SLR Consulting Australia
10 Kings Road, New Lambton NSW 2305, Australia

26 March 2024

SLR Ref No.: 630.30321-L01V1.0-20240326.docx

Attention: Harry Egan
Aurizon Operations Limited
121 Woodstock Street
Mayfield, NSW 2304

SLR Project No.: 630.30321

Client Reference No.:

RE: Aurizon Port Services NSW Expansion
Addendum Noise Impact Assessment

1.0 Introduction

SLR Consulting Australia Pty Ltd (SLR) has been commissioned by Aurizon Operations Limited (Aurizon) to undertake an assessment of the potential impacts associated with the proposed expansion of the Aurizon Port Services NSW site (the Project) within the Port of Newcastle. A noise impact assessment (NIA) was prepared (refer SLR report 630.30321-R01-V2.0 *Aurizon Port Services NSW Expansion – Noise Impact Assessment* dated 27 March 2023) as part of the development application (DA-339886).

The purpose of this addendum report is to provide additional information and assessment in response to comments from the NSW Department of Planning and Environment and the NSW Environment Protection Authority.

The NIA remains the primary reference document and only the updated assessment and results are presented in this report. Additional information on assessment methodology, receivers and criteria is provided in the NIA.

2.0 Bullock Island Balloon Loop - Rail Noise Impacts

The NSW Department of Planning and Environment requested the following additional information:

Rail line Use

1. *The Department has received feedback from the community with concerns over noise associated with rail traffic using the rail balloon loop adjacent to Bourke Street. The Department requests you confirm the routes rail traffic will use to access the site and confirm any impacts this may have on traffic in the abovementioned balloon loop.*

There is limited data available on the total number of rail movements on the Bullock Island Rail Loop however data provided from ARTC indicates that from 12 months of data approximately 26 grain and mineral trains operate on Bullock Island per week with 14 of those movements using the Bullock Island Balloon Loop.

In order to quantify existing rail noise levels from the Bullock Island Balloon Loop a noise logger (SVAN957 s/n 23247) was placed in the front yard of 103 Bourke Street which is the nearest residence to the rail tracks on Bourke Street from Tuesday 10 October 2023 to Wednesday 18 October 2023. The noise logger was placed approximately 24 m from the centreline of the rail tracks.

The noise logger was set to continuously record ambient noise levels and carried current National Association of Testing Authorities (NATA) or manufacturer calibration certificates. Instrument calibration was conducted before and after each measurement, with the variation in calibrated levels not exceeding ±1.0 dB.

The logger data was analysed to identify individual train events where possible. For each confirmed train movement the L_{Aeq}, L_{Amax} and L_{AE} was calculated. A summary of each detected train movement is provided in **Table 1**. Other, less significant, train movements may have occurred over the monitoring period and were not able to be identified due to the influence of extraneous noise sources such as nearby commercial/industrial noise, general neighbourhood noise and road traffic.

Table 1: Individual Rail Movement Noise Levels - dBA

Date and Time	Event Duration (seconds)	L_{Aeq}	L_{AE}	L_{Amax}
14/10/2023 17:58	282	75	99	89
15/10/2023 19:26	405	73	99	87
15/10/2023 20:16	402	73	99	88
15/10/2023 22:21	304	69	93	85
16/10/2023 20:23	172	72	95	85

Overall noise levels during the noise monitoring period are provided in **Table 2**. Results are also presented graphically in **Appendix A**. Noise levels presented in **Table 2** are inclusive of all noise sources at the noise monitoring location and not just rail activity.

Table 2: Unattended Noise Monitoring Summary – 103 Bourke Street

Date	$L_{Aeq(15hour)}$	$L_{Aeq(9hour)}$	$L_{Aeq(1hour)}$ Day	$L_{Aeq(1hour)}$ Night
Tuesday 10 October 2023	56	51	57	55
Wednesday 11 October 2023	59	55	61	61
Thursday 12 October 2023	60	56	62	59
Friday 13 October 2023	57	52	58	54
Saturday 14 October 2023	55	53	55	58
Sunday 15 October 2023	58	54	62	58
Monday 16 October 2023	57	50	59	55
Tuesday 17 October 2023	57	54	59	58
Wednesday 18 October 2023	57	-	58	-
Overall	57	53	59	58

It should be noted that existing total $L_{Aeq(15hour)}$ and $L_{Aeq(9hour)}$ noise levels, inclusive of all noise sources are significantly below the NSW Rail Infrastructure Noise Guideline (RING) noise assessment trigger levels of 65 dBA $L_{Aeq(15hour)}$ and 60 dBA $L_{Aeq(9hour)}$, respectively.

The Project would result in an increase in rail movements to the site of up to twelve trains per week from an existing eight (8) per week. The trains would enter the site on Grain

Arrival Roads 1 or 2 and generally leave via the Bullock Island Balloon Loop. As such the Project would increase weekly train movements on the Bullock Island Ballon loop from approximately 14 per week to 18 per week, approximately one additional movement in any given day or night period.

Due to the relatively low number of movements during either the day or night-time period on any given day, a number of possible rail movement scenarios has been assessed as the potential rail traffic movements may not be uniformly distributed over a 24 hour period as is generally the case in other parts of the ARTC freight network. To provide a conservative assessment the highest measured rail noise level recorded over the monitoring period of L_{AE} 99 dBA has been used.

Table 3: Predicted Increase in Bullock Island Balloon Loop Rail Noise Levels – Nearest Residential Receiver

Rail Movement Scenario	Existing		Existing and Project Related		Project Related Increase	
	$L_{Aeq(15hour)}$ dBA / (Movements)	$L_{Aeq(9hour)}$ dBA / (Movements)	$L_{Aeq(15hour)}$ dBA / (Movements)	$L_{Aeq(9hour)}$ dBA / (Movements)	Day dB	Night dB
Movements equally distributed day and night	52 / (1)	54 / (1)	55 / (2)	57 / (2)	**3.0**	**3.0**
Additional movement coincides with existing daytime only movements	55 / (2)	-	57 / (3)	-	**1.8**	-
Additional movement coincides with existing night-time only movements	-	57 / (2)	-	59 / (3)	-	**1.8**

A review of **Table 3** indicates that a Project related increase of 3 dB is predicted where Project related rail movements coincide with an existing rail movement during the day or night period. Where a Project related rail movement coincides with two (2) existing rail movements in the day or night period a Project related increase of 1.8 dB is predicted. In all cases noise levels would be below the NSW Rail Infrastructure Noise Guideline trigger levels of 65 dBA $L_{Aeq(15hour)}$ and 60 dBA $L_{Aeq(9hour)}$ respectively. Given that the Project related increase would not lead to an exceedance of the day or night-time noise assessment trigger levels the Project does not trigger the assessment of reasonable and feasible noise mitigation.

Existing rail movements on the Bullock Island Balloon Loop exceed the maximum pass-by (L_{Amax}) noise assessment trigger level of 85 dBA with existing movements generating maximum noise levels of up to 89 dBA. Given that there would be no change to the types of trains associated with the existing rail movements on the Bullock Island Balloon Loop due to the Project, in accordance with the assessment procedures detailed in Appendix 2 of the RING no additional consideration of mitigation measures is required.

Notwithstanding, Aurizon is unable to implement mitigation measures on ARTC operated infrastructure to mitigate noise from rail operations associated with network proximity to sensitive receivers or a wheel rail interface issue. However, Aurizon ensures that all rollingstock operated complies with Environment Protection Licence 21379, network access agreements and is maintained in compliance with their safety management system. Further, all train drivers comply with network operational requirements and consider route operational guidance documentation.

3.0 Updated Operational Noise Impact Assessment

Following comments received from the NSW EPA in *Request Additional Information – Integrated Development – DA-33986* reference DOC23/605231-7 dated 18 July 2023 an updated assessment of on-site operations has been conducted. The computer noise model developed for the NIA has been updated based on various information updates and additional noise monitoring conducted at the site since the NIA. The main changes include:

- Inclusion of train movements on the private siding servicing the site.
- Updated sound power levels for handling of containerised cement based on measurements conducted on-site.
- Additional noise modelling scenarios for proposed expanded operational activities.
- Spatial distribution of noise sources such as forklifts and reach stackers operating in defined areas under typical loading/unloading cycles.

The noise model has been updated to assess the following representative maximum site operational conditions:

- Scenario 1 - Existing Operations. This scenario reflects the use of the site prior to the proposed expansion of the shed and handling of containerised cement. The scenario assumes that a ship would be being loaded while a train is unloaded via forklift at the north of the site.
- Scenario 2 – Expanded operations including containerised cement handling. This scenario reflects the use of the site following the proposed expansion of the shed and handling of containerised cement. The scenario assumes that a ship would be being loaded while a train is unloaded via forklift at the north of the site. Concurrently a truck would be loaded with containerised cement via reach stacker at the south of the site.
- Scenario 3 – Expanded operations including containerised cement unloading. This scenario reflects the use of the site following the proposed expansion of the shed and handling of containerised cement. The scenario assumes that a ship would be being loaded while a train of containerised cement is unloaded via reach stacker at the south of the site.

The scenarios and associated Sound Power Levels of plant and equipment is provided in **Table 4**.

Table 4: Noise Modelling Scenarios and Equipment Sound Power Levels

Noise Source	Sound Power Level - dBA L_{Aeq} (L_{Amax})	Typical Duration of Use in 15 Minute Period	Source Height (m)
Scenario 1 - Existing Operations			
Conveyor	66 per m	15 minutes	1 to 15
Tipler Building	94	15 minutes	8
Forklift	105 (112)	15 minutes	1.5
Shiploader	96	15 minutes	15
Warehouse	76 (internal reverberant sound pressure level)	15 minutes	-
Train	101 (113)	15 minutes	2
Scenario 2 - Expanded operations including containerised cement handling			
Conveyor	66 per m	15 minutes	1 to 15
Tipler Building	94	15 minutes	8
Forklift	105 (112)	15 minutes	1.5
Shiploader	96	15 minutes	15
Warehouse	76 (internal reverberant sound pressure level)	15 minutes	-
Train	101 (113)	15 minutes	2
Reach Stacker	105 (123)	8 minutes	2
Truck	102 (108)	8 minutes	1.5
Scenario 3 – Expanded operations including containerised cement unloading			
Conveyor	66 per m	15 minutes	1 to 15
Shiploader	96	15 minutes	15
Warehouse	76 (internal reverberant sound pressure level)	15 minutes	-
Train	101 (113)	15 minutes	2
Reach Stacker	105 (123)	15 minutes	2

A summary of the updated noise modelling results is provided in **Table 5**.

Table 5: Predicted Operating $L_{Aeq(15minute)}$ and L_{Amax} Noise Levels

Receiver ID	Period	Scenario 1			Scenario 2			Scenario 3			Noise Criteria	
		Standard	Noise Enhancin	LAmax	Standard	Noise Enhancin	LAmax	Standard	Noise Enhancin	LAmax	PNTL	SDNL
R1	Day	33	35	-	35	38	-	35	38	-	49	-
	Evening	33	35	-	35	38	-	35	38	-	48	-

Receiver ID	Period	Scenario 1			Scenario 2			Scenario 3			Noise Criteria	
		Standard	Noise Enhancin	LAmax	Standard	Noise Enhancin	LAmax	Standard	Noise Enhancin	LAmax	PNTL	SDNL
	Night	33	35	50	35	38	**56**	35	38	**56**	43	55
R2	Day	40	42	-	40	43	-	36	38	-	49	-
	Evening	40	42	-	40	43	-	36	38	-	48	-
	Night	40	42	52	40	43	55	36	38	55	43	55
R3	Day	38	41	-	39	42	-	38	41	-	49	-
	Evening	38	41	-	39	42	-	38	41	-	48	-
	Night	38	41	52	39	42	**61**	38	41	**61**	43	55
R4	Day	33	36	-	35	37	-	33	35	-	49	-
	Evening	33	36	-	35	37	-	33	35	-	48	-
	Night	33	36	49	35	37	**58**	33	35	**58**	43	55
R5	Day	28	31	-	34	37	-	36	39	-	52	-
	Evening	28	31	-	34	37	-	36	39	-	48	-
	Night	28	31	44	34	37	58	36	39	57	43	61
R6	Day	39	42	-	41	44	-	40	44	-	45	-
	Evening	39	42	-	41	44	-	40	44	-	45	-
	Night	39	42	52	41	**44**	**61**	40	**44**	**61**	43	55

1. Values in bold indicate an exceedance of the relevantProject Noise Trigger Level or Sleed Disturbnance Noise Level criterai

Noise from the Project is predicted to comply with the Project Noise Trigger Levels (PNTLs) at all receivers under standard meteorological conditions. Under noise-enhancing weather conditions, the night-time period at receivers in Stockton are predicted to exceed the PNTL by a negligible 1 dB from expanded operational activities.

Given the conservative nature of the assessment, and the limited occasions that noise enhancing meteorological conditions would coincide with maximum site operations during the night-time (i.e concurrent shiploading, train unloading and cement handling), the cost and operational constraint on the installation of mitigation to the reach stacker may not be warranted. Notwithstanding, it is recommended that verification noise monitoring be conducted, and appropriate mitigation measures be implemented should offsite noise levels be found to exceed the PNTLs. In all cases best practice noise mitigation and management strategies at the site should be implemented as detailed in the NIA.

Due to stacking/loading of containers, maximum noise levels are predicted to be 61 dBA in Stockton and Carrington and exceed the sleep disturbance noise level trigger for receivers by up to 6 dB. It should be noted that this predicted L_{Amax} noise level is due to the loading of containers onto trucks or stacking on top of each other and does not occur for the duration of handling containers, or for every container movement.

Based on studies into sleep disturbance, the NSW Road Noise Policy concludes that:

- Maximum internal noise levels below 50 dBA to 55 dBA are unlikely to cause awakening reactions; and that
- One or two noise events per night, with maximum internal noise levels of 65 dBA to 70 dBA, are not likely to affect health and wellbeing significantly.

Internal noise levels in a dwelling, with the windows open, are commonly 10 dB lower than external noise levels. Therefore, the first conclusion above suggests that short-term external noises of 60 dBA to 65 dBA would result in internal noise levels of 50 dBA to 65 dBA and are unlikely to cause awakening reactions. Maximum external noise levels of up to 61 dBA are predicted at the nearest receivers in Stockton and Carrington. This would result in internal noise levels of up to 51 dBA for residents in Stockton and Carrington and would be unlikely to cause awakening reactions. It is also noted that noise monitoring conducted as part of the NIA and this Addendum indicates that maximum external noise levels during the night-time period routinely exceed 61 dBA, and as such noise levels from the Project are unlikely to have an adverse impact on the acoustic amenity of surrounding residential areas.

4.0 Conclusion

An addendum noise impact assessment has been conducted to assess the potential noise impacts from the Aurizon Port Services NSW (APSN) development expansion at the Port of Newcastle.

$L_{Aeq(15hour)}$ or $L_{Aeq(9hour)}$ rail traffic noise levels from the Bullock Island Ballon Loop are predicted to increase by up to 3 dB due to additional rail traffic generated by the Project. Overall $L_{Aeq(15hour)}$ and $L_{Aeq(9hour)}$ noise levels are predicted to remain below the NSW Rail Infrastructure Noise Guideline trigger levels of 65 dBA $L_{Aeq(15hour)}$ and 60 dBA $L_{Aeq(9hour)}$ respectively.

As there would be no change from the Project to the types of trains already using the Bullock Island Ballon Loop there would no change to the maximum train pass-by noise level [L_{Amax} (95th percentile)] as a result of the Project.

Operational noise levels are predicted to exceed the PNTL by a negligible 1 dB at the nearest receivers in Stockton. It is recommended that best practice noise mitigation and management strategies continue to be implemented at the site and that further mitigation measures as appropriate be implemented should verification monitoring find noise levels exceed the PNTLs.

Maximum noise levels from the site are unlikely to cause awakening reactions at the nearest most potentially affected receivers in Carrington and Stockton.

I trust the above meets current requirements. If you have any questions or require any further information please do not hesitate to contact me on 02 4037 3200 or mdavenport@slrconsulting.com.

Regards,

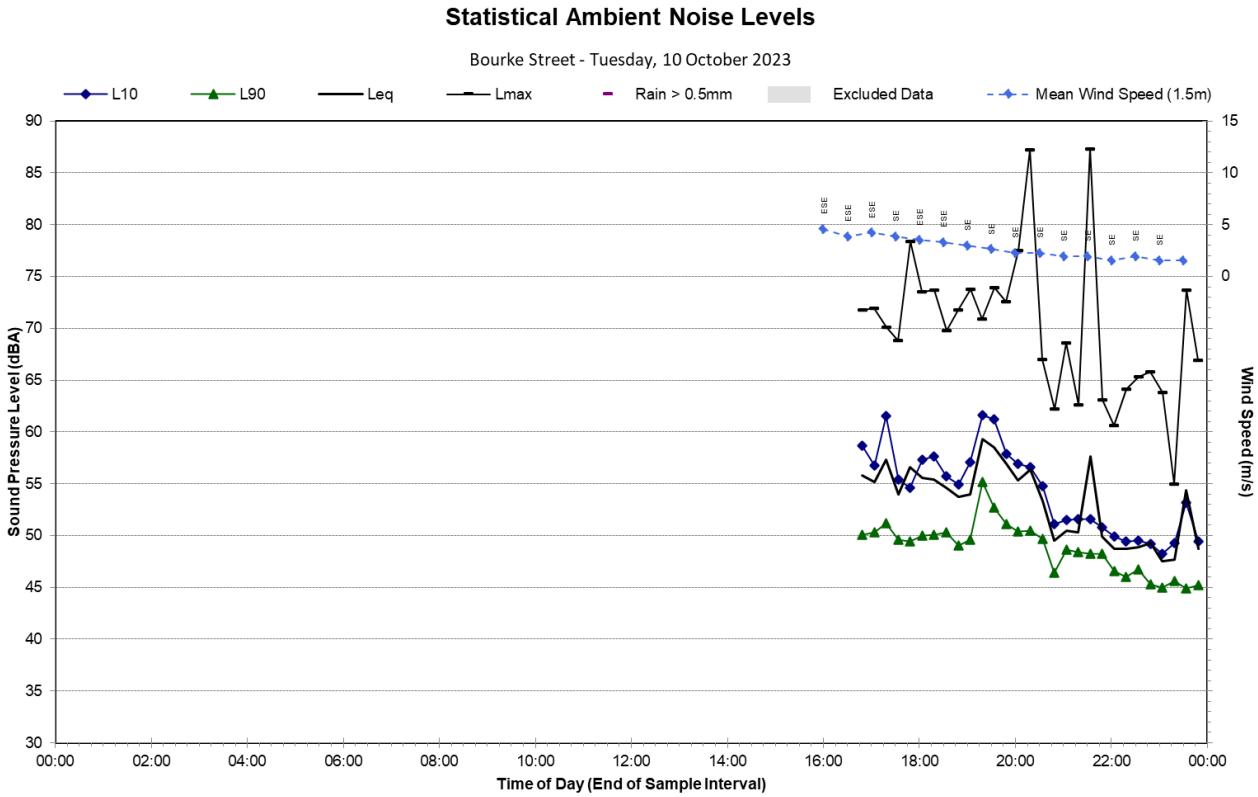
SLR Consulting Australia

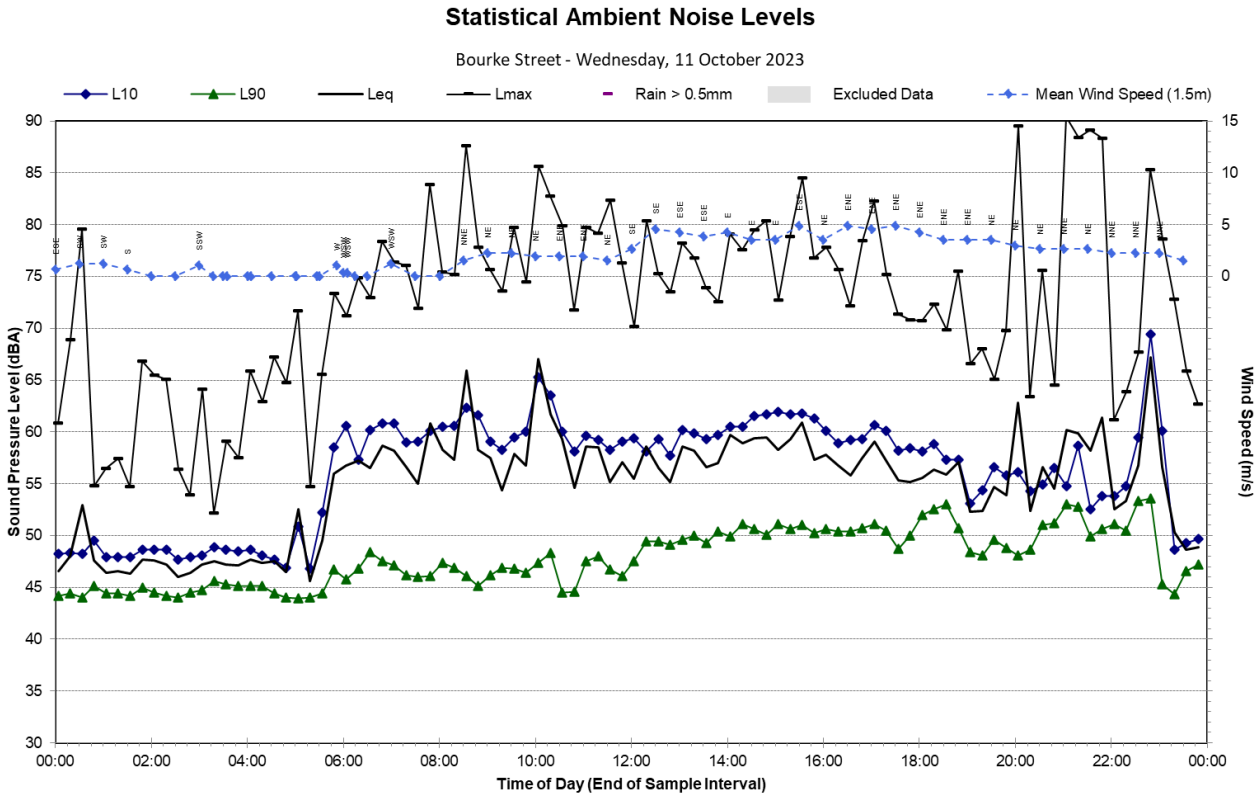
Martin Davenport
Principal Consultant – Nosie and Vibration
mdavenport@slrconsutling.coml

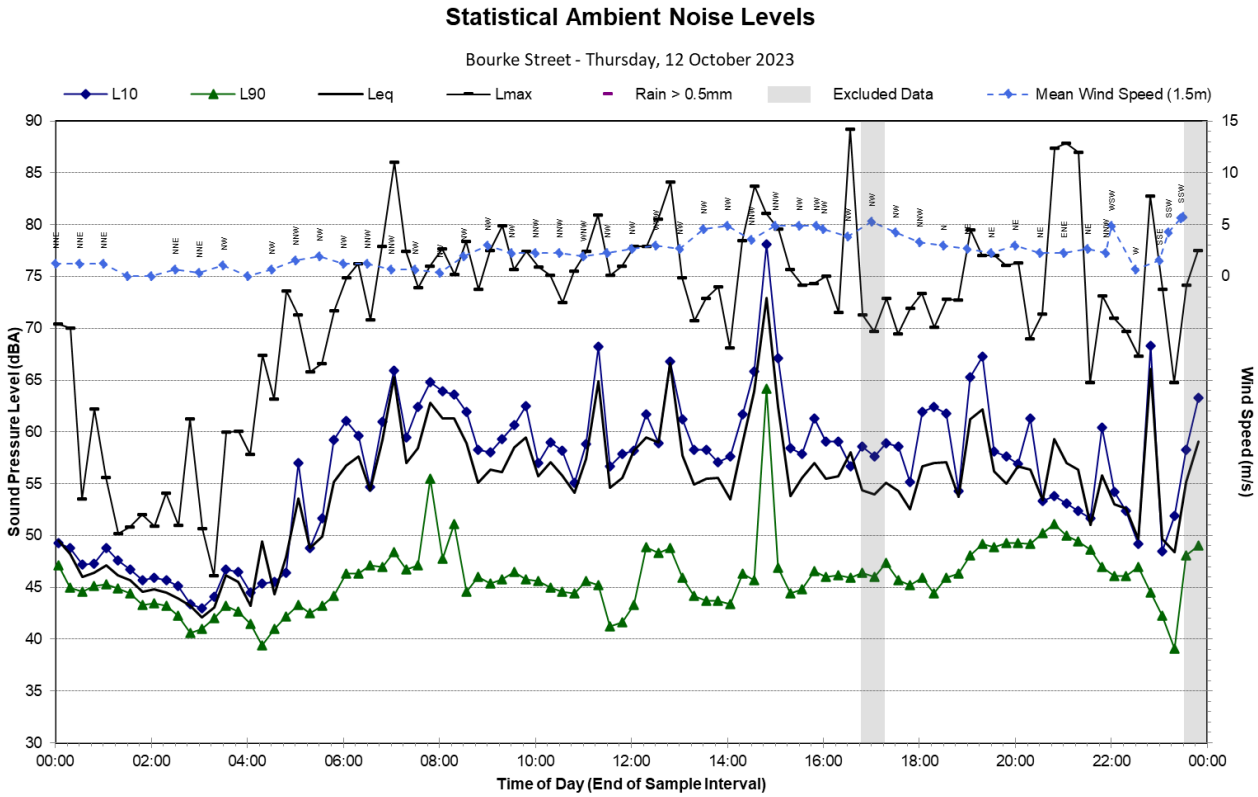
Checked/
Authorised by: MI

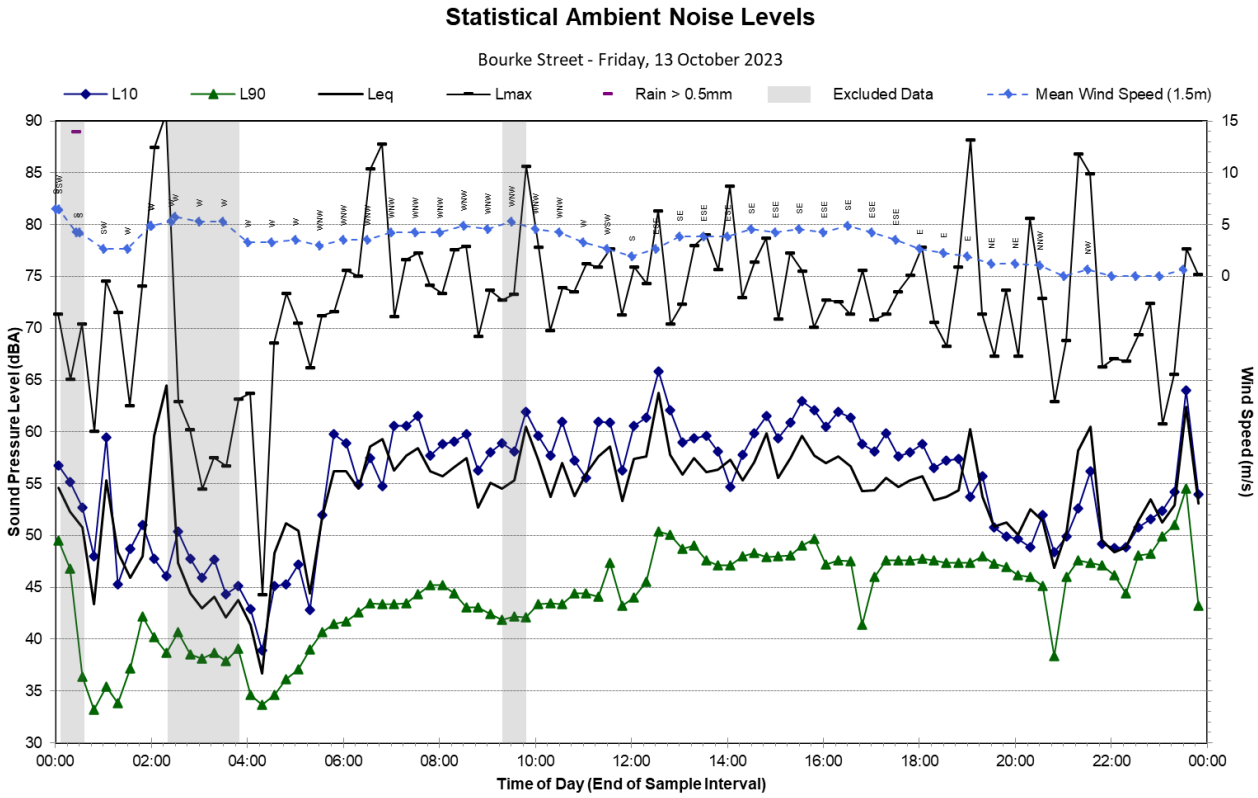
Attachments Appendix A – Statistical Ambient Noise Levels

Appendix A Statistical Ambient Noise Levels



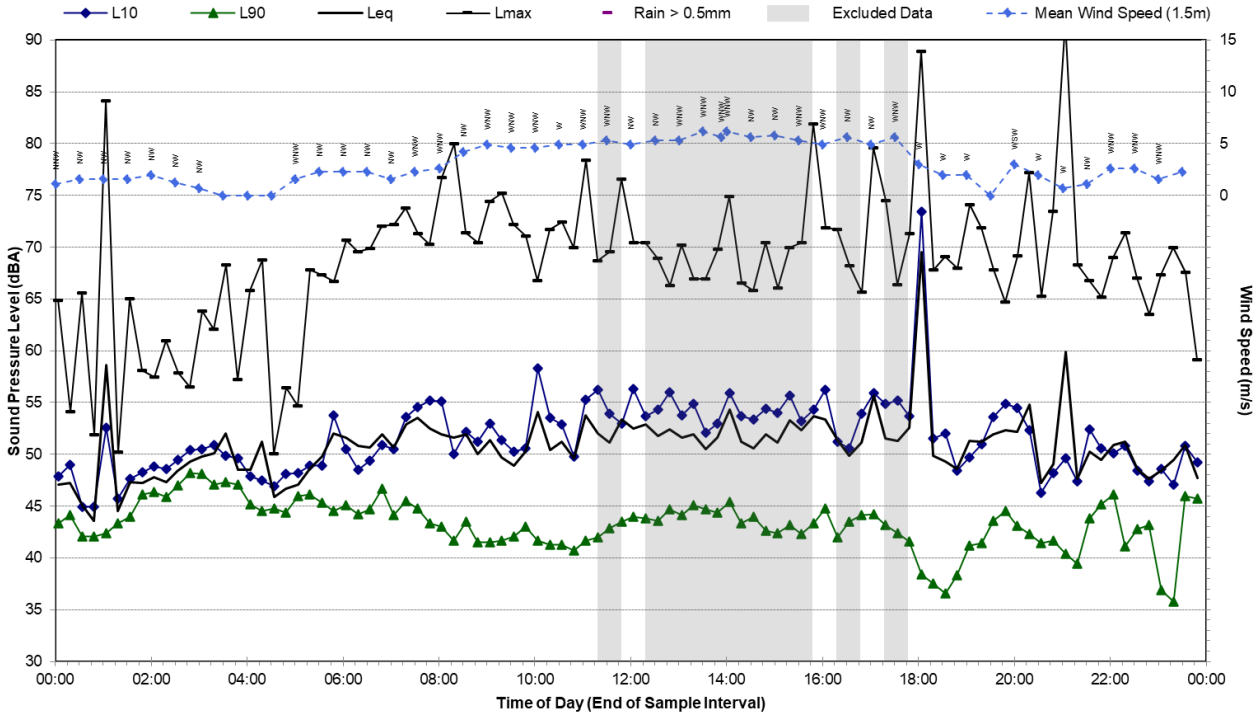



Statistical Ambient Noise Levels
Bourke Street - Thursday, 12 October 2023
L10
L90
Leq
Lmax
Rain > 0.5mm
Excluded Data
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
Bourke Street - Friday, 13 October 2023
L10
L90
Leq
Lmax
Rain > 0.5mm
Excluded Data
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)

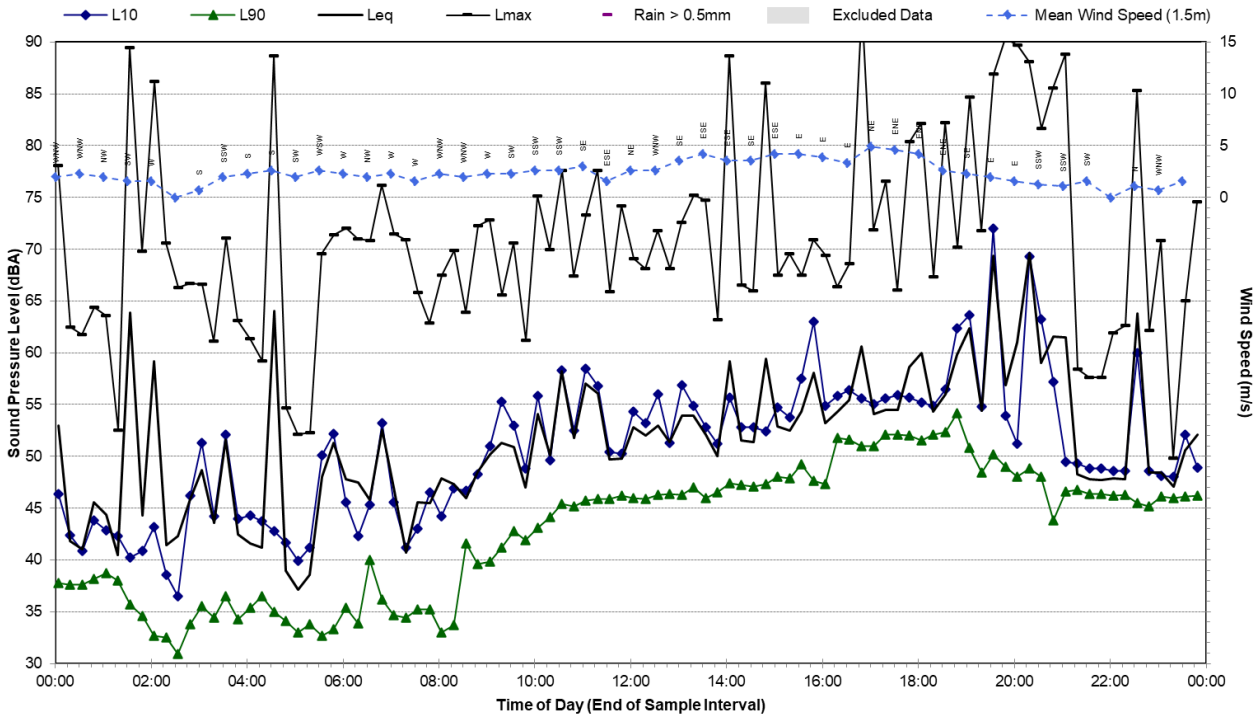
Statistical Ambient Noise Levels

Bourke Street - Saturday, 14 October 2023



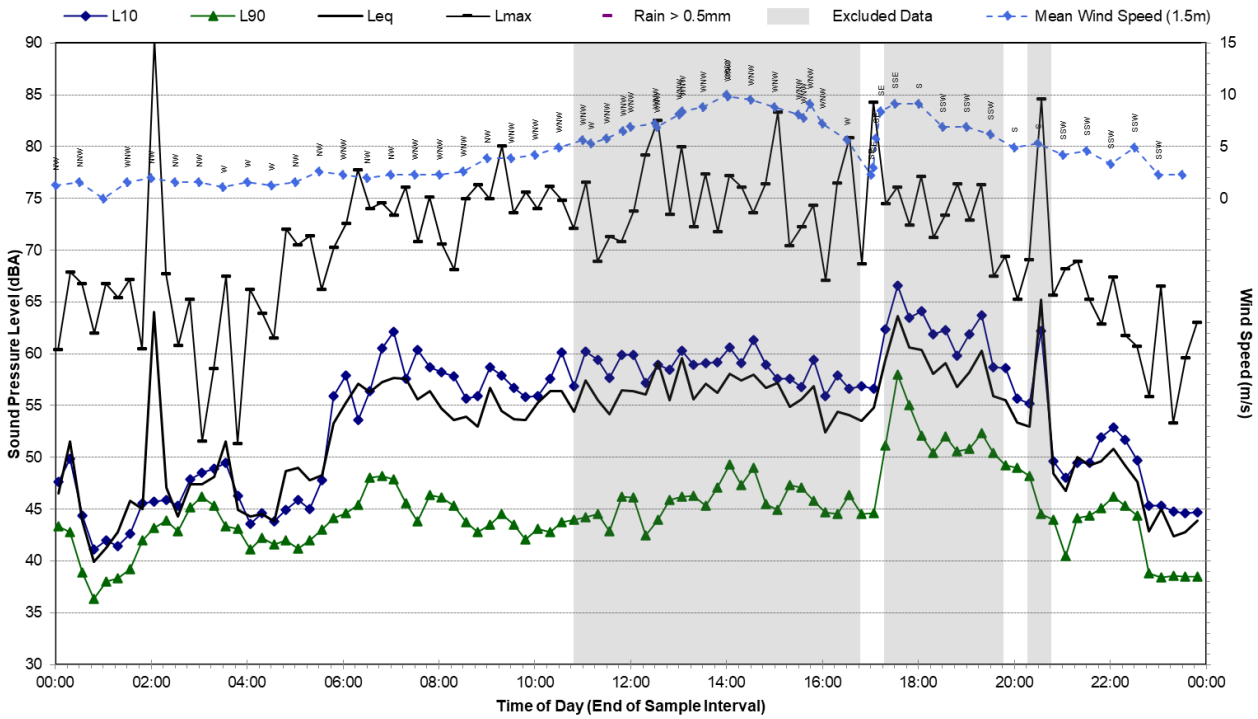
Statistical Ambient Noise Levels

Bourke Street - Sunday, 15 October 2023



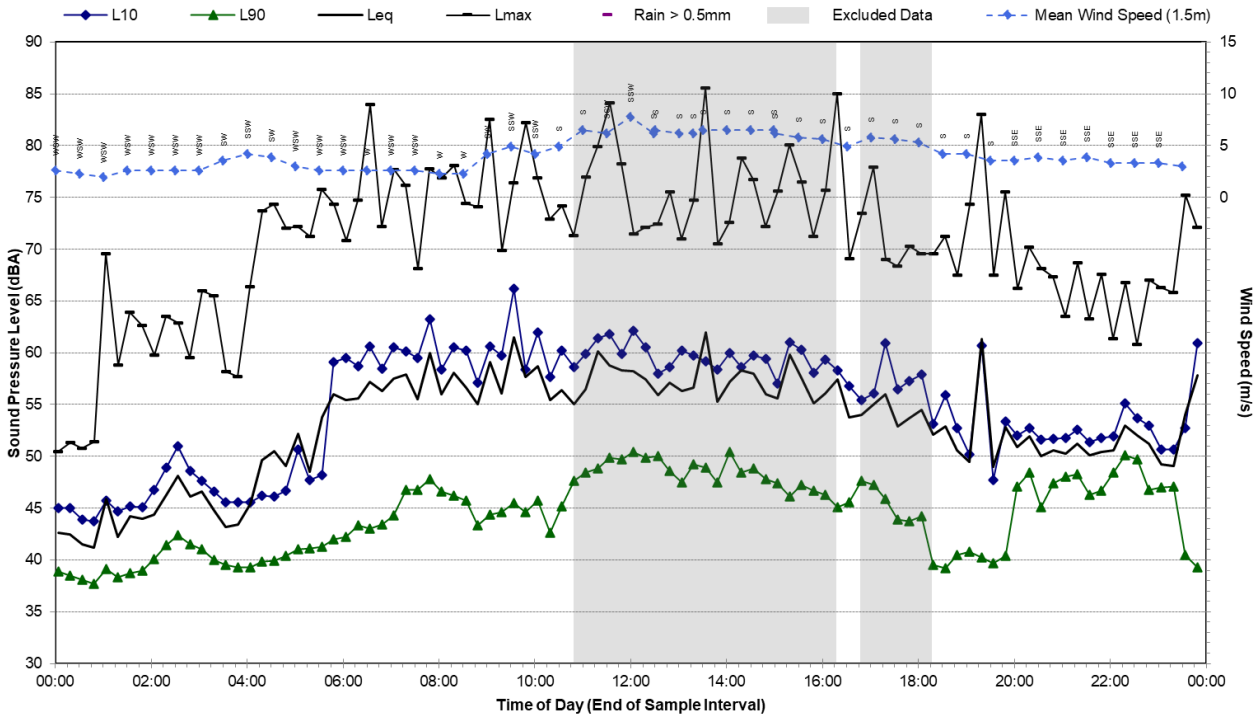
Statistical Ambient Noise Levels

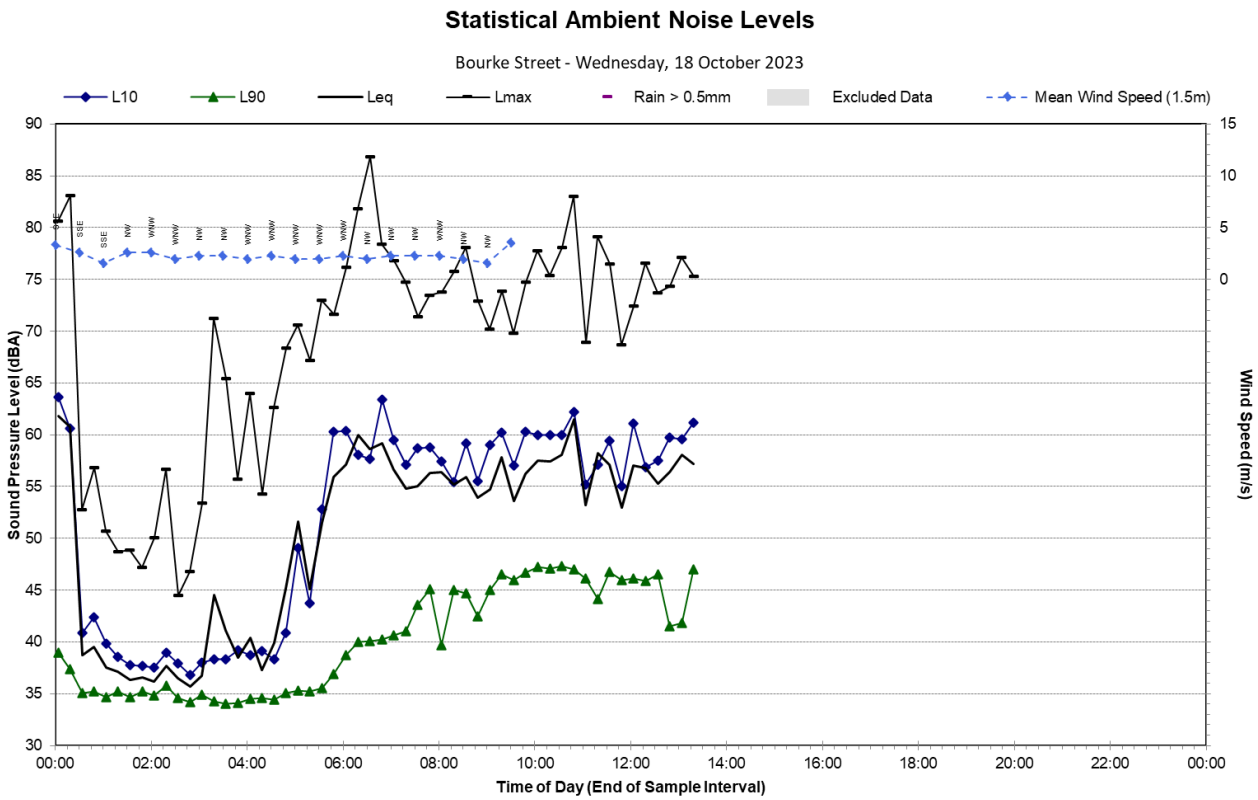
Bourke Street - Monday, 16 October 2023



Statistical Ambient Noise Levels

Bourke Street - Tuesday, 17 October 2023




Statistical Ambient Noise Levels
Bourke Street - Wednesday, 18 October 2023
L10
L90
Leq
Lmax
Rain > 0.5mm
Excluded Data
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)
90
85
80
75
70
65
60
55
50
45
40
35
30
15
10
5
0
00:00
02:00
04:00
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