RHA REPORT 30-1254-R1

Noise Assessment
Abalone Farm Pindimar

Prepared for

Australian Bounty Seafoods
PO Box 27
Anna Bay NSW 2316

21 May 2003

RICHARD HEGGIE
ASSOCIATES
ABN 29 001 584 612

Suite 3 Macquarie Court 180 Main Road Speers Point NSW 2284 Australia
Telephone 61 2 4946 3300 Facsimile 61 2 4946 3301 newcastle@heggies.com.au

Noise Assessment
Abalone Farm Pindimar

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Reference	Status	Date	Prepared	Checked	Authorised
30-1254R1	Revision 0	21 May 2003	KN	JL	JC

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1 INTRODUCTION

Richard Heggie Associates has been commissioned by Australian Bounty Seafoods (ABS) to conduct a noise assessment for a proposed abalone farm at Pindimar, NSW.

Broadly, the objectives of the noise assessment are to identify the potential noise impacts arising from activities and equipment during construction and operational phases of the farm.

The noise assessment has been prepared in accordance with Australian Standard 1055, 1997 *'Description and Measurement of Environmental Noise*" Parts 1, 2 and 3 and with reference to the EPA's Industrial Noise Policy and Environmental Noise Control Manual.

2 DESCRITION OF PROPOSED PROJECT

2.1 Proposed Development

Australian Bounty Seafoods (ABS) proposes to develop a series of land based tanks to farm abalone at a site in Lower Pindimar. It is similar in scope to local freshwater fish farms and has no intention of farming within natural waterways however the site does require access to marine water.

2.2 Plant and Equipment

Acoustically significant plant and equipment to be used on the site during construction and operational phases and sound power levels of these are presented in **Table 2.2.1**. Sound power levels were obtained from a RHA database of similar equipment. Details of the octave band levels and ENM inputs are given in **Appendix A**.

While pumps must be operated 24 hours a day, all other acoustically significant activities will be restricted to normal business hours.

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Table 2.2.1 Equipment Sound Power Levels

Equipment	Sound Power Levels
Construction	
Truck - materials delivery	84 dBA
Excavator	105 dBA
Bobcat	101 dBA
Concrete delivery	84 dBA
Operation	
Truck delivery	84 dBA
Water pumps	86 dBA
Electric Generator	113 dBA
Cooling System (Air conditioning units)	91 dBA

3 SITE DETAILS

The site will be situated in Lower Pindimar with access off Carruthers Avenue. This site is approximately 40 km North East of Newcastle, NSW. The land is currently zoned 1A Agricultural.

The nearest potentially affected residences to the proposed site are located in Cambage Street (see Location Map **Appendix B**).

4 EXISTING ACOUSTICAL ENVIRONMENT

4.1 Background Noise Survey

The objective of the background monitoring survey was to measure $L_{A90(15minute)}$ and $L_{Aeq(15minute)}$ noise levels at the nearest potentially affected receptors during daytime, evening and night-time periods to enable the intrusiveness and amenity criteria for the development to be determined.

Background noise levels were previously monitored at 41 Cunningham Street, Lower Pindimar during November 2000 for a project undertaken for Umwelt Australia. Permission to use this existing background data has been obtained by ABS from Umwelt. There are residential locations nearer to the proposed development however background noise levels monitored at this location are considered to be representative of the area.

ARL Type EL215 environmental noise loggers were used to monitor the ambient noise levels at the residential location. A Location Map showing the noise monitoring location is contained in **Appendix B**. An operator attended measurement was also taken in order to determine the variety of noise sources likely to affect and contribute to the noise survey.

Unattended Monitoring

Weather data for the survey period was obtained from the weather station located at the Williamtown Airport. Noise data during periods of any rainfall and/or wind speeds in excess of 5m/s (approximately 9knots) were discarded. A summary of the results of the background survey is given in **Table 4.1.1**. The ambient noise levels are presented in graphical format in **Appendix C**.

Table 4.1.1 Summary of Existing Ambient background Noise Levels

Location	Description	Background Noise Level L_{A90} Rating Background Level	Measured Existing L_{Aeq} Noise Level	Estimated Contribution from Industrial Noise Sources
41 Cunningham Street, Lower Pindimar	Daytime	33 dBA	50 dBA	<49 dBA
	Evening	32 dBA	49 dBA	<39 dBA
	Night	30 dBA	43 dBA	<34 dBA

Note: Daytime 7.00 am to 6.00 pm; Evening 6.00 pm to 10.00 pm; Night-time 10.00 pm to 7.00 am
On Sundays and Public Holidays, Daytime 8.00 am to 6.00 pm; Evening 6.00 pm to 10.00 pm;
Night-time 10.00 pm to 8.00 am

The L_{A90} represents the level exceeded for 90% of the interval period and is referred to as the average minimum or background noise level.

L_{Aeq} - The equivalent continuous noise level is defined as the level of noise equivalent to the energy average of noise levels occurring over a measurement period.

Attended Monitoring

Table 4.1.2 presents the findings of attended noise monitoring which indicate that noise within the area is dominated by natural sources with a suburban residential influence. There is no evidence to suggest any significant contribution from existing industrial sources.

Table 4.1.2 Attended Noise Monitoring Results

Location	Measurement Description	Primary Noise Descriptor (dBA re 20 µPa)					Description of Noise Emission and Typical Maximum Levels LAmax - dBA
		LAmax	LA1	LA10	LA90	LAeq	
41 Cunningham Street, Pindimar	Ambient	98	76	55	37	34	Birds up to 52 Children playing 44-45 Car 63, car door 98

5 EFFECTS OF METEOROLOGY ON NOISE LEVELS

Wind

Wind has the potential to increase noise at a receiver when it is light and stable and blows from the direction of the source of the noise. As the strength of the wind increases the noise produced by the wind will obscure noise from most industrial and transport sources.

Wind effects need to be considered when wind is a feature of the area under consideration. Where wind blows from the source to the receiver at speeds up to 3 m/s for more than 30% of the time in any season, then wind is considered to be a feature of the area and noise level predictions must be made under these conditions.

Weather data was obtained from the Bureau of Meteorology station at Williamtown for a period of 12 months. This data was analysed to determine the frequency of occurrence of winds up to speeds of 3 m/s for the daytime, evening and night time periods in each season. The results of this analysis are contained within **Table 5.1.1**, **Table 5.1.2** and **Table 5.1.3**.

Table 5.1.1 Seasonal Frequency of Occurrence Wind Speed Intervals - Daytime

Period	Calm	Wind Direction	0.5 to 1.5 m/s	1.5 to 3 m/s	0.5 to 3 m/s
Summer	7.6%	ESE±34° SE±34°	3.2% 2.7%	7.6% 7.3%	10.8% 10.0%
Autumn	20.3%	E±34° ESE±34°	4.2% 4.1%	5.0% 5.6%	9.2% 9.7%
Winter	5.9%	WNW±34° NW±34°	3.6% 3.2%	12.7% 11.1%	16.3% 14.3%
Spring	0.7%	NNW±34°	1.0%	7.3%	8.3%

Table 5.1.2 Seasonal Frequency of Occurrence Wind Speed Intervals - Evening

Period	Calm	Wind Direction	0.5 to 1.5 m/s	1.5 to 3 m/s	0.5 to 3 m/s
Summer	30.3%	ENE±34^o E±34^o ESE±34^o	14.1% 14.1% 12.5%	9.7% 7.0% 6.4%	23.8% 21.1% 18.9%
Autumn	50.9%	NE±34^o ENE±34^o	3.2% 5.6%	7.9% 6.5%	11.1% 12.1%
Winter	19.7%	NNE±34^o	5.3%	12.8%	18.1%
Spring	8.9%	NNE±34^o NE±34^o	2.1% 1.9%	17.2% 16.5%	19.3% 18.4%

Table 5.1.3 Seasonal Frequency of Occurrence Wind Speed Intervals - Night

Period	Calm	Wind Direction	0.5 to 1.5 m/s	1.5 to 3 m/s	0.5 to 3 m/s
Summer	33.5%	N±34^o NNE±34^o	6.3% 6.6%	7.0% 8.4%	13.3% 14.9%
Autumn	59.2%	W±34^o WNW±34^o NW±34^o	15.1% 17.1% 13.8%	2.0% 2.0% 2.0%	17.1% 19.1% 15.8%
Winter	19.5%	W±34^o WNW±34^o NW±34^o	4.1% 5.3% 5.5%	11.3% 14.6% 13.5%	15.5% 19.9% 19.0%
Spring	8.9%	WNW±34^o NW±34^o	3.7% 4.0%	14.3% 11.8%	18.0% 15.7%

Seasonal wind records indicate that winds of up to 3 m/s are not a feature of the area, as the frequency of such wind is below the 30% threshold. Modelling under prevailing wind was therefore not conducted as part of this investigation.

Temperature Inversion

Temperature inversions, when they occur, have the ability to increase noise levels by focusing sound waves. Temperature inversions occur predominantly at night during the winter months. For a temperature inversion to be a significant characteristic of the area it needs to occur for approximately 30% of the total time during winter, or about 2 nights per week.

The EPA Industrial Noise Policy states that temperature inversions need only be considered for the night noise assessment period (ie after 10.00 pm).

It is understood that the operational phase of the abalone farm will require 24 hour pump operation. It is for this reason that temperature inversion has been considered as part of this noise assessment.

6 IMPACT ASSESSMENT PROCEDURES

6.1 General Objectives

Residential Receiver

Responsibility for the control of noise emission in New South Wales is vested in Local Government and the EPA. The EPA released an Industrial Noise Policy in December 1999 that provides a framework and process for deriving noise criteria for consents and licences that will enable the EPA to regulate premises that are scheduled under the Protection of the Environment Operations Act, 1997.

The specific policy objectives are:

- to establish noise criteria that would protect the community from excessive intrusive noise and preserve amenity for specific land uses
- to use the criteria as the basis for deriving project specific noise levels
- to promote uniform methods to estimate and measure noise impacts, including a procedure for evaluating meteorological effects
- to outline a range of mitigation measures that could be used to minimise noise impacts
- to provide a formal process to guide the determination of feasible and reasonable noise limits for consents or licences that reconcile noise impacts with the economic, social and environmental considerations of industrial development
- to carry out functions relating to the prevention, minimisation and control of noise from premises scheduled under the Act.

Assessing Intrusiveness

For assessing intrusiveness, the background noise levels need to be measured. The intrusiveness criterion essentially means that the equivalent continuous noise level (L_{Aeq}) of the source should not be more than 5dB above the measured background level (L_{A90}).

Assessing Amenity

The amenity assessment is based on noise criteria specific to land use and associated activities. The criteria relate only to industrial-type noise and do not include road, rail or community noise. The existing noise level from industry is measured and if it approaches the criterion value, then noise levels from new industries need to be designed so that the cumulative effect does not produce noise levels that would significantly exceed the criterion. For high-traffic areas there is a separate amenity criterion.

An extract from the EPA Industrial Noise Policy that relates to the amenity criteria is given in **Table 6.1.1** and **Table 6.1.2**.

Table 6.1.1 Amenity Criteria - Recommended L_{Aeq} Noise Levels from Industrial Noise Sources

Type of Receiver	Indicative Noise Amenity Area	Time of Day	Recommended L_{Aeq} Noise Level (dBA)	
			Acceptable	Recommended Maximum
Residence	Rural	Day	50	55
		Evening	45	50
		Night	40	45
	Suburban	Day	55	60
		Evening	45	50
		Night	40	45
	Urban	Day	60	65
		Evening	50	55
		Night	45	50
	Urban/Industrial Interface (for existing situations only)	Day	65	70
		Evening	55	60
		Night	50	55
School classrooms - internal	All	Noisiest 1-hour period when in use	35	40
Hospital ward				
- internal	All	Noisiest 1-hour period	35	40
- external	All	Noisiest 1-hour period	50	55
Place of worship - internal	All	When in use	40	45
Area specifically reserved for passive recreation (eg National Park)	All	When in use	50	55
Active recreation area (eg school playground, golf course)	All	When in use	55	60
Commercial premises	All	When in use	65	70
Industrial premises	All	When in use	70	75

Notes For Monday to Saturday, Daytime 7.00 am - 6.00 pm; Evening 6.00 pm - 10.00 pm; Night-time 10.00 pm - 7.00 am.

On Sundays and Public Holidays, Daytime 8.00 am - 6.00 pm; Evening 6.00 pm - 10.00 pm; Night-time 10.00 pm - 8.00 am.

The L_{Aeq} index corresponds to the level of noise equivalent to the energy average of noise levels occurring over a measurement period.

Table 6.1.2 Modification to Acceptable Noise Level (ANL)* to Account for Existing Levels of Industrial Noise

Total Existing LAeq noise level from Industrial Noise Sources	**Maximum LAeq Noise Level for Noise from New Sources Alone, dBA**
≥ Acceptable noise level plus 2 dBA	If existing noise level is *likely to decrease* in future acceptable noise level minus 10 dBA If existing noise level is *unlikely to decrease* in future existing noise level minus 10 dBA
Acceptable noise level plus 1 dBA	Acceptable noise level minus 8 dBA
Acceptable noise level	Acceptable noise level minus 8 dBA
Acceptable noise level minus 1 dBA	Acceptable noise level minus 6 dBA
Acceptable noise level minus 2 dBA	Acceptable noise level minus 4 dBA
Acceptable noise level minus 3 dBA	Acceptable noise level minus 3 dBA
Acceptable noise level minus 4 dBA	Acceptable noise level minus 2 dBA
Acceptable noise level minus 5 dBA	Acceptable noise level minus 2 dBA
Acceptable noise level minus 6 dBA	Acceptable noise level minus 1 dBA
< Acceptable noise level minus 6 dBA	Acceptable noise level

* ANL = recommended acceptable L_{Aeq} noise level for the specific receiver, area and time of day from **Table 6.1.1**.

Assessing Sleep Disturbance

To avoid sleep disturbance the EPA recommends that the L_{A1} of the noise source under consideration should not exceed the background noise level(L_{A90}) by more than 15 dBA when measured outside the bedroom window of the receiver during the night-time hours (10.00 pm to 7.00 am).

6.2 Noise Emission Design Goals

The noise emission design goals for operation of the proposed development have been established with reference to the EPA Industrial Noise Policy outlined in **Section 6.1**.

The acoustical environment typifies a rural environment, ie the acoustical environment is dominated by natural sounds and shows little contribution from road traffic. Therefore, the residences in the general area have been assessed under the "rural" receiver type.

The resulting design goals are given in **Table 6.2.1**.

Table 6.2.1 Noise Emission Design Goals

Location	Description	Intrusiveness Criterion $L_{Aeq(15minute)}$	Amenity Criterion L_{Aeq}
41 Cunningham Street, Pindimar	Daytime	38 dBA	50 dBA
	Evening	37 dBA	45 dBA
	Night	35 dBA	40 dBA

Note: Daytime 7.00 am to 6.00 pm; Evening 6.00 pm to 10.00 pm; Night-time 10.00 pm to 7.00 am.
On Sundays and Public Holidays, Daytime 8.00 am to 6.00 pm; Evening 6.00 pm to 10.00 pm; Night-time 10.00 pm to 8.00 am.

The L_{A90} represents the level exceeded for 90% of the interval period and is referred to as the average minimum or background noise level.

L_{Aeq} - The equivalent continuous noise level is defined as the level of noise equivalent to the energy average of noise levels occurring over a measurement period.

6.3 Traffic Noise Design Goals

The Environment Protection Authority released the *"Environmental Criteria for Road Traffic Noise"* in May 1999. The policy sets out noise criteria applicable to different road classifications for the purpose of defining traffic noise impacts.

Cambage Street and Challis Avenue will be the principal access roads to the site, from which all other activities will occur. These will be assessed under criteria for a "local road", as per Section 2 of the EPA NSW Environmental Criteria for Road Traffic Noise (refer to **Table 6.3.1**).

Table 6.3.1 EPA Environmental Criteria for Road Traffic Noise

Type of Development	Descriptor	Traffic Noise Goal
13. Land use developments with the potential to create additional traffic on a local road	$L_{Aeq(1hour)}$ daytime	55 dBA*
	$L_{Aeq(1hour)}$ night-time	50 dBA*

* In all cases (where criteria are already exceeded), traffic arising from the development should not lead to an increase in existing noise levels of more than 2 dBA.

6.4 NSW EPA Construction Noise Criteria

The EPA NSW "Environmental Noise Control Manual (ENCM)", Chapter 171, sets out noise criteria applicable to construction site noise for the purpose of defining intrusive noise impacts. Based upon this document the project specific noise limits outlined in **Table 6.4.1** will apply to the proposed development.

Table 6.4.1 Construction Site Noise Control Guidelines

Construction Period	Acceptable L_{A10} Noise Level[1]
4 weeks and under	Background L_{A90} plus 20 dBA
4 weeks to 26 weeks	Background L_{A90} plus 10 dBA
Greater Than 26 Weeks	Background L_{A90} plus 5 dBA

1. Applicable between the hours of 7.00 am and 6.00 pm Monday to Friday, and 8.00 am to 1.00 pm Saturdays. For all other times construction noise must be inaudible at the receiver. No construction work is to take place on Sundays or Public Holidays.

Background noise monitoring undertaken during November 2000 indicates that the daytime L_{A90} background noise level at the nearest potentially affected residential location was 33 dBA, inferring the project specific noise levels presented in **Table 6.4.2**.

Table 6.4.2 Project Specific Construction Noise Goals

Construction Period	L_{A90} Rating Background Level (RBL)	Project Specific L_{A10} Noise Design Goal[1]
4 weeks and under	33 dBA	53 dBA
4 weeks to 26 weeks	33 dBA	43 dBA
Greater than 26 Weeks	33 dBA	38 dBA

1. Applicable between the hours of 7.00 am and 6.00 pm Monday to Friday, and 8.00 am to 1.00 pm Saturdays. For all other times construction noise must be inaudible at the receiver. No construction work is to take place on Sundays or Public Holidays.

7 ASSESSMENT OF NOISE IMPACTS

7.1 Noise Modelling

A computer model was used to predict the noise emissions from the future development of the ABS site. The Environmental Noise Model (ENM) used has been produced in conjunction with the EPA. The model used local topographical data, together with the noise source data, ground cover, shielding by barriers and/or adjacent buildings and atmospheric information to predict noise levels.

Weather conditions under which noise level predictions were made are given in **Table 7.1.1**.

Table 7.1.1 Weather conditions for noise predictions

	Temperature	Humidity	Wind speed	Wind direction	Temperature gradient
Calm	20°C	65%	N/A	N/A	N/A
Temperature Inversion	10°C	90%	N/A	N/A	3°C/100m

Other assumptions made in the modelling of the proposed development include:

- Water pumps are in operation 24 hours a day.
- All other acoustically significant plant and equipment to be used during the operational phase are restricted to the daytime period (ie between the hours of 7.00 am and 6.00 pm Monday to Saturday and 8.00 am to 6.00 pm Sundays.)
- Acoustically significant plant and equipment to be used during the construction phase include a front end loader, excavator, bobcat and truck deliveries of construction materials and concrete. Operation of this equipment is restricted to between the hours of 8.00 am and 5.00 pm weekdays.

7.2 Operational Noise Level Predictions and Assessment

The L_{Aeq} noise emission levels predicted at the potentially worst affected residence surrounding the site for the operation of the proposed abalone farm are presented in **Table 7.2.1**.

Table 7.2.1 Predicted Operational Noise Levels

Location	Period	Predicted Abalone Farm Noise Level $L_{Aeq(15minute)}$		Design Goal L_{Aeq}
		Calm Weather	Temperature inversion	
Cambage Street, Lower Pindimar	**Day** 7.00 am to 6.00 pm Monday to Saturday, 8.00 am to 6.00 pm Sunday	37 dBA	N/A	38 dBA
	Evening 6.00 pm to 10.00 pm 7 days a week	<20 dBA	N/A	37 dBA
	Night 10.00 pm to 7.00 am Monday to Saturday, 10.00 pm to 8.00 am Sunday	<20 dBA	20 dBA	35 dBA

The results given in **Table 7.2.1** show that:

- Under calm weather conditions the noise generated by the proposed abalone farm is predicted to meet the design goals for operation during all periods at the nearest potentially affected residential location.
- Under temperature inversion the noise generated by the proposed abalone farm is predicted to meet the design goals for operation during night-time at the nearest potentially affected residential location.

7.3 Road Traffic Noise Assessment

Predictions regarding likely traffic generation due to both the construction and operational phases of the proposed abalone farm are given in **Table 7.3.1**.

Table 7.3.1 Likely Average Vehicle Movements

Phase of Development	Total Average Vehicle Movements[1]
Construction	Truck deliveries - 30 per year
Operation	Light truck delivery of food - 2 per fortnight Employees cars - 12 per day Delivery to market - 2 (on a regular basis) Visitors - 100 per year Garbage collection - 2 per week

1. Vehicle movements = vehicle trip x 2, which represents a return journey for each vehicle.

To accurately model the likely noise generation due to the development a worst case scenario was predicted. The worst case will occur during the operational phase of development and was based upon six employee's cars, one delivery of food, one delivery to market, one garbage collection and two visitors. This will represent a "peak hour", likely to occur in the morning or afternoon at the start or end of a shift. For night-time (6.00 am to 7.00 am) only noise from employees' cars has been assessed as all deliveries, and waste disposal will be scheduled to occur after 7.00 am and before 10.00 pm. The residential dwellings are assumed to have a minimum setback from the road of 5 metres. Average road speed of vehicles was assumed to be 50 km/h. **Table 7.3.2** contains the results of this prediction.

Table 7.3.2 Likely Vehicle Noise Contribution

Phase of Development	Period	Likely Vehicle Noise Contribution ($L_{Aeq(1hour)}$)	Traffic Noise Goal
Operation	Daytime (7.00 am to 10.00 pm)	39 dBA	55 dBA
	Night-time (10.00 pm to 7.00 am)	32 dBA	50 dBA

Based upon this assessment "peak hour" traffic noise generated by the development will be below the EPA design goal for both daytime and night-time periods.

7.4 Construction Noise Level Predictions and Assessment

Construction of the abalone farm including ponds, dams, tanks, sheds, administration and other facilities will be staged over a three year period. Stages of construction are presented in **Table 7.4.1**.

Table 7.4.1 Stages of construction

Stage	Description
End of Year 1	- Install sediment and erosion controls and site preparation - Road improvement - Construction of small hatchery retention ponds, headers, broodstock conditioning and spawning facilities and administration complex - Provision of utilities - Lay inlet pipes and construct pumping facilities - Construction of nursery system and first growout house
End of Year 2	- Construction of large retention pond - Construction of second growout house
End of Year 3	- Construction of third growout house - Construction of additional large retention pond (if required)

In modelling the construction phase of the development it was assumed that acoustically significant plant and equipment to be used during this phase will include an excavator, bobcat, and truck deliveries of construction materials. Under this assumption, the L_{A10} noise level was predicted at the potentially worst affected residence surrounding the site for the construction of the proposed abalone farm. Results of this prediction are given in **Table 7.4.2**.

Table 7.4.2 Predicted Construction Noise

Location	Period	Predicted Construction L_{A10} Noise Level				Construction Period	Project Specific L_{A10} Noise Design Goal
		Excavator	Bobcat	Deliveries	Total		
Cambage Street	8.00am to 5.00pm Weekdays[1]	40 dBA	39 dBA	21 dBA	42 dBA	< 4 weeks	53 dBA
						4 - 26 weeks	43 dBA
						> 26 weeks	38 dBA

[1] Construction will not occur outside these hours.

The total L_{A10} noise level predicted for the construction phase is below the recommended design goal for a construction period of between four and 26 weeks. It is recommended that actual construction time for the proposed development (ie total cumulative time that acoustically significant plant and equipment are used on site for construction purposes) be less than 26 weeks.

8 CONCLUSION

This report presents the results and findings of a noise assessment for construction and operation of a proposed abalone farm at Lower Pindimar, NSW.

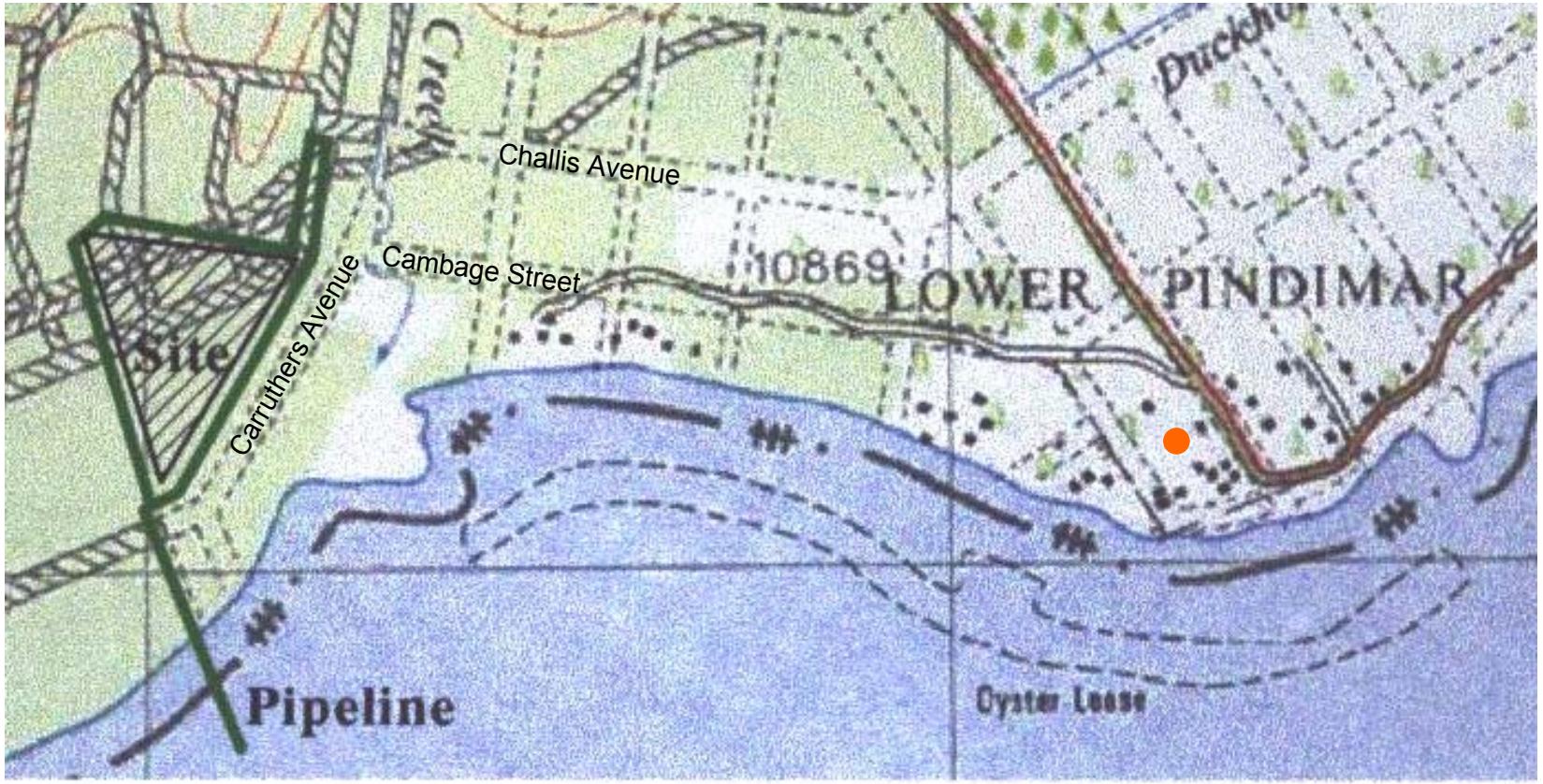
Operational noise levels predicted under both calm and prevailing (temperature inversion) weather conditions are predicted to meet the project specific design goals during all periods at the nearest potentially affected residential location.

Road traffic noise levels are predicted to be below the EPA design goals for both day and night time periods for both construction and operation of the development.

Noise levels during construction of the proposed development are predicted to meet the NSW EPA construction noise criteria for a construction period of between four and 26 weeks.

Job Number	30-1254
Job Description	Noise Assessment, Abalone Farm, Pindimar
Project Manager	KN

Source No	Equipment Description	Octave Band Centre Frequency (Hz) - dBL re 1pW										dB	ENM (m)		Ground	Elevation
		31.5	63	125	250	500	1k	2k	4k	8k	16K	Overall	East	North	RL(m)	RL(m)
Operation																
1	Pumpstation pump 1	75	75	76	78	79	80	81	79	72	72	88 dB	1013	114	0	0.5
2	Pumpstation pump 2	75	75	76	78	79	80	81	79	72	72	88 dB	1013	114	0	0.5
3	Pond 1	75	75	76	78	79	80	81	79	72	72	88 dB	1016	274	0	0.5
4	Pond 2	75	75	76	78	79	80	81	79	72	72	88 dB	1037	248	0	0.5
5	Growout	75	75	76	78	79	80	81	79	72	72	88 dB	1050	344	0	0.5
6	Juvenlie Culture	75	75	76	78	79	80	81	79	72	72	88 dB	1135	394	0	0.5
7	Shipment 1	75	75	76	78	79	80	81	79	72	72	88 dB	1123	398	0	0.5
8	Shipment 2	75	75	76	78	79	80	81	79	72	72	88 dB	1144	383	0	0.5
9	Generator	103	105	111	110	110	109	106	101	95	84	117 dB	1005	339	0	0.5
10	Air Conditioning Unit	94	94	88	91	89	84	85	78	70	70	99 dB	1160	389	0	1.5
11	Delivery truck	90	92	81	77	79	81	78	70	62	62	95 dB	1184	423	0	1
Construction																
12	Excavator	103	104	107	103	104	99	94	86	76	76	112 dB	1122	363	0	1
13	Bobcat	108	111	106	98	96	97	94	86	82	82	114 dB	1122	363	0	1
14	Truck delivery	90	92	81	77	79	81	78	70	62	62	95 dB	1122	363	0	1
15	Truck delivery	90	92	81	77	79	81	78	70	62	62	95 dB	1122	363	0	1



Noise monitoring location

Appendix B

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Location Diagram

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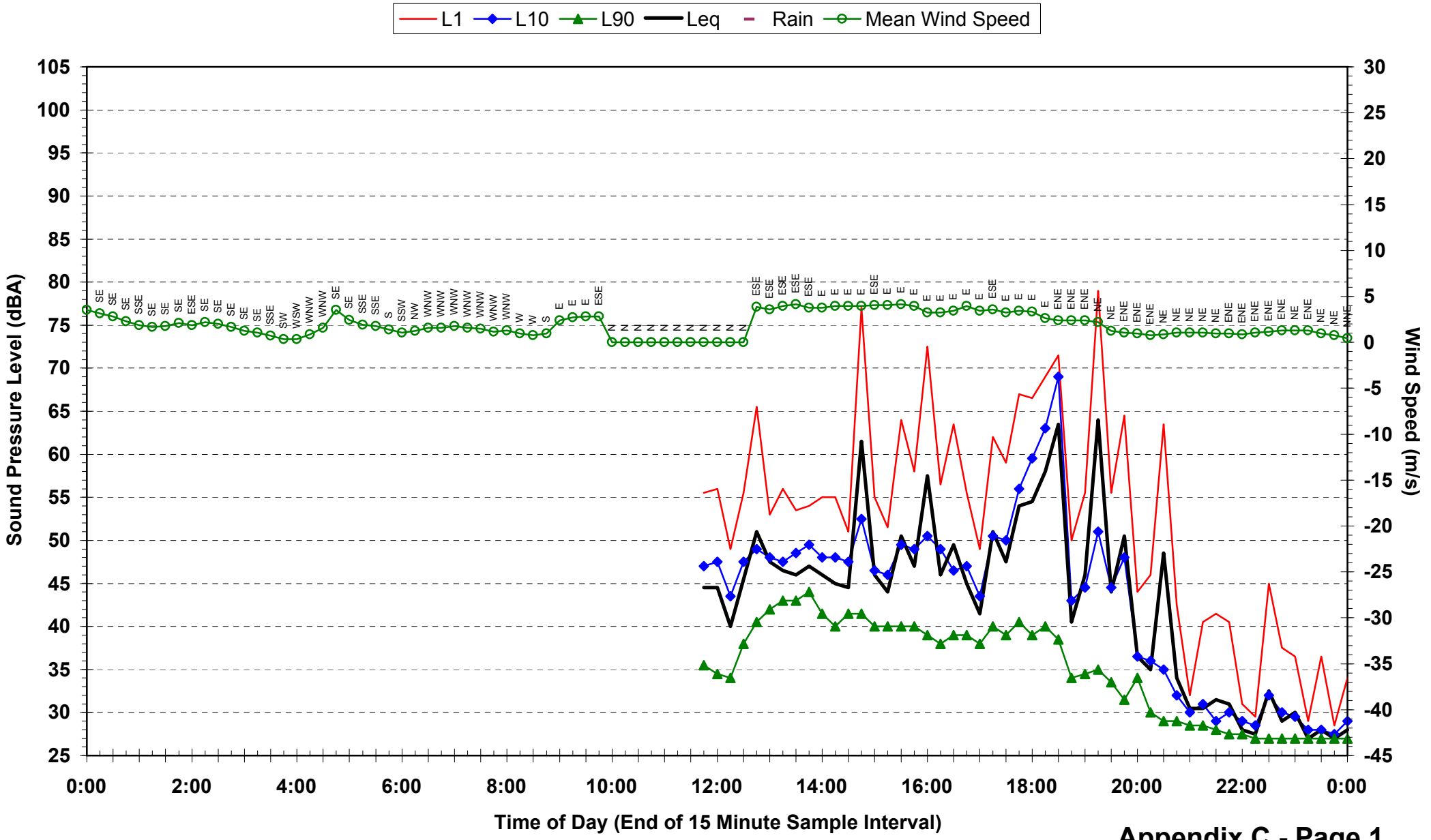
Statistical Ambient Noise Levels
41 Cunningham Street, Pindimar - Wednesday 8 November 2000



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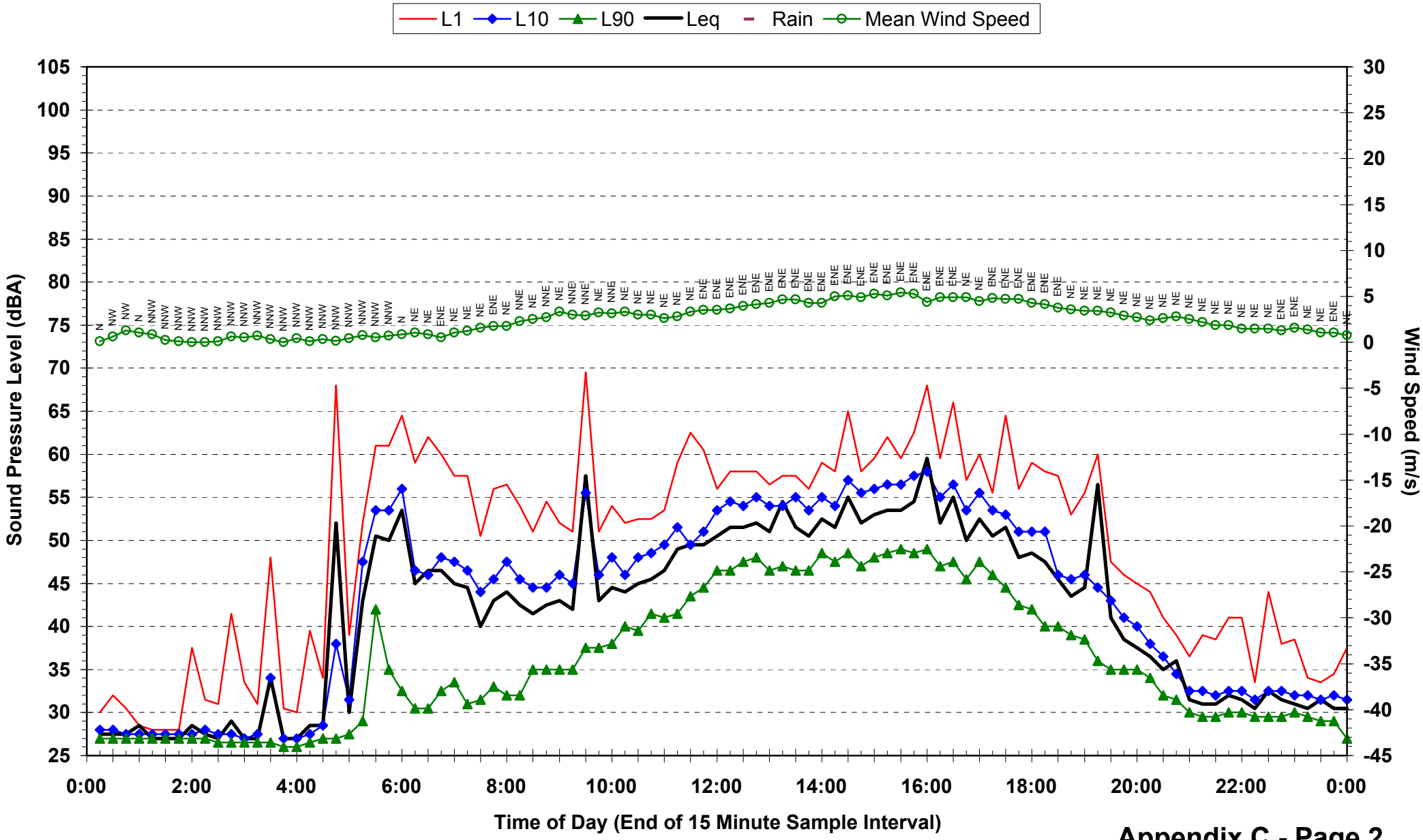
Statistical Ambient Noise Levels
41 Cunningham Street, Pindimar - Thursday 9 November 2000



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Jerremy Lofts**\30-1069 Port Stephens pearl Oyster\PSTV4.xls
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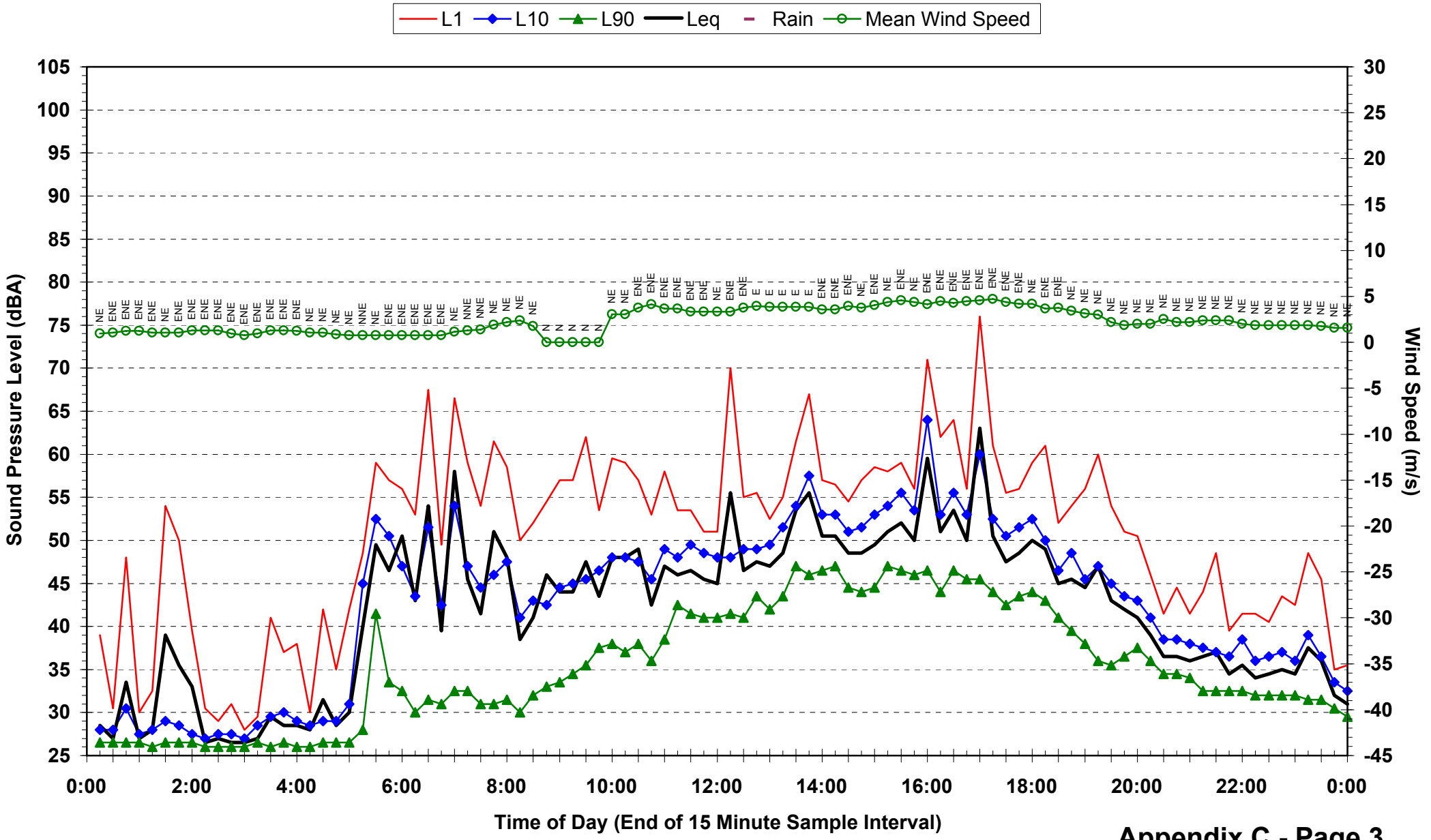
Statistical Ambient Noise Levels
41 Cunningham Street, Pindimar - Friday 10 November 2000



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Statistical Noise Levels
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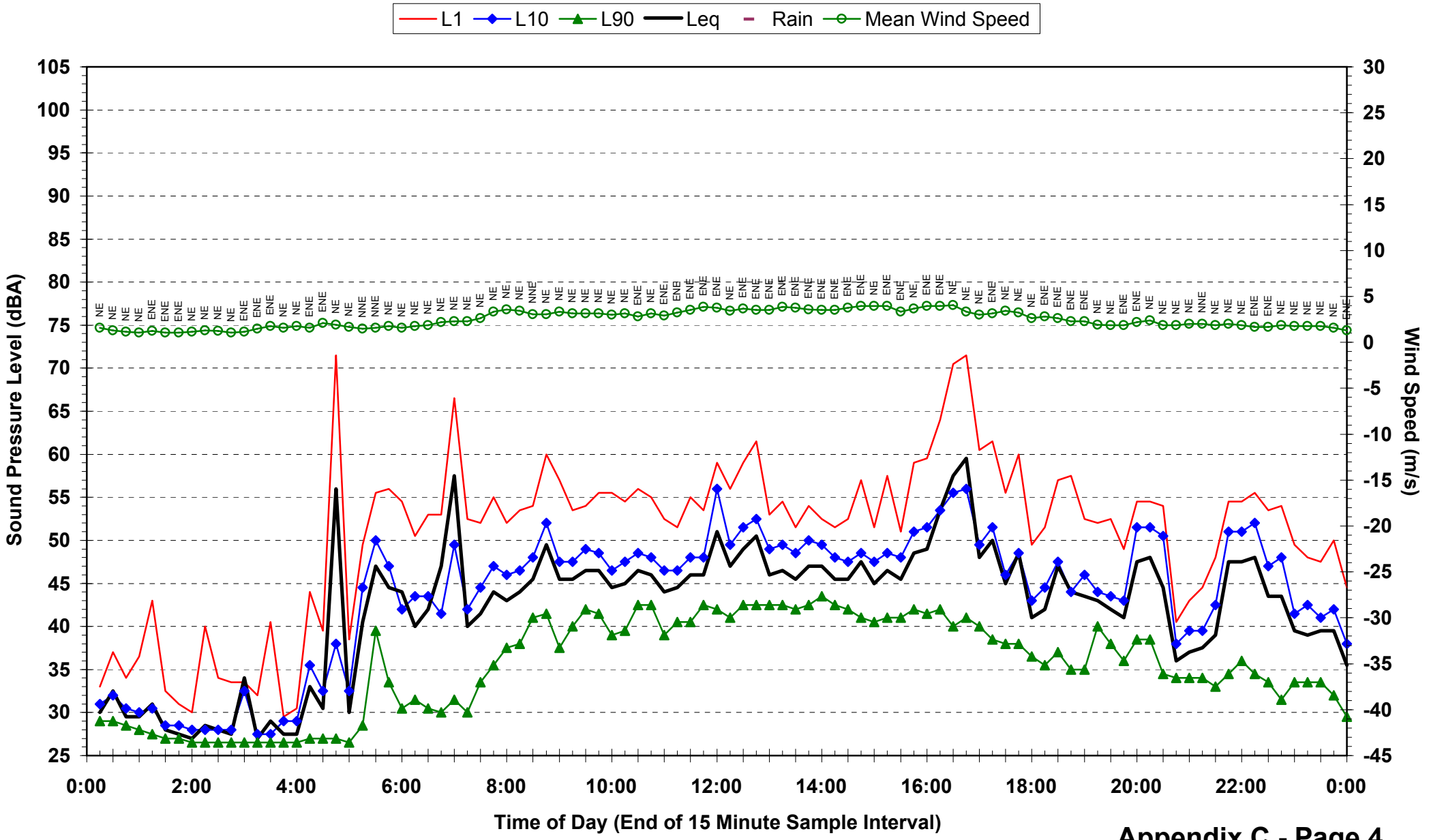
Statistical Ambient Noise Levels
41 Cunningham Street, Pindimar - Saturday 11 November 2000



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Statistical Noise Levels
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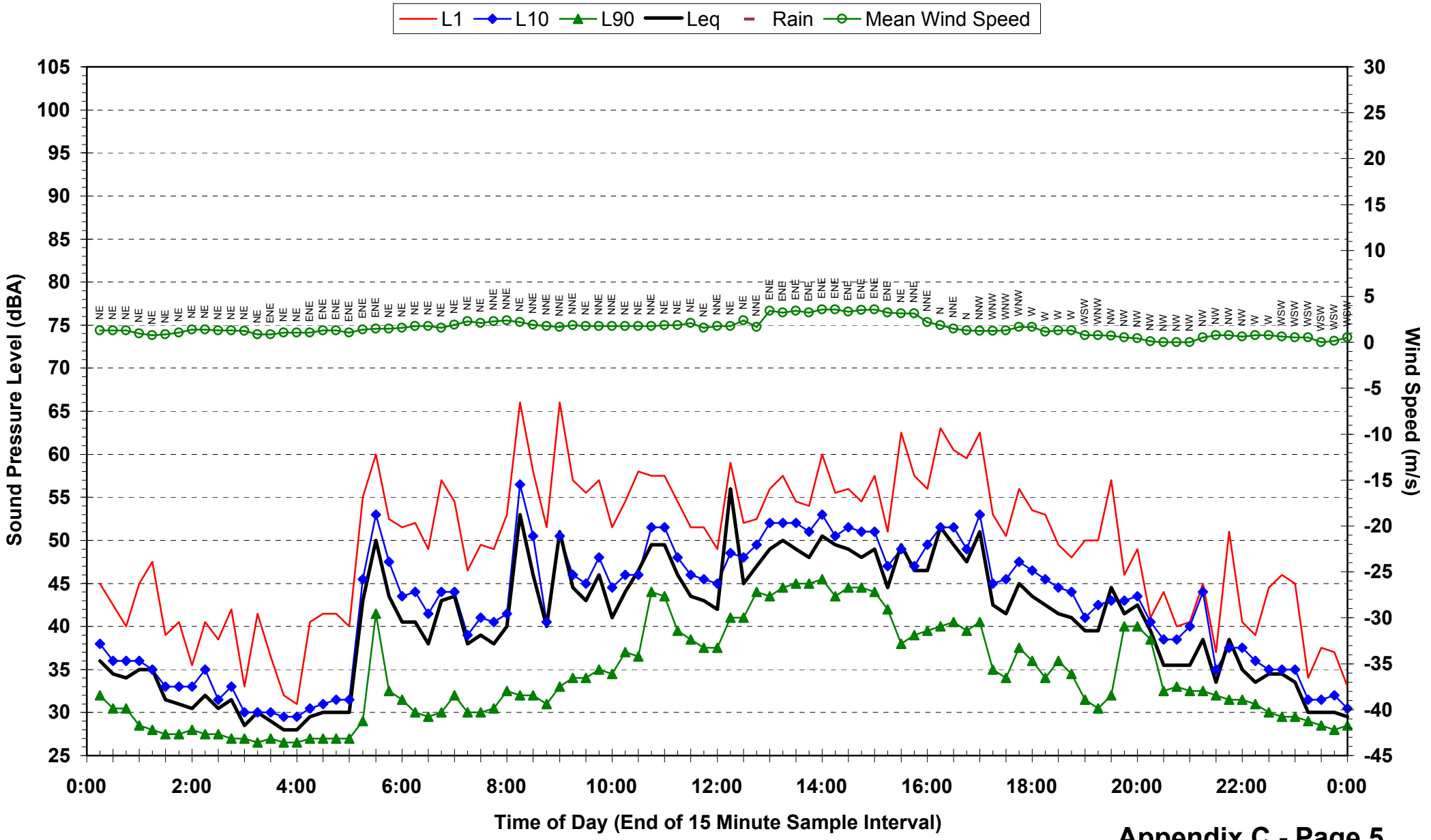
Statistical Ambient Noise Levels
41 Cunningham Street, Pindimar - Sunday 12 November 2000



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Statistical Noise Levels
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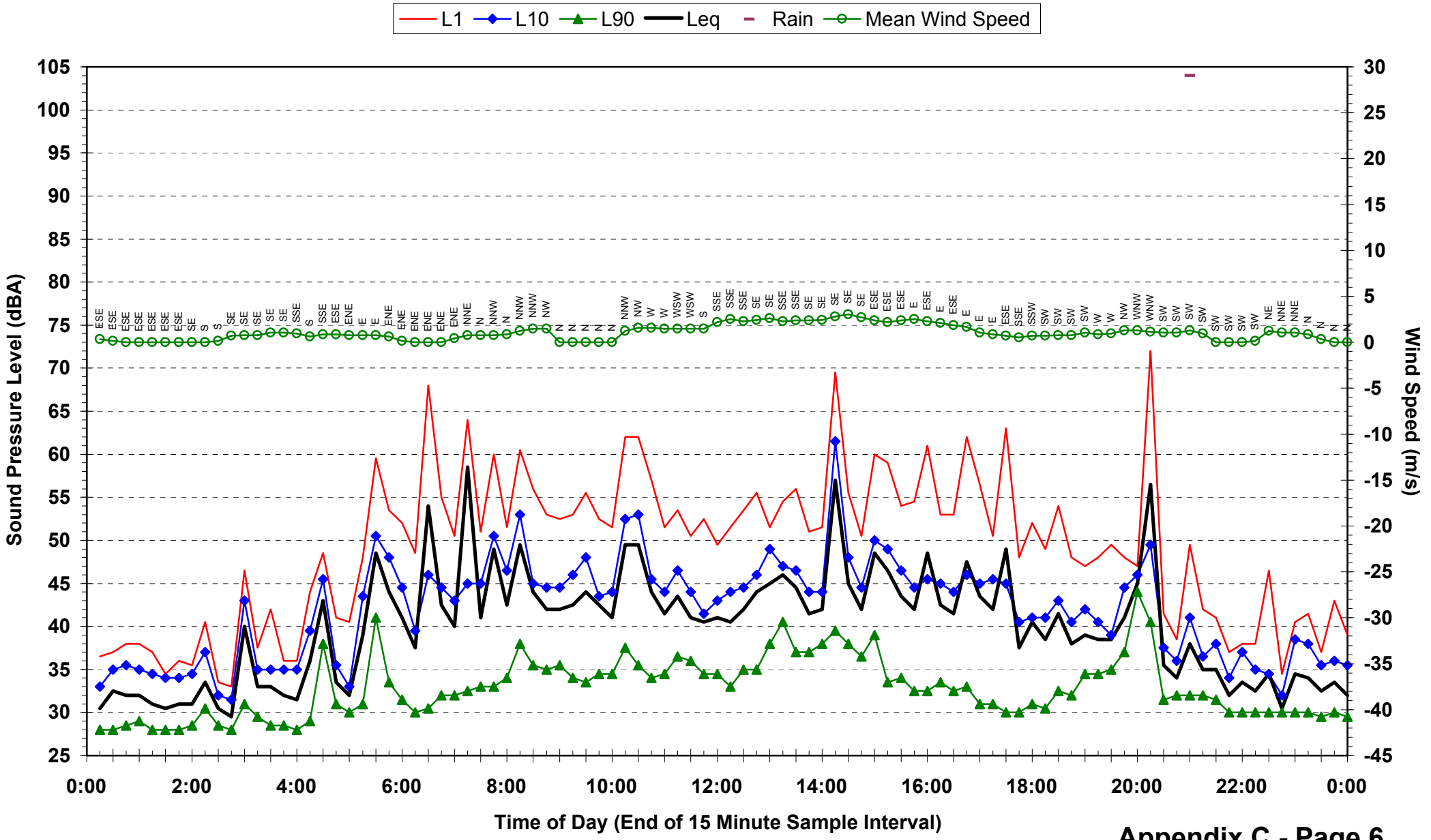
Statistical Ambient Noise Levels
41 Cunningham Street, Pindimar - Monday 13 November 2000



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Statistical Noise Levels
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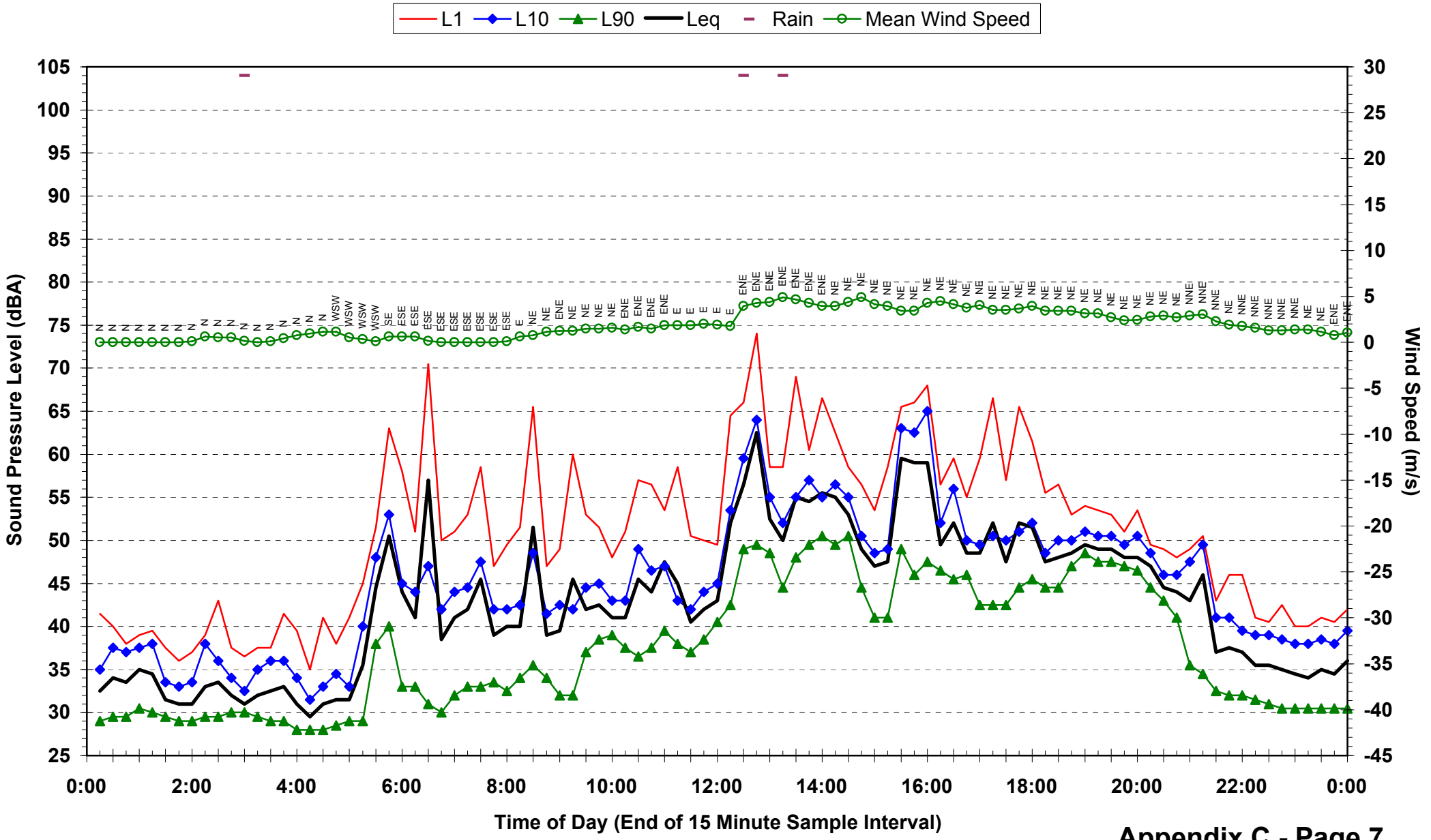
Statistical Ambient Noise Levels
41 Cunningham Street, Pindimar - Tuesday 14 November 2000



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Statistical Noise Levels
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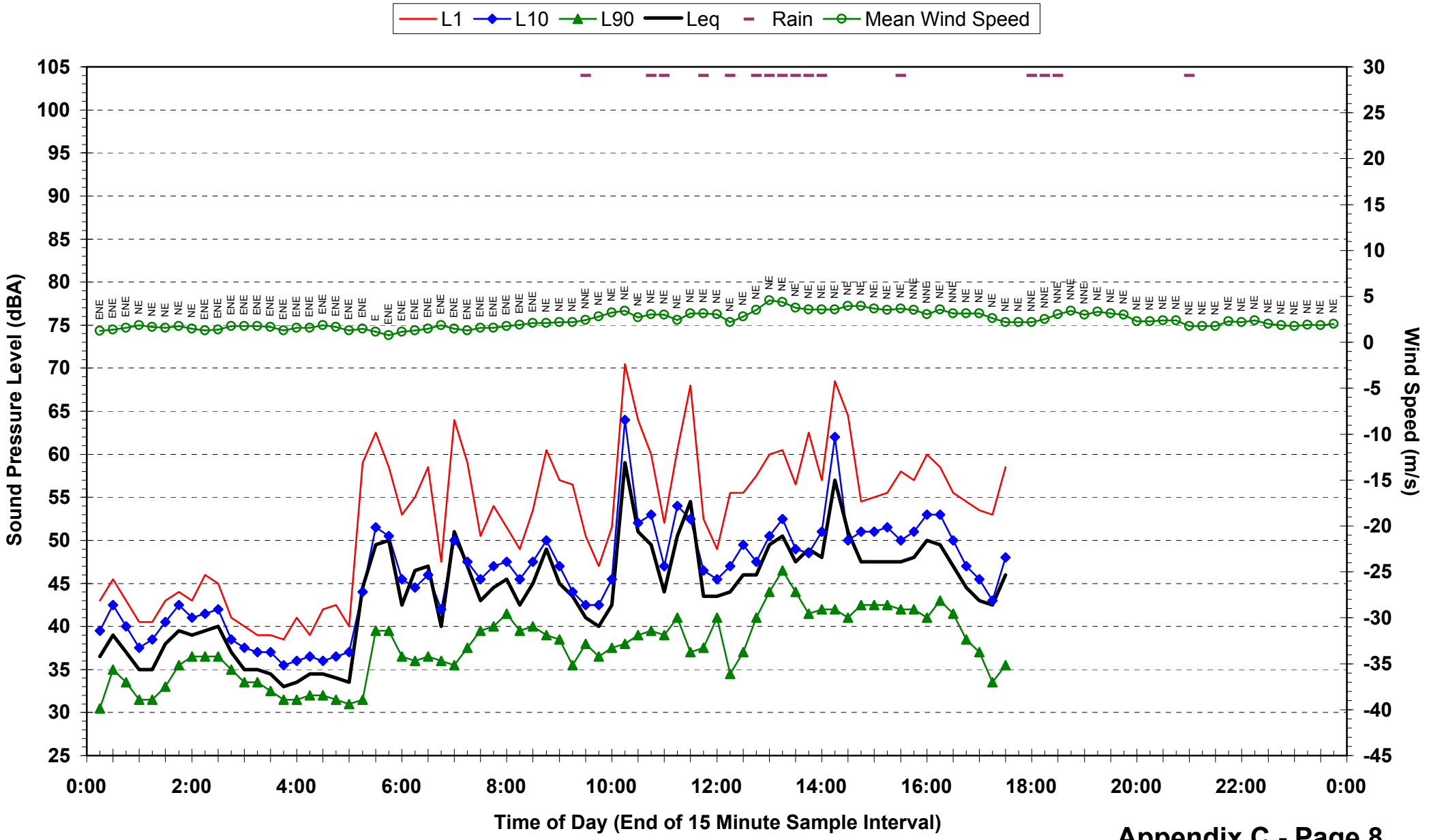
Statistical Ambient Noise Levels
41 Cunningham Street, Pindimar - Wednesday 15 November 2000



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Statistical Noise Levels
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