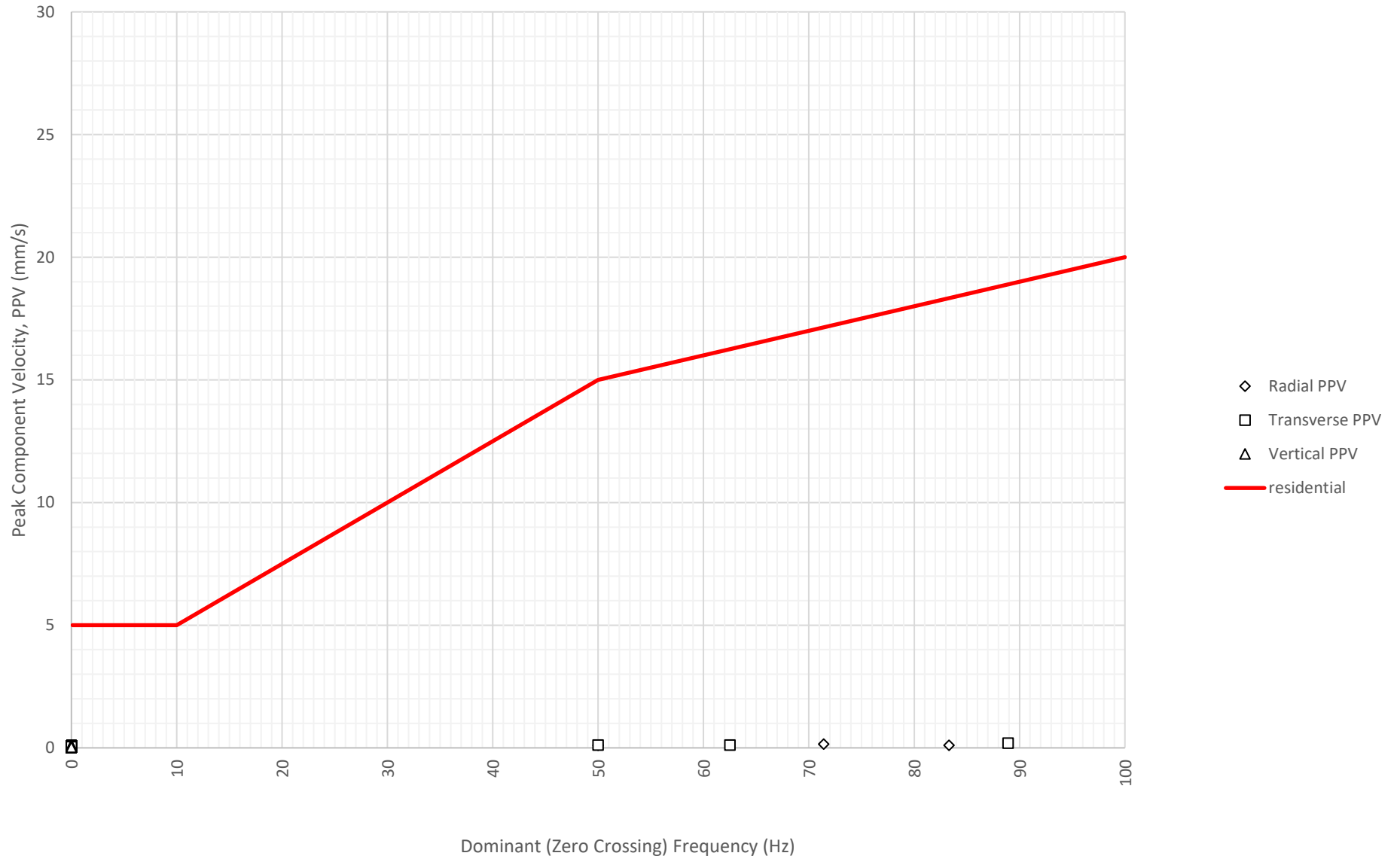
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 19-08-2022



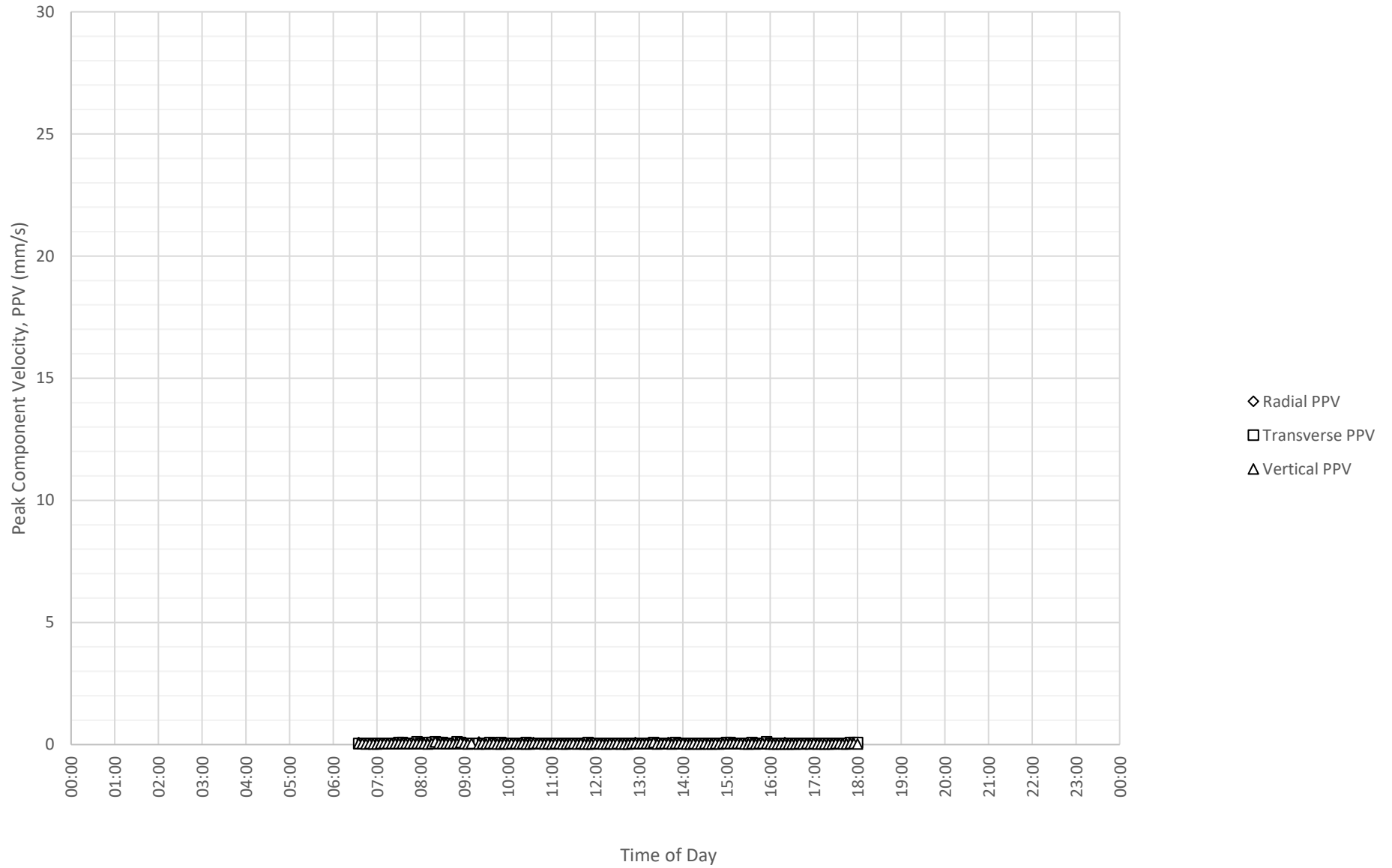
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 20-08-2022



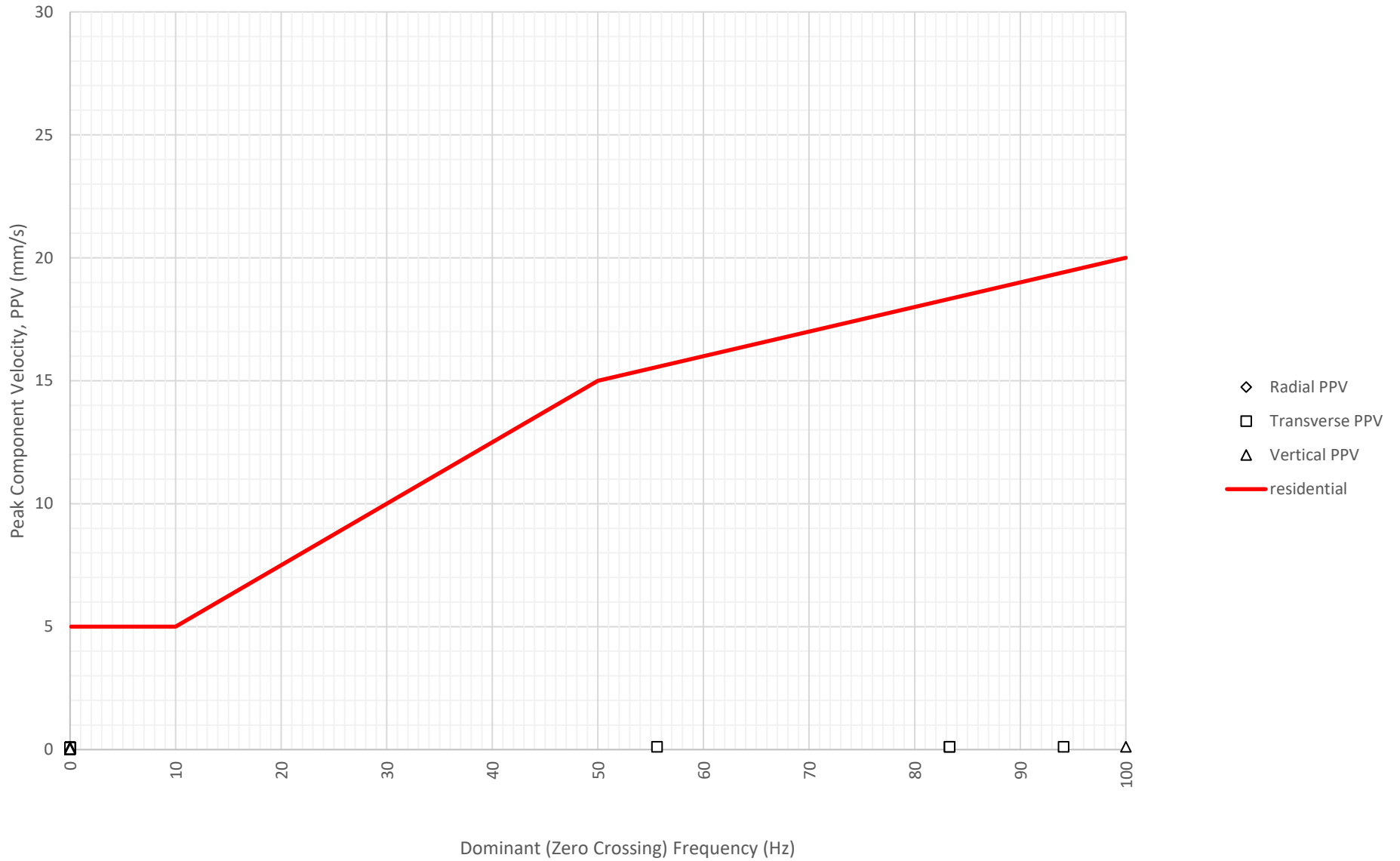
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 20-08-2022



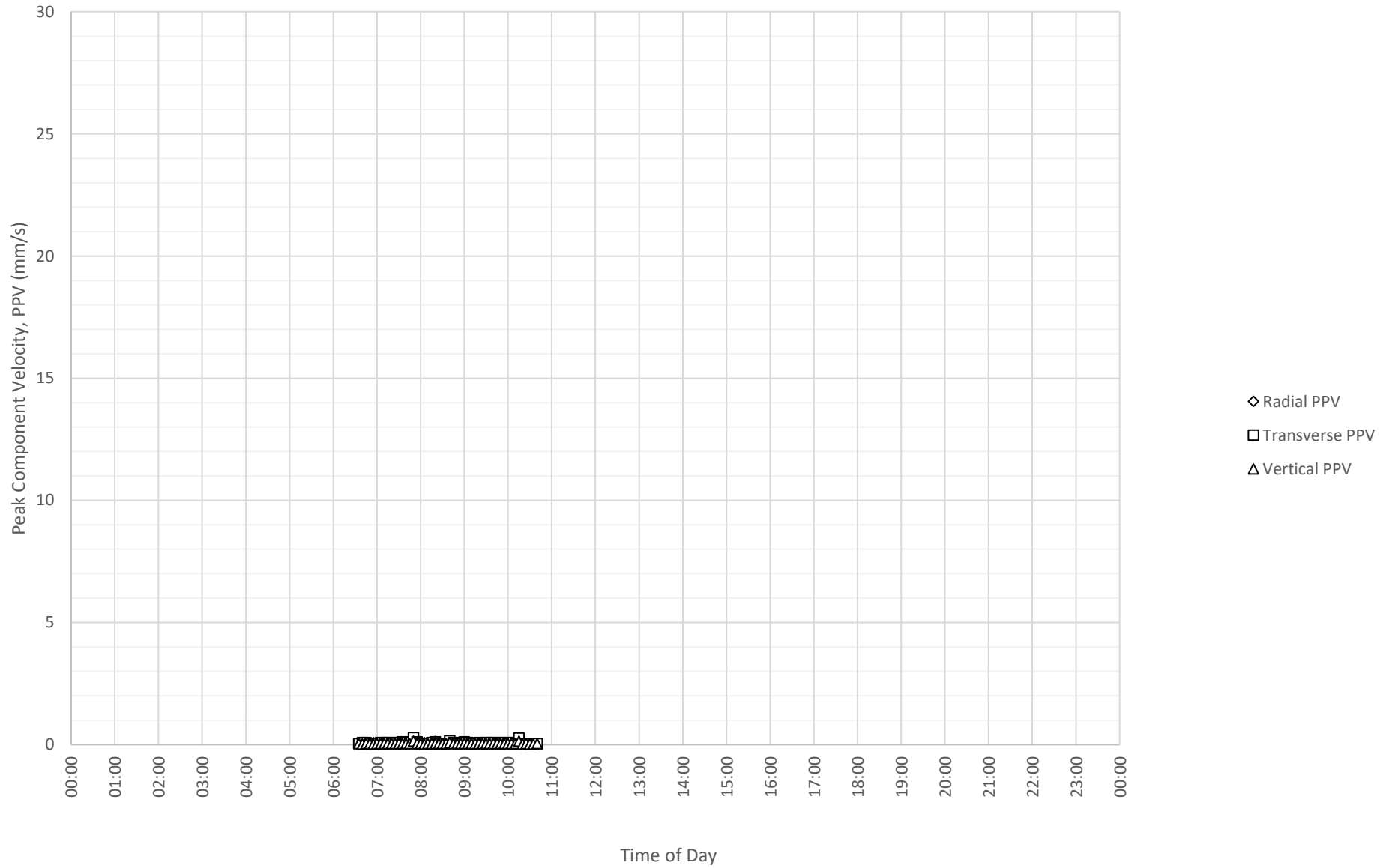
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 21-08-2022



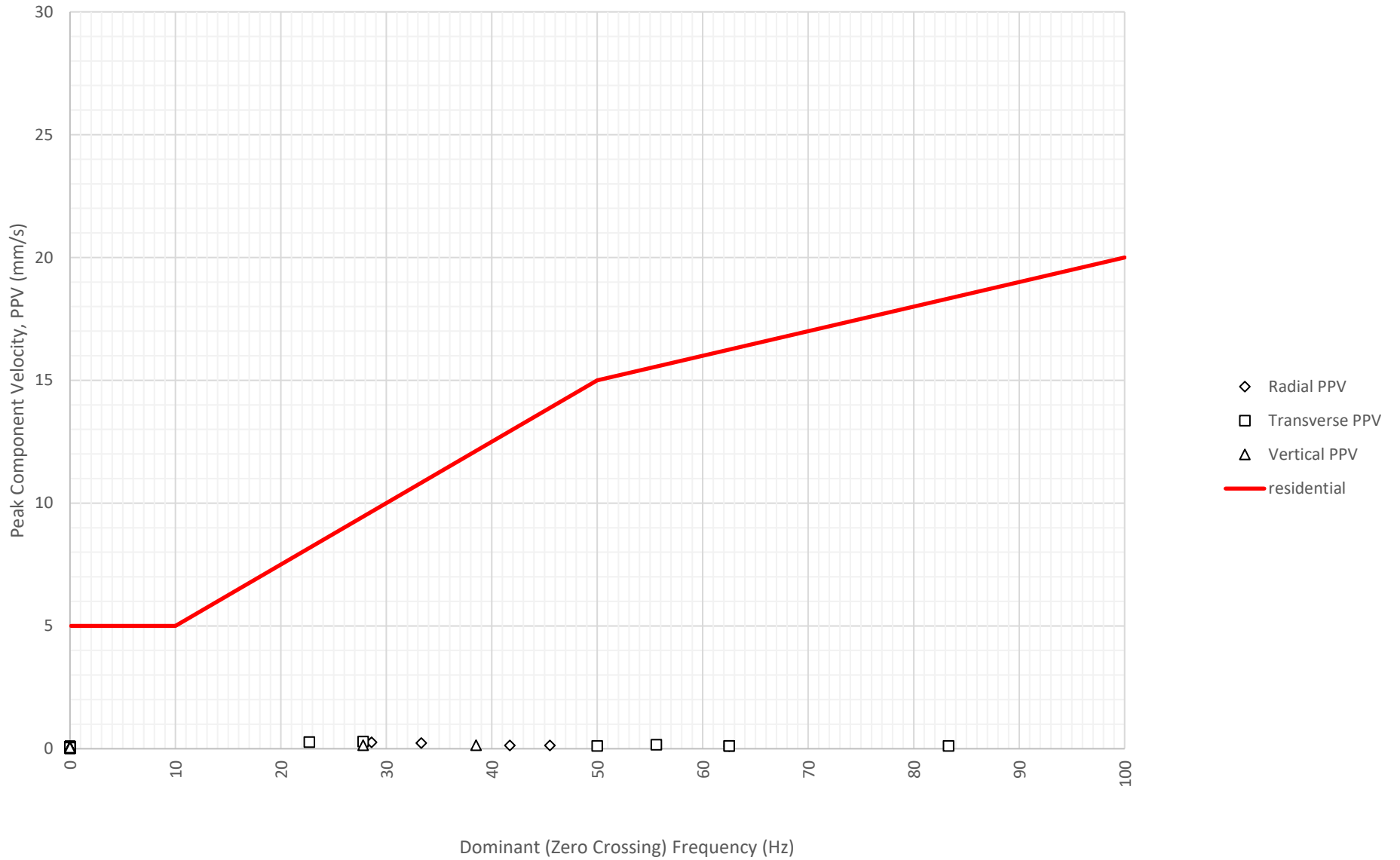
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 21-08-2022



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



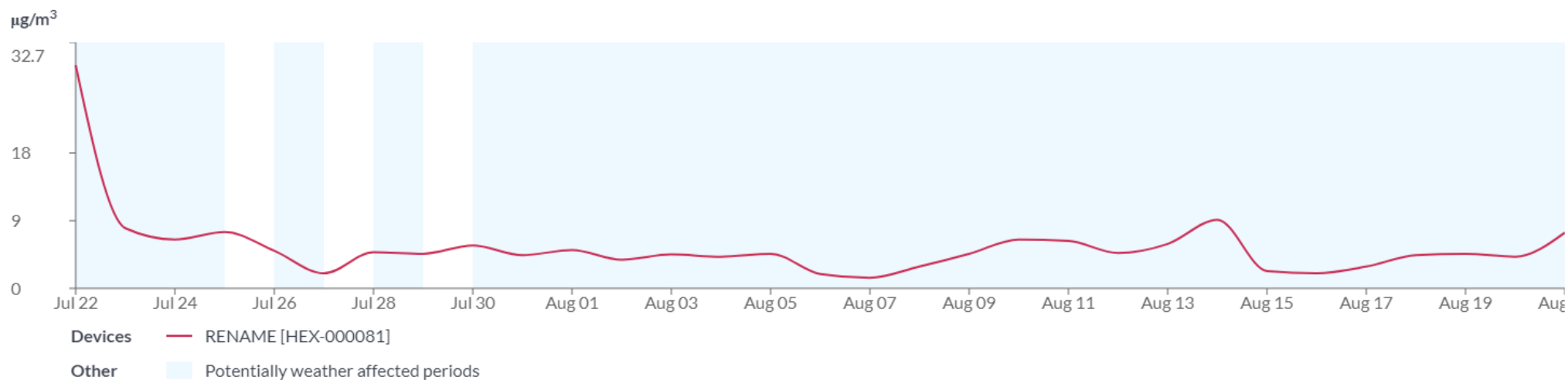
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 22-08-2022



APPENDIX 3 – DUST MONITORING RESULTS

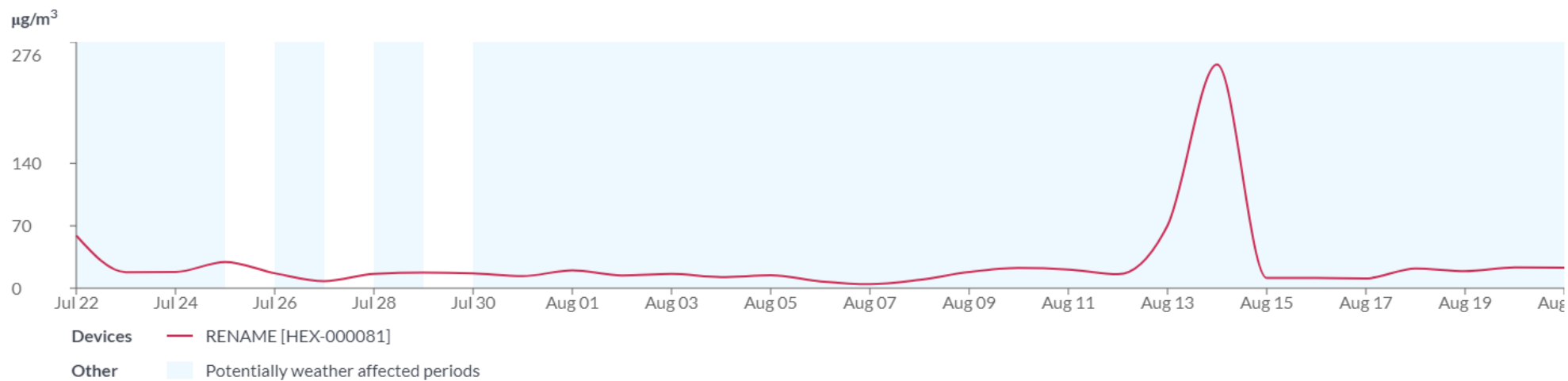
PM2.5

Jul 22 2022 - Aug 21 2022



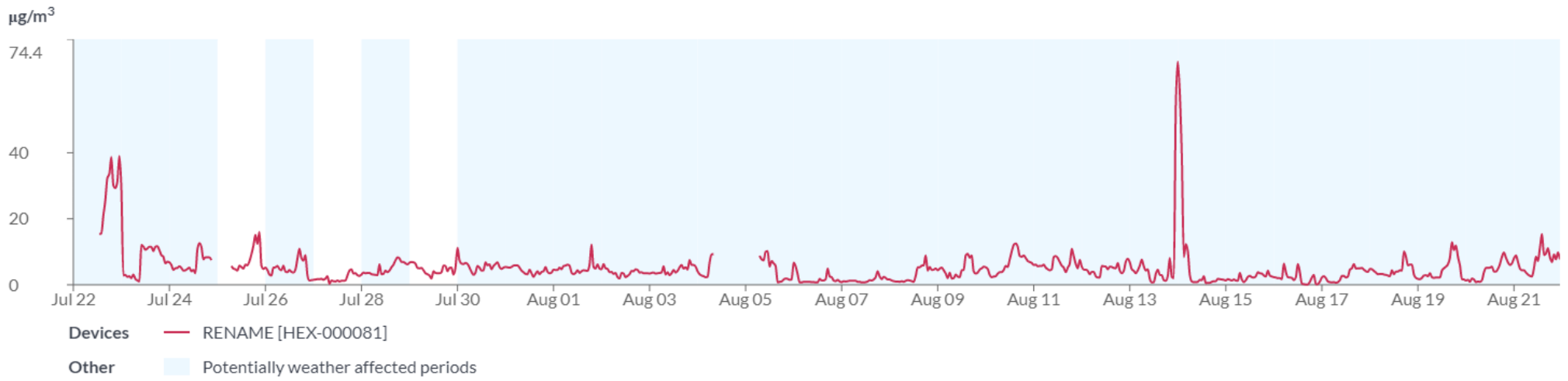
PM10

Jul 22 2022 - Aug 21 2022



PM2.5

Jul 22 2022 - Aug 21 2022



PM10

Jul 22 2022 - Aug 21 2022

