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10 May 2007

Report: 2007305/1904/R3/SL

Prepared for: Delmo Albion Park Pty Ltd

PROPOSED ILLAWARRA REGIONAL BUSINESS PARK

ASSESSMENT OF INDUSTRIAL NOISE IMPACT

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1. EXECUTIVE SUMMARY

Delmo Albion Park Pty Ltd has proposed to develop the site located on land within the Illawarra Regional Business Park site bound by Tongarra Road and Illawarra Highway to provide a range of office, retail and light industrial uses.

The nearest potentially affected residential receivers are those located to the west, south-west, south and south-east of the proposed development site.

This report contains the results of unattended noise monitoring conducted in the vicinity of the nearest potentially affected residential receivers and is representative of the existing background noise levels at the nearest potentially affected residential receivers in the absence of noise generated by the proposed development site. The results of the unattended noise monitoring and calculations of the potential noise emissions from the operations have been assessed using the methodology and assessment criteria recommended by the Environment Protection Authority (EPA) New South Wales Industrial Noise Policy.

2. INTRODUCTION

This report presents our assessment of potential operational noise impacts from the proposed development to be located on land within the Illawarra Regional Business Park bound by Tongarra Road and Illawarra Highway, Albion Park. The measures available to mitigate any identified impacts are presented.

The potential noise impacts at the nearby residential land uses from the operation of the proposed units has been assessed by:

- Predicting the noise levels generated at the nearest residential premises from the proposed development.
- Comparing the noise levels potentially generated by the proposed development to the existing background noise levels established in recent times from long term unattended noise monitoring.
- Determining whether the noise levels comply will comply with those established using the EPA New South Wales Industrial Noise Policy.

This assessment has been based on the architectural drawings referenced in Table 1.

Table 1 – Referenced Drawings and Reports

Consultant	Drawing / Report Number/Title	Dated
Julius Bokor Architect Pty Ltd (Architecture)	Concept Plan	March 2007
Masson Wilson Twiney (Traffic Consultant)	063273r01_v01	11 April 2007

3. EXISTING CONDITIONS

3.1 GENERAL DESCRIPTION

The proposed development is to be located on land within the Illawarra Regional Business Park bound by Tongarra Road and Illawarra Highway, Albion Park and is adjacent to the Illawarra Regional Airport and residential land uses. It is proposed that the site will be used to provide a range of office, retail and light industrial uses.

Tongarra Road and Illawarra Highway form the southern boundary and western boundaries of the proposed site, both of which are two lane roadways carrying light to medium volumes of vehicular traffic. The eastern side of the proposed site is bound by Illawarra Regional Airport.

3.2 SITE TOPOGRAPHY

The site slopes uphill from approximately RL 10 southeast to approximately RL 14.

3.2.1 Local Noise Sources

Existing ambient noise levels are dominated by transportation noise from vehicles using the surrounding roadways and aircraft movements associated with the normal operation of the Illawarra Regional Airport.

3.3 NOISE MONITORING

Unattended background noise monitoring was conducted in order to characterise the existing noise environment at the nearest potentially affected receivers in the absence of noise generated by the proposed development.

3.3.1 Locations Monitored

Unattended noise monitoring was conducted towards the south-east of the proposed development as illustrated in Figure 2.

3.3.2 Environmental Noise Levels

Environmental noise constantly varies in level, due to fluctuations in local noise sources including road traffic. Accordingly, a 15 minute measurement interval is normally utilised. Over this period, noise levels are monitored on a continuous basis and statistical and integrating techniques are used to determine noise description parameters.

In the case of environmental noise three principle measurement parameters are used, namely L_{10}, L_{90} and L_{eq}.

The L_{10} and L_{90} measurement parameters are statistical levels that represent the average maximum and average minimum noise levels respectively, over the measurement intervals.

The L_{10} parameter is commonly used to measure noise produced by a particular intrusive noise source since it represents the average of the loudest noise levels produced by the source.

Conversely, the L_{90} level (which is commonly referred to as the background noise level) represents the noise level heard in the quieter periods during a measurement interval. The L_{90} parameter is used to set the allowable noise level for new, potentially intrusive noise sources since the disturbance caused by the

new source depends on how audible it is above the pre-existing noise environment, particularly during quiet periods, as represented by the L_{90} level.

The L_{eq} parameter represents the average noise energy during a measurement period. This parameter is derived by integrating the noise levels measured over the measurement period. L_{eq} is important in the assessment of traffic noise impact as it closely corresponds with human perception of a changing noise environment; such is the character of industrial noise.

3.3.3 Period of Measurement

Unattended noise monitoring was conducted between the period of 28 March 2007 and 4 April 2007. It is noted that the obtained data is representative of the existing background noise levels in the absence of the proposed development.

3.3.4 Measurement Equipment

Unattended noise monitoring was conducted over an eight day period in order to characterise the existing noise environment using an Acoustic Research Laboratories Pty Ltd noise monitor. The monitor was programmed to store 15-minute statistical noise levels throughout the monitoring period. The monitor was calibrated at the beginning and end of the measurement period using a RION NC-73 sound level calibrator with no significant drift detected. All noise measurements were taken on A-weighted fast response mode.

3.3.5 Existing Background and *"Amenity"* Noise Levels

Background noise levels during day time are dominated by general residential vehicular traffic. The EPA Industrial Noise Policy details specific steps in determining the background noise level for assessment of the day, evening and night time periods. Table 2 summarises the background determined at the monitoring location, based on the guidelines set out in the EPA Industrial Noise Policy and the results of unattended noise monitoring.

Table 2 –Measured Ambient Noise Levels

Location	Description	Day Noise Level 7am to 6pm (dB(A))	Evening Noise Level 6pm to 10pm (dB(A))	Night Noise Level 10pm to 7am (dB(A))
Nearest Potentially Affected Residential Receivers	Background $L_{90,15min}$	44	41	30

4. PROPOSED DEVELOPMENT

The Delmo Albion Park Pty Ltd proposal is to develop the land within the Illawarra Regional Business Park to provide a range of office, retail and light industrial uses with the potential for 24 hour operation. Any use on the sites would be subject to additional application to Shellharbour City Council for development approval. Figure 1 is an illustration of the proposed development.

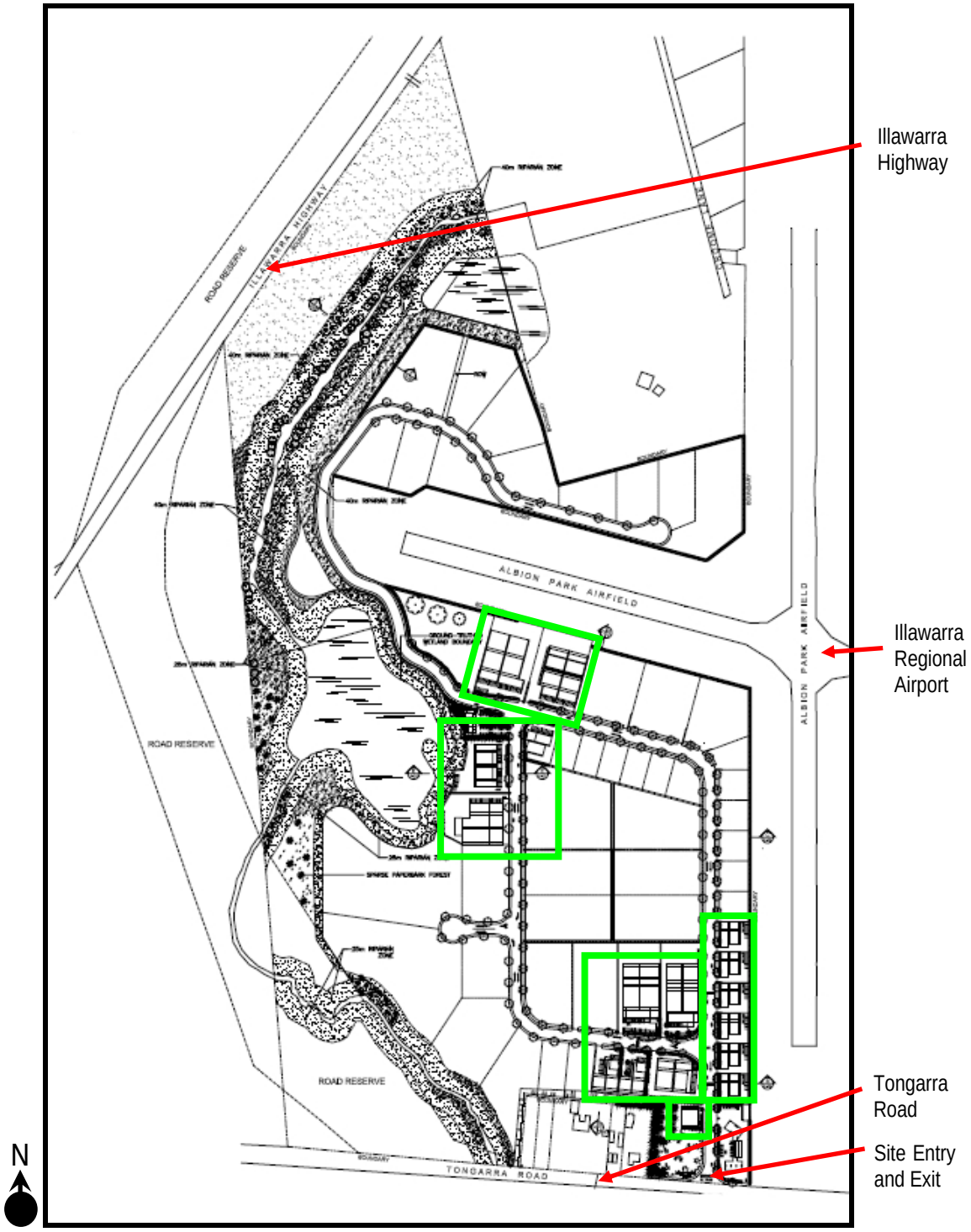


Figure 1 – Site Illustration

5. NEAREST POTENTIALLY AFFECTED RECEIVER

The nearest potentially affected residential receivers are located to the west, south-west, south and south-east of the proposed development site. Below in Figure 2, we present a site survey indicating the locations of the nearest potentially affected residential receivers.

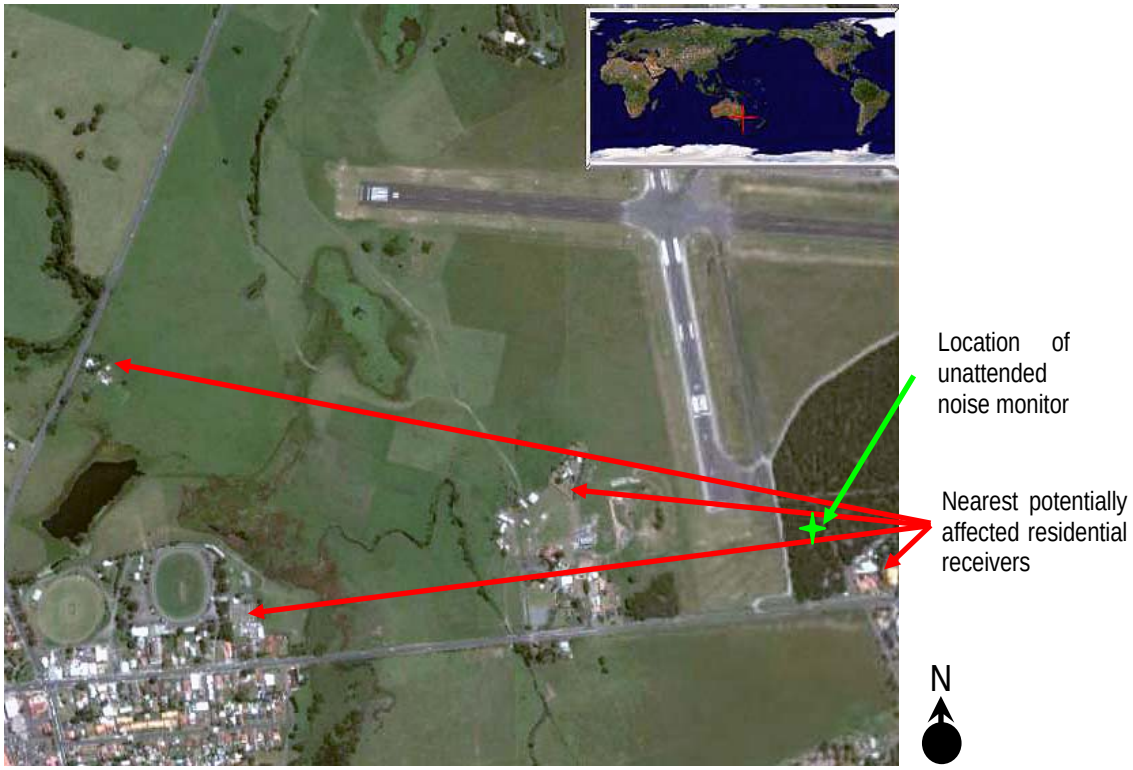


Figure 2 – Nearest Potentially Affected Residential Receiver (*image sourced from Google Maps™*)

6. NOISE EMISSION LIMITS

This assessment has been based on the guidelines stated in the EPA NSW Industrial Noise Policy (2000) and the Environmental Criteria for Road Traffic Noise (1999). Although these two policies are non-mandatory, they set a framework for decision making and the enforcement of provisions relating to noise in the primary legislation.

In this assessment we have adopted the EPA's New South Wales Industrial Noise Policy as it is an up to date tool for the assessment and control of noise from industrial premises. Furthermore, the policy sets out a process to assess noise impact, potential noise mitigation strategies and describes a procedure for predicting, assessing and measuring noise which is not covered by any of the Shellharbour City Council Development Control Plans.

Noise emissions from vehicle movements arriving and departing from the proposed development are assessed in accordance EPA guidelines stated in the *"Environmental Criteria for Road Traffic Noise (1999)"*.

6.1 INDUSTRIAL NOISE POLICY OBJECTIVES/GUIDELINES

The EPA New South Wales Industrial Noise Policy provides guidelines for the assessment of noise impacts from industrial and commercial premises. The recommended assessment objectives vary depending on the nearest potentially affected receivers, the time of day and the type of noise source. The EPA New South Wales Industrial Noise Policy has two requirements that must both be satisfied; that is, an intrusiveness criterion and an amenity criterion.

6.1.1 Intrusiveness Criterion

The guideline is intended to limit the audibility of noise emissions, and requires that noise emissions measured using the L_{eq} descriptor not exceed the existing background noise level by more than 5 dB(A) Where applicable, the intrusive noise level should be penalised (increased) to account for any annoying characteristics such as tonality.

6.1.2 Amenity Criterion

The guideline is intended to limit the absolute noise level from all noise sources to a level that is consistent with the general environment.

The EPA New South Wales Industrial Noise Policy sets out acceptable noise levels for various localities. Table 2.1 titled *"Amenity Criteria"* on page 16 of the Policy designates four categories to distinguish different residential areas. They are rural, suburban, urban and urban/industrial interface. The EPA New South Wales Industrial Noise Policy also includes recommended noise levels for other land uses such as commercial and industrial premises.

Table 3 presents the amenity criteria applicable to the nearest potentially affected residential receivers sited to the west, south-west, south and south-east of the proposed development site. The receiver type utilised against the indicative noise amenity area is defined by the rural criteria.

Table 3 – EPA Recommended Acceptable Noise Levels for Nearest Potentially Affected Residential Receivers

Time of Day	Recommended Acceptable Noise Level dB(A) L_{Aeq}
Day (7.00am to 6.00pm)	50
Evening (6.00pm to 10.00pm)	45
Night (10.00pm to 7.00am)	40

6.2 TRAFFIC GENERATION

6.2.1 Environmental Criteria for Road and Traffic Noise

For land use developments with the potential to create additional traffic on local roads the development should comply with the requirements detailed in the EPA *"Environmental Criteria for Road and Traffic Noise - 1999"*. Criteria applicable to the development are detailed in Table 4. It is noted that the surrounding roadways are deemed as collector roads. If existing noise levels exceed those in Table 4, a 2dB increase in noise is allowed.

Table 4 - Criteria for Traffic Noise for New Developments

Time of day	Criteria for Acceptable Traffic Noise Level dB(A)
Day (7.00am to 10.00pm)	60 $L_{Aeq(1hr)}$
Night (10.00pm to 7.00am)	55 $L_{Aeq(1hr)}$

6.3 SUMMARY OF APPLICABLE ASSESSMENT CRITERIA

The intrusiveness and amenity criteria for this project have been determined using the guidelines presented in the EPA New South Wales Industrial Noise Policy and the unattended noise monitoring data. These are summarised in the following Sections of this report. Table 8 present summaries of the criteria for both the day, evening and night time periods. Table 9 presents a summary of the criteria for vehicle movements created by the proposed development.

6.3.1 Day Time Assessment Period

Table 5 presents the measured L_{A90} background noise levels, and the assessment criteria based on the urban interface criteria. The day period applies between 7.00am to 6.00pm Monday to Saturday; and 8.00am to 6.00pm Sundays and public holidays.

Table 5 – Day Time Period Criteria

Location	Measured L_{A90} Noise Level dB(A)	Amenity Criterion dB(A) L_{Aeq}	Intrusiveness Criterion dB(A) L_{Aeq}
Residential Receivers	44	50	49

Table 5 indicates that the intrusiveness noise level criterion is more stringent than the amenity criterion for the nearest potentially affected residential receiver's sited to the west, south-west, south and south-east of the proposed development site.

6.3.2 Evening Time Assessment Period

Table 6 presents the measured L_{A90} background noise levels, and the assessment criteria based on the urban interface criteria. The evening time period applies between 6pm to 10pm.

Table 6 – Evening Time Period Criteria

Location	Measured L_{A90} Noise Level dB(A)	Amenity Criterion dB(A) L_{Aeq}	Intrusiveness Criterion dB(A) L_{Aeq}
Residential Receivers	41	45	46

Table 6 indicates that the amenity noise level criterion is more stringent than the intrusiveness criterion for the nearest potentially affected residential receiver's sited to the west, south-west, south and south-east of the proposed development site.

6.3.3 Night Time Assessment Period

Table 7 presents the measured L_{A90} background noise levels, and the assessment criteria based on the urban interface criteria. The evening time period applies between 10pm to 7am.

Table 7 – Night Time Period Criteria

Location	Measured L_{A90} Noise Level dB(A)	Amenity Criterion dB(A) L_{Aeq}	Intrusiveness Criterion dB(A) L_{Aeq}
Residential Receivers	30	40	35

Table 7 indicates that the intrusiveness noise level criterion is more stringent than the amenity criterion for the nearest potentially affected residential receiver's sited to the west, south-west, south and south-east of the proposed development site.

6.3.4 Assessment Criteria Summary

Table 8 presents a summary of the prevailing assessment criteria applicable to the proposed development at the nearest potentially affected residential receiver's sited to the west, south-west, south and south-east of the proposed development site.

Table 8 – Noise Objectives

Location	Day Time Noise Objective dB(A) L_{Aeq}	Evening Time Noise Objective dB(A) L_{Aeq}	Night Time Noise Objective dB(A) L_{Aeq}
Residential Receivers	49	46	35

Table 9 presents a summary of the criteria for vehicle movements created by the proposed development in accordance with requirements of the EPA *"Environmental Criteria for Road and Traffic Noise - 1999"*. It is noted that if the existing noise levels exceed those in Table 6, a 2dB increase in noise is allowed.

Table 9 - Criteria for Traffic Noise

Time of day	Criteria for Acceptable Traffic Noise Level dB(A)
Day (7.00am to 10.00pm)	60 $L_{Aeq(1hr)}$
Night (10.00pm to 7.00am)	55 $L_{Aeq(1hr)}$

7. NOISE ASSESSMENT

7.1 PREDICTED NOISE EMISSIONS

Noise emissions to be generated from the proposed development have been predicted to the nearest potentially affected residential receiver's sited to the west, south-west, south and south-east of the proposed development site. The noise levels will be compared to the noise objectives presented in Table 8 of Section 6.4.4 – *"Assessment Criteria Summary"* as determined using the EPA New South Wales Industrial Noise Policy.

The subsequent sections summarise the assessment of noise impact from the various noise sources identified as potentially affecting the nearest receivers.

7.1.1 Vehicle Movements

Noise emissions from truck movements associated with the proposed development site were corrected for distance attenuation, acoustic screening, façade attenuation and air absorption to determine the resultant noise level at the nearest potentially affected residential receivers.

Calculations were based on noise monitoring data obtained at a similar facility, where noise measurements were conducted using a Norsonics SA-110 precision sound level analyser, set to fast response. The precision sound level analyser was calibrated before and after the measurements using a RION NC-73 precision sound level calibrator. No significant drift was recorded. The noise source emission levels used in calculations are presented in Table 10.

Table 10 - Noise Source Emission Levels

Noise Source	Sound Emission Level dB(A) at 7m	Type of Noise Source
Small Truck Reversing alarm	75[1]	Quasi-Steady, tonal
Trucks Manoeuvring/Reversing	75	Quasi-Steady
Truck Air Brakes	89	Transient
Truck Door Closing	75	Transient
Truck Starting	72	Transient
Semi-trailer Starting	89	Transient

[1] A 5 dB(A) penalty has been applied to this source to account for the tonal characteristic of noise produced.

SoundPlan™ has been utilised in order to model the above conditions for both the day time and night-time assessment periods.

Calculations are based on 25 commercial vehicle movements per hour (entering and exiting the proposed site) in conjunction with 578 vehicle movements in the worst one hour.

It is noted that the predicted noise emission levels are based on the worst one hour for the day and night-time assessment periods. The worst one hour periods were determined on peak vehicle (including trucks) movements within the site. The predictions include the ancillary mechanical plant operating in all assessment periods.

Table 11 presented the predicted noise level at the nearest potentially affected residential receivers.

Table 11 – Predicted Noise Emission Levels at Most Affected Residential Receivers

Location	Time of day	Predicted Noise Emission Level dB(A) L_{eq}	Criteria dB(A) L_{eq}	Complies
Residential Receivers to the West	Day (7.00am to 6.00pm)	40	49	Yes
	Evening (6.00pm to 10.00pm)	32	46	Yes
	Night (10.00pm to 7.00am)	32	35	Yes
Residential Receivers to the South-West	Day (7.00am to 6.00pm)	42	49	Yes
	Evening (6.00pm to 10.00pm)	34	46	Yes
	Night (10.00pm to 7.00am)	34	35	Yes
Residential Receivers to the South	Day (7.00am to 6.00pm)	48	49	Yes
	Evening (6.00pm to 10.00pm)	35	46	Yes
	Night (10.00pm to 7.00am)	35	35	Yes
Residential Receivers to the South-East	Day (7.00am to 6.00pm)	44	49	Yes
	Evening (6.00pm to 10.00pm)	34	46	Yes
	Night (10.00pm to 7.00am)	34	35	Yes

The noise predictions clearly illustrate that noise emissions from the development will comply for the proposed operations during both the day time and evening time periods provided the recommendations in Section 8 are implemented.

7.2 TRAFFIC NOISE GENERATION

Review of the Traffic Engineering report provided by Masson Wilson Twiney (MWT) Pty Ltd dated 11 April 2007 validates their estimate of traffic generation based on The Road and Traffic Authorities *"Guide to Traffic Generating Developments (2002)"* on the basis of different types of land uses.

Based upon the MWT Pty Ltd report, the minor overall increase in noise level will be well below the noise levels required to satisfy the EPA *"Environmental Criteria for Road and Traffic Noise - 1999"* guidelines. On this basis, noise generated by vehicles associated with the proposed development would not impact upon

the nearest potentially affected residential receivers and would comply with the EPA road traffic noise criteria.

7.3 MECHANICAL SERVICES PLANT

The proposal also includes ancillary related mechanical services plant (e.g. cooling towers, fans, condensing units etc). The combined cumulative level of noise emissions from the ancillary mechanical services plant will be assessed against the EPA NSW Industrial Noise Policy guidelines for noise intrusion. Since the combined cumulative noise emissions from the proposed development shall not exceed 5dB(A) above the existing background L_{90} noise level at the nearest potentially affected residential receivers, it is proposed that noise emissions from the ancillary mechanical services plant not exceed the existing background L_{90} noise level at the nearest potentially affected residential receivers.

Detailed plant selections are not available at this stage, and as such it is not possible to carry out a detailed examination of the ameliorative measures that may be required in order to achieve the noise objectives as presented in Table 12. This may include selecting the quietest plant practicable, or treating the plant with enclosures, barriers, duct lining and silencers, etc as required to comply with the noise objectives presented in Table 12. Experience with similar projects indicates that it is possible to achieve the regulatory authority requirements with appropriate treatment determined at the Construction Certificate Stage.

Table 12 – Cumulative Mechanical Services Plant Noise Criteria

Location	Day Time Criteria dB(A) L_{Aeq}	Evening Time Criteria dB(A) L_{Aeq}	Night Time Criteria dB(A) L_{Aeq}
Residential Receivers	44	41	30

8. RECOMMENDATIONS

This assessment concludes that based upon typical activities from similar developments and the current traffic predictions from the traffic engineering consultant, barriers as illustrated in Figure 3 and 4 in Appendix 1 of this report will be required in order to comply with the EPA NSW Industrial Noise Policy and the EPA Environmental Criteria for Road Traffic Noise (1999). The indicative treatments are:

- Minimum 2.4m high, solid imperforate barriers to be implemented as illustrated in Figure 3 and 4 in Appendix 1 of this report. The barrier may be constructed from concrete blockwork, Hebel etc ensuring that there are no gaps between panels or at the base of the barrier. The barrier can be combined with mounding to limit the impact on view lines of adjacent properties.

It is noted that the recommendations are indicative and that final barrier requirements will be dependent upon the proposed operations of the future occupants and the configuration of the buildings.

9. CONCLUSION

Potential noise impacts from the proposed development to be located on land within the Illawarra Regional Business Park bound by Tongarra Road and Illawarra Highway has been assessed using the EPA New South Wales Industrial Noise Policy, the EPA Environmental Criteria for Road Noise and the existing background noise levels measured on site which is representative of the existing background noise levels at the nearest potentially affected residential receivers located to the west, south-west, south and south-east of the proposed development site.

Provided the recommendations presented in Section 9 of this report are implemented, then noise emissions from the proposed development will comply with the guidelines presented in the EPA New South Wales Industrial Noise Policy and the EPA Environmental Criteria for Road Noise.

Limits on noise emissions to prevent any adverse noise impact from mechanical services plant that may be installed as part of the proposed development have been recommended. A detailed assessment of noise emissions from this plant should be undertaken as part of the detailed design of the mechanical services plant items. With the provision of appropriate treatment, the recommended noise emissions limits would be achieved.

Report prepared by

ACOUSTIC LOGIC CONSULTANCY PTY LTD
Simon Lappas

APPENDIX ONE
SOUNDPLAN MODELS

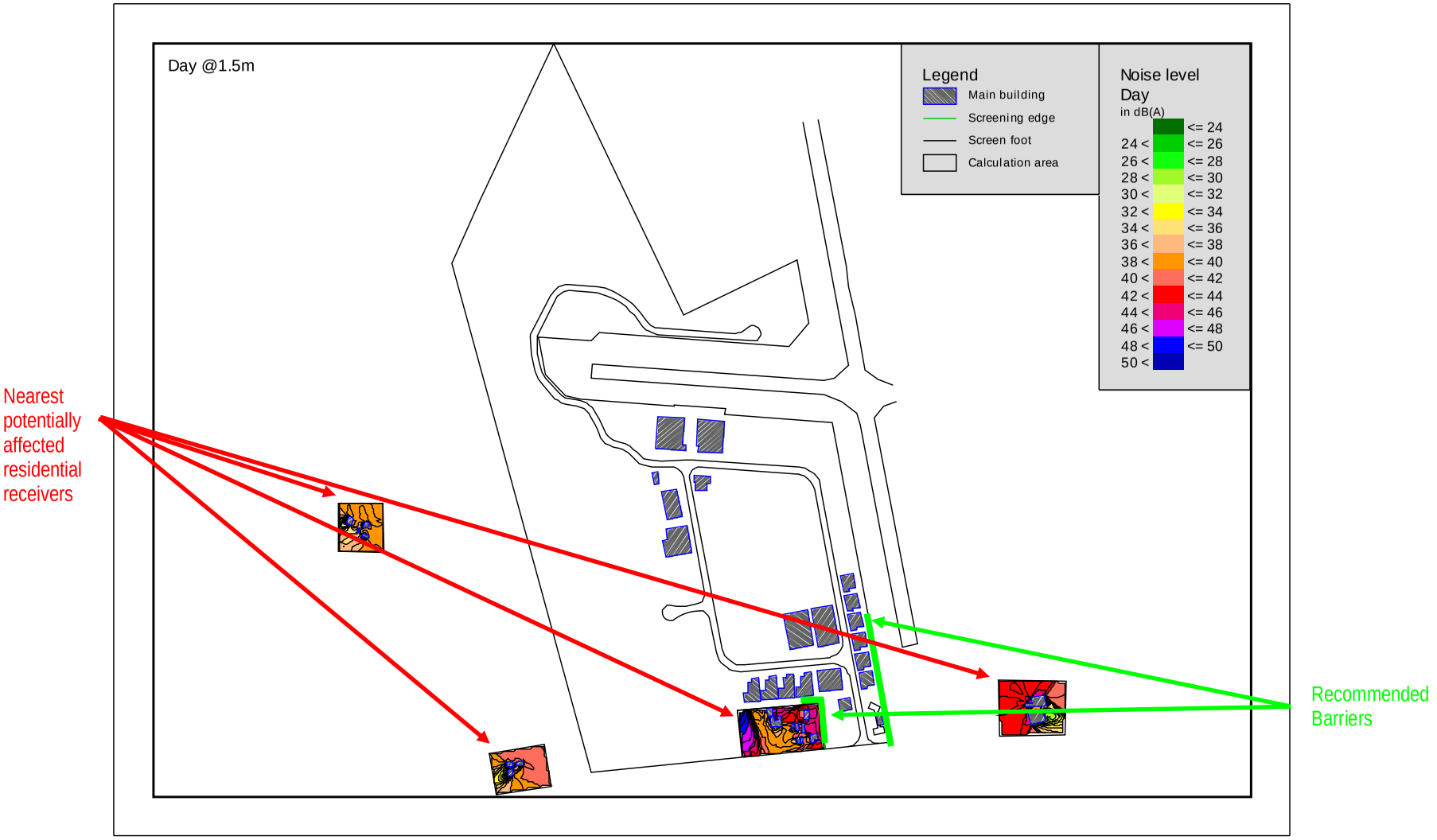


Figure 1 – Worst One Hour Day Time Noise Level Contour

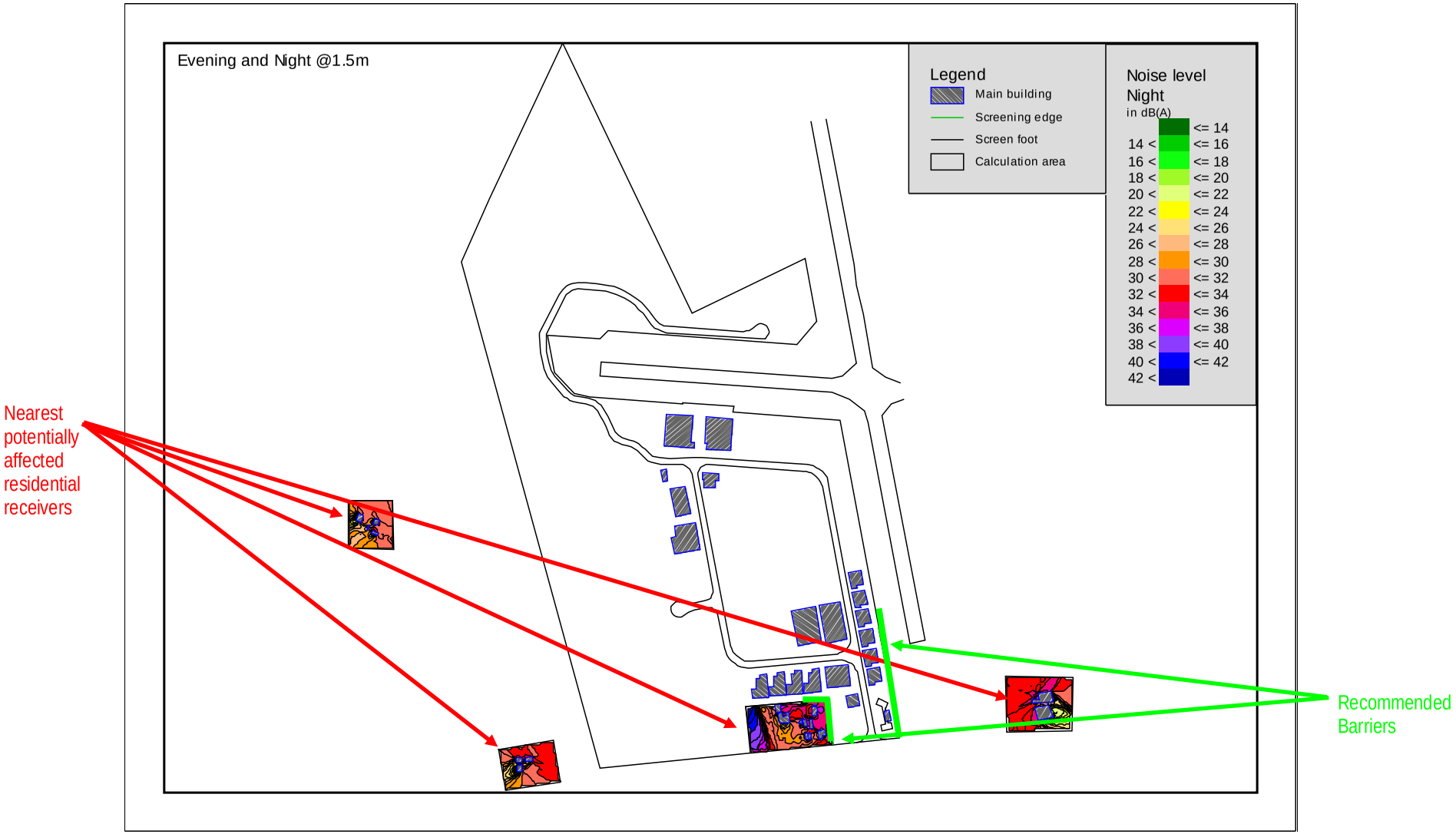
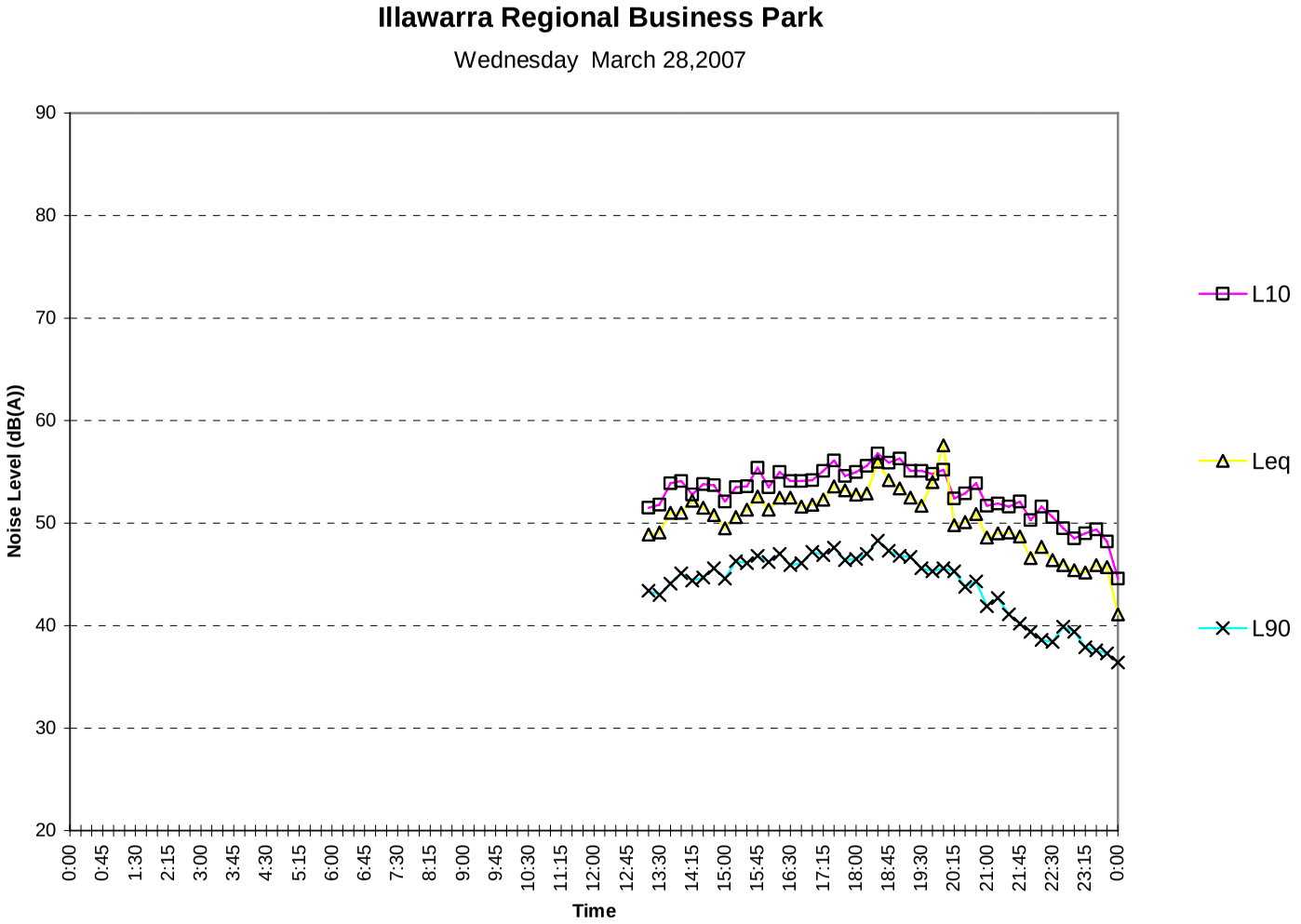


Figure 2 – Worst One Hour Evening and Night Time Noise Level Contour

APPENDIX TWO
UNMANNED NOISE MONITORING DATA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Noise Level (dB(A))
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60
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30
20
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0:45
1:30
2:15
3:00
3:45
4:30
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6:00
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9:00
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12:45
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15:00
15:45
16:30
17:15
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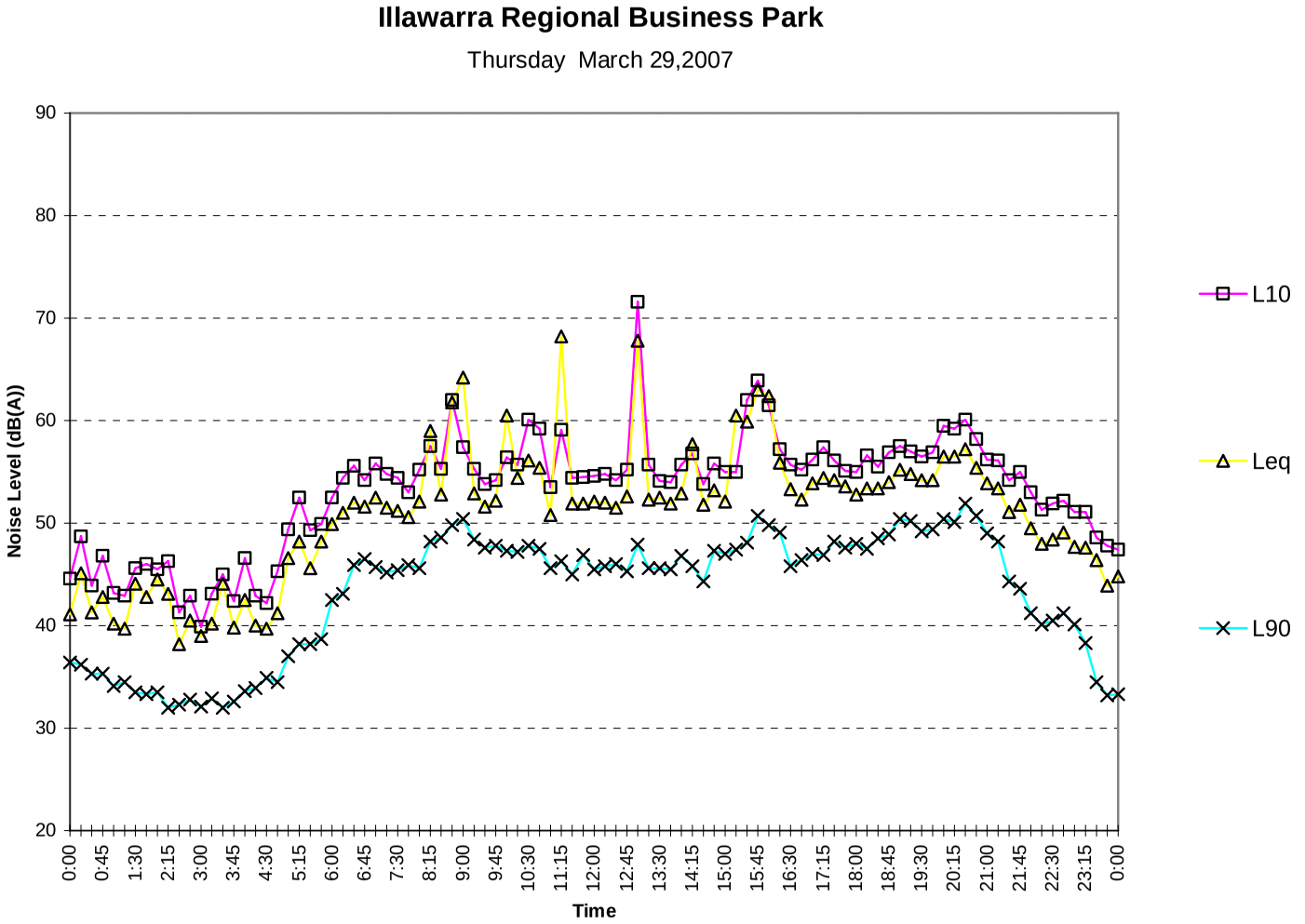
21:00
21:45
22:30
23:15
0:00
Time
L10
Leq
L90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Thursday March 29,2007
Noise Level (dB(A))
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60
50
40
30
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2:15
3:00
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4:30
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6:00
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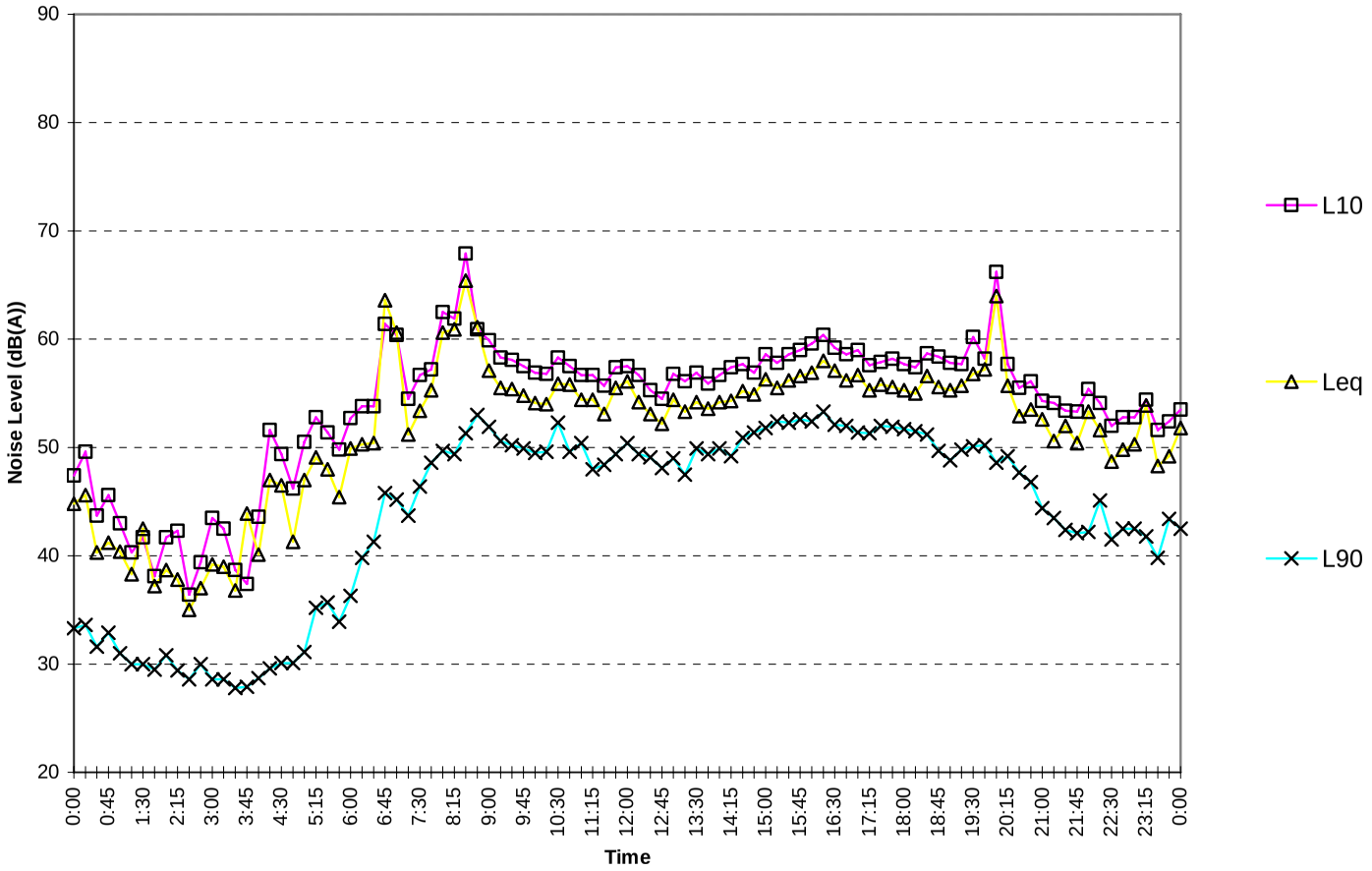
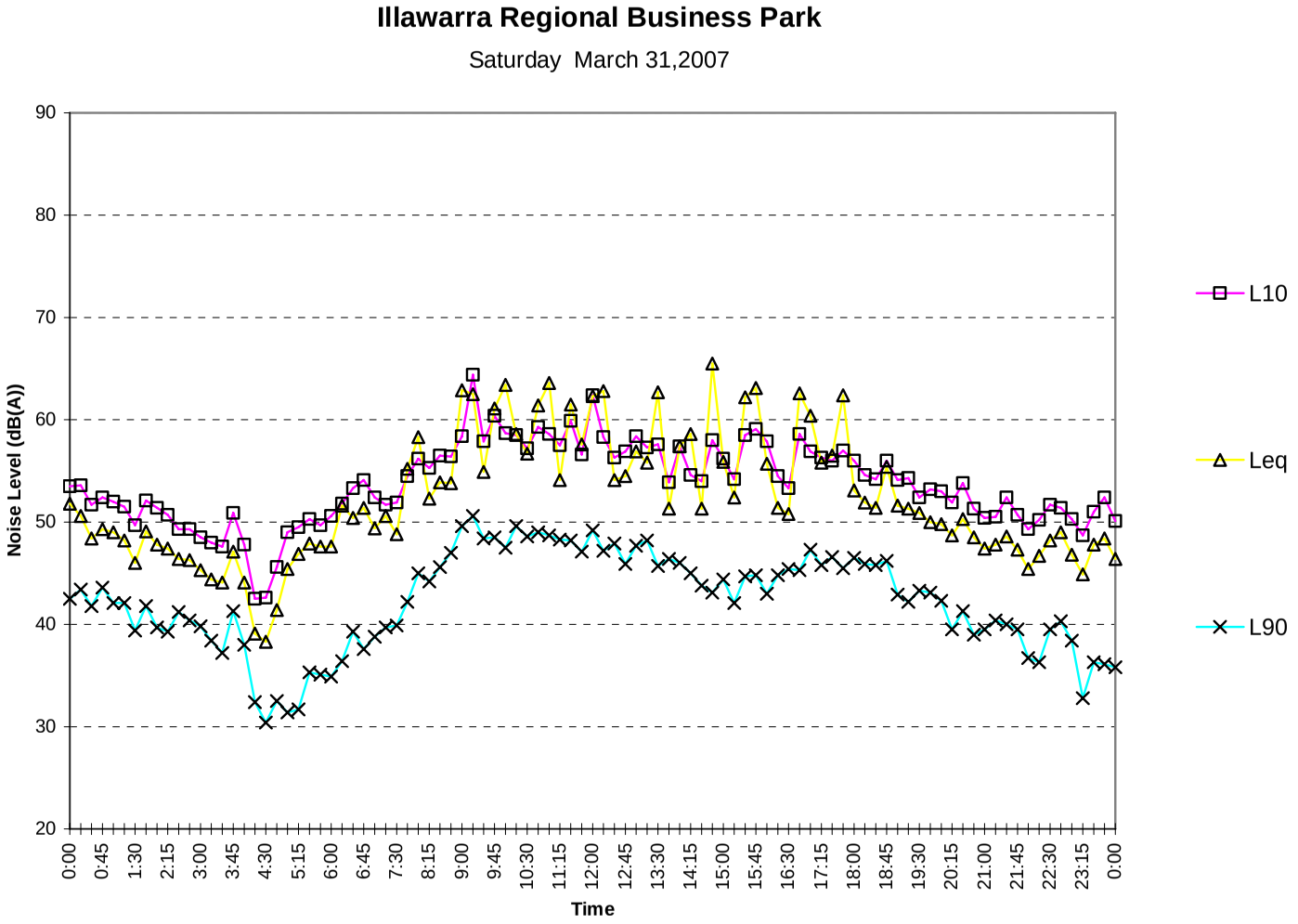
17:15
18:00
18:45
19:30
20:15
21:00
21:45
22:30
23:15
0:00
Time
L10
Leq
L90

Illawarra Regional Business Park

Friday March 30,2007




Illawarra Regional Business Park
Saturday March 31,2007
Noise Level (dB(A))
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30
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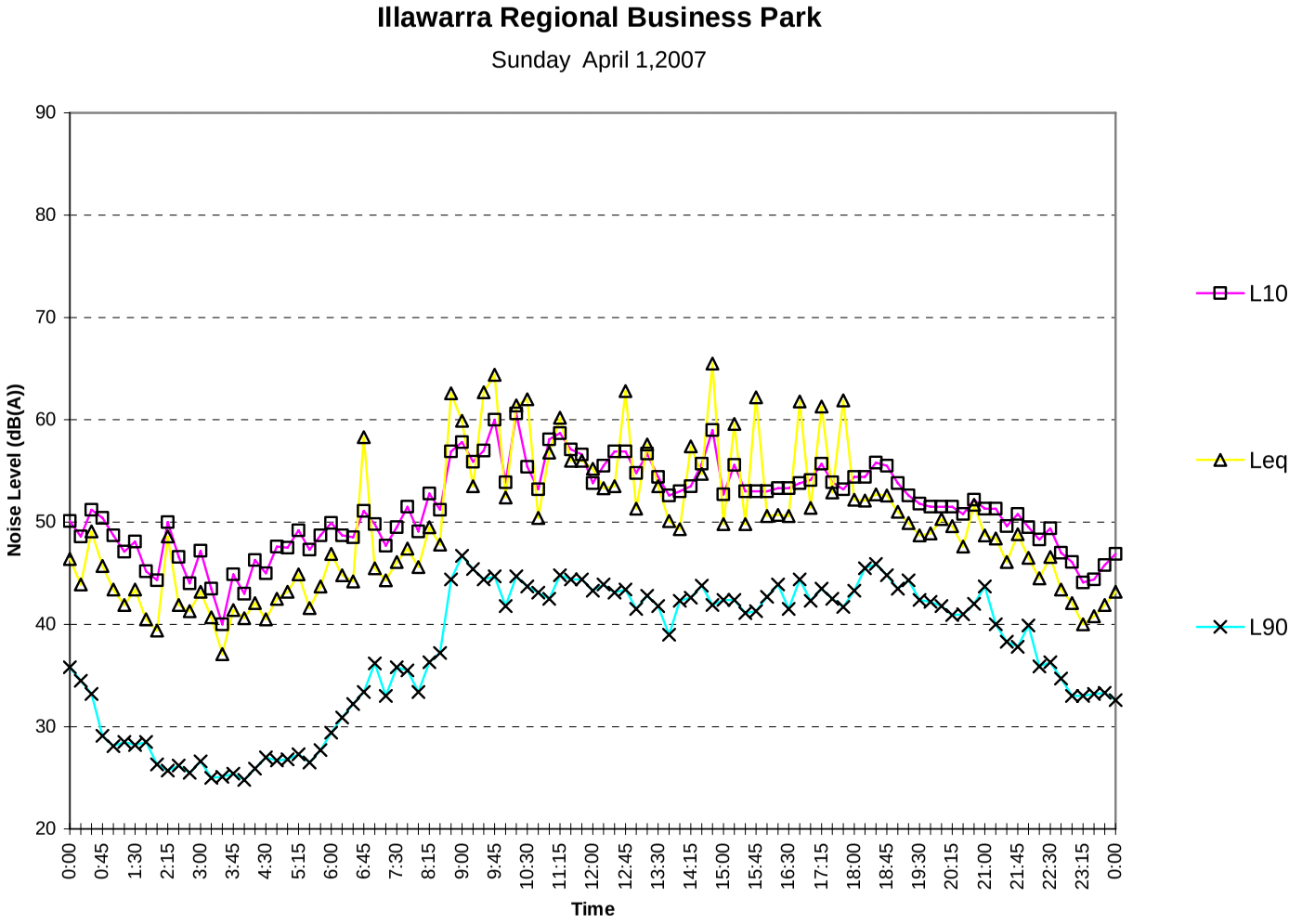
Time
L10
Leq
L90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Sunday April 1,2007
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60
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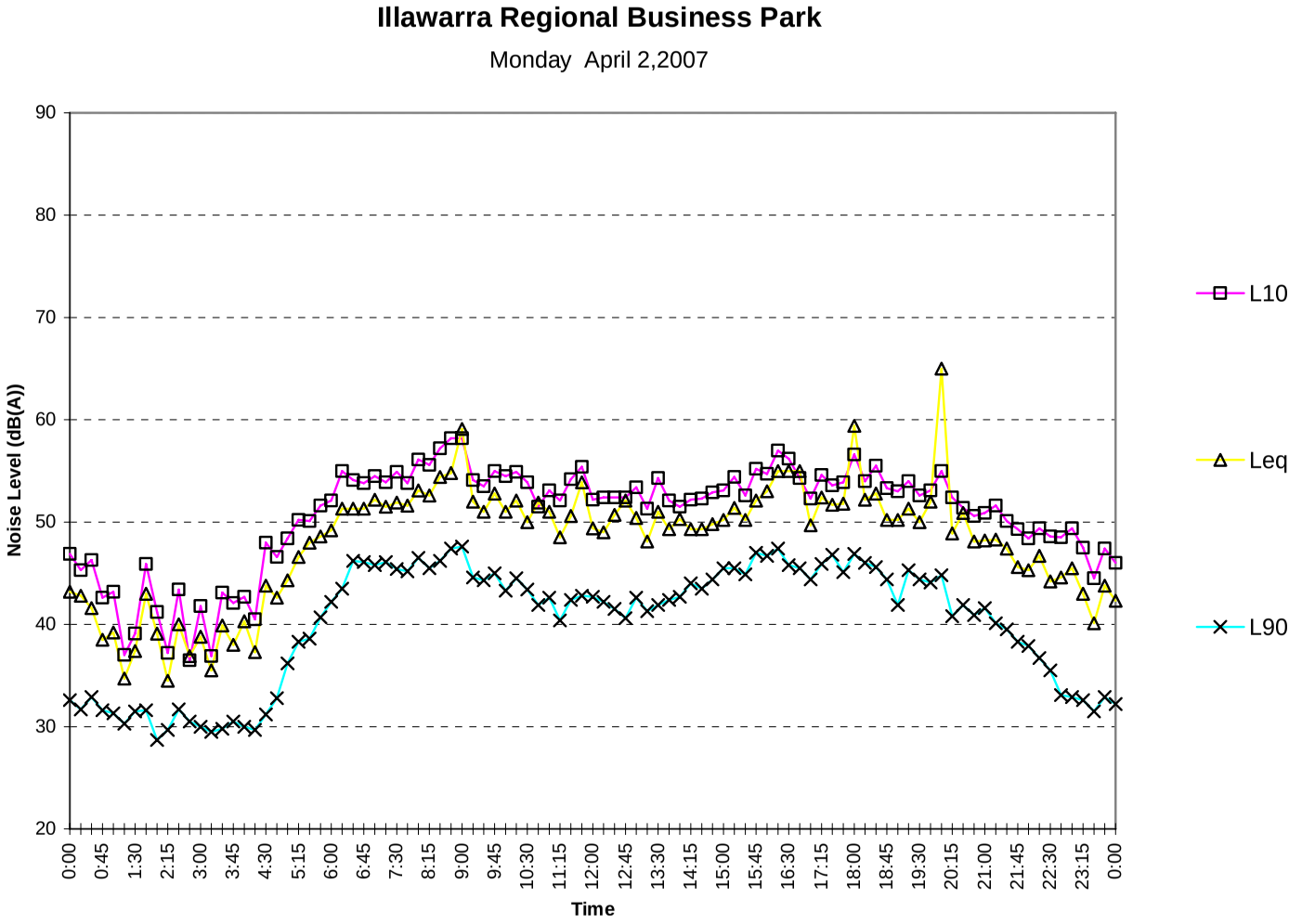
0:00
Time
L10
Leq
L90


Illawarra Regional Business Park
Monday April 2,2007
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60
50
40
30
20
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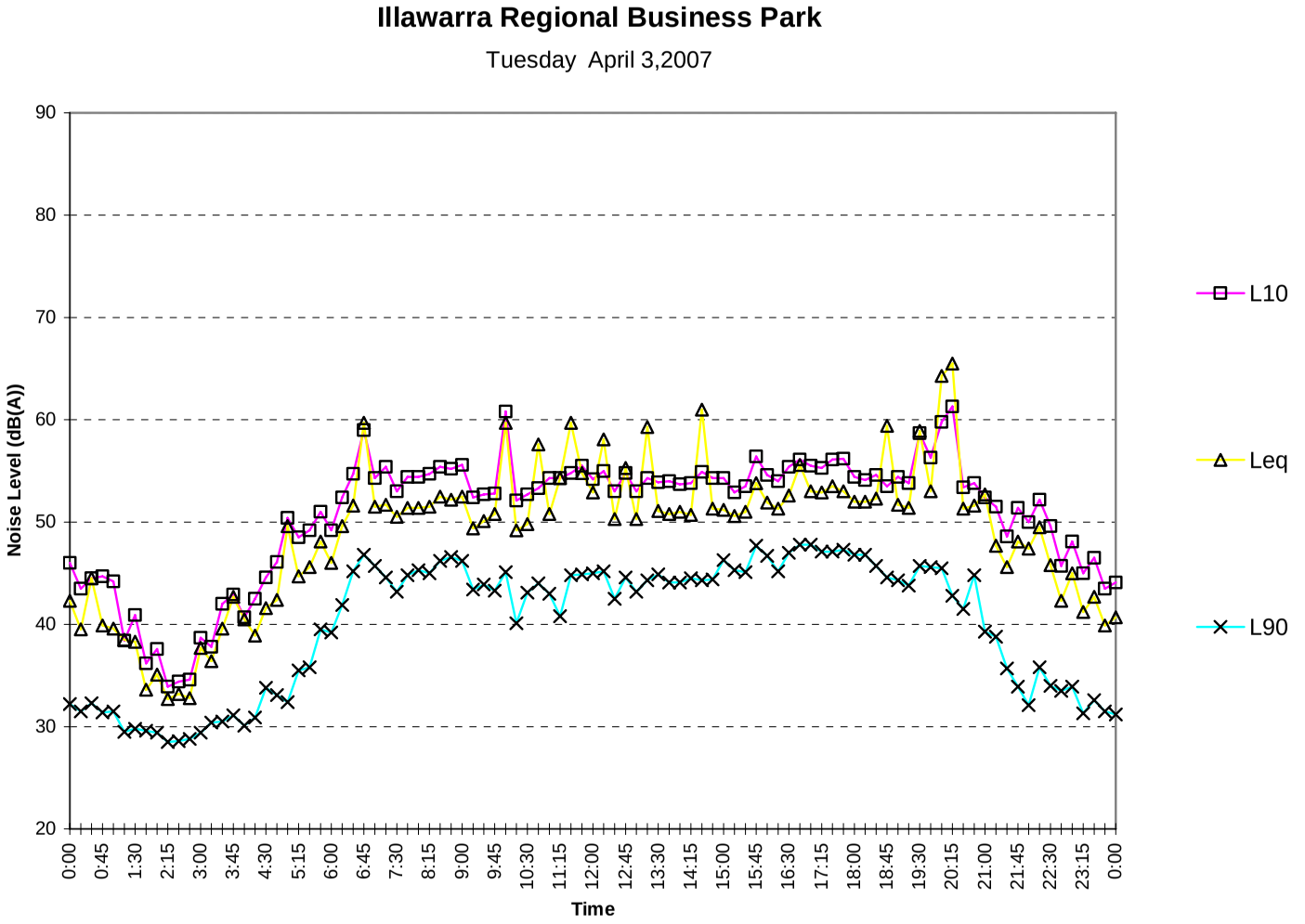
Time
L10
Leq
L90


Illawarra Regional Business Park
Tuesday April 3,2007
Noise Level (dB(A))
90
80
70
60
50
40
30
20
0:00
0:45
1:30
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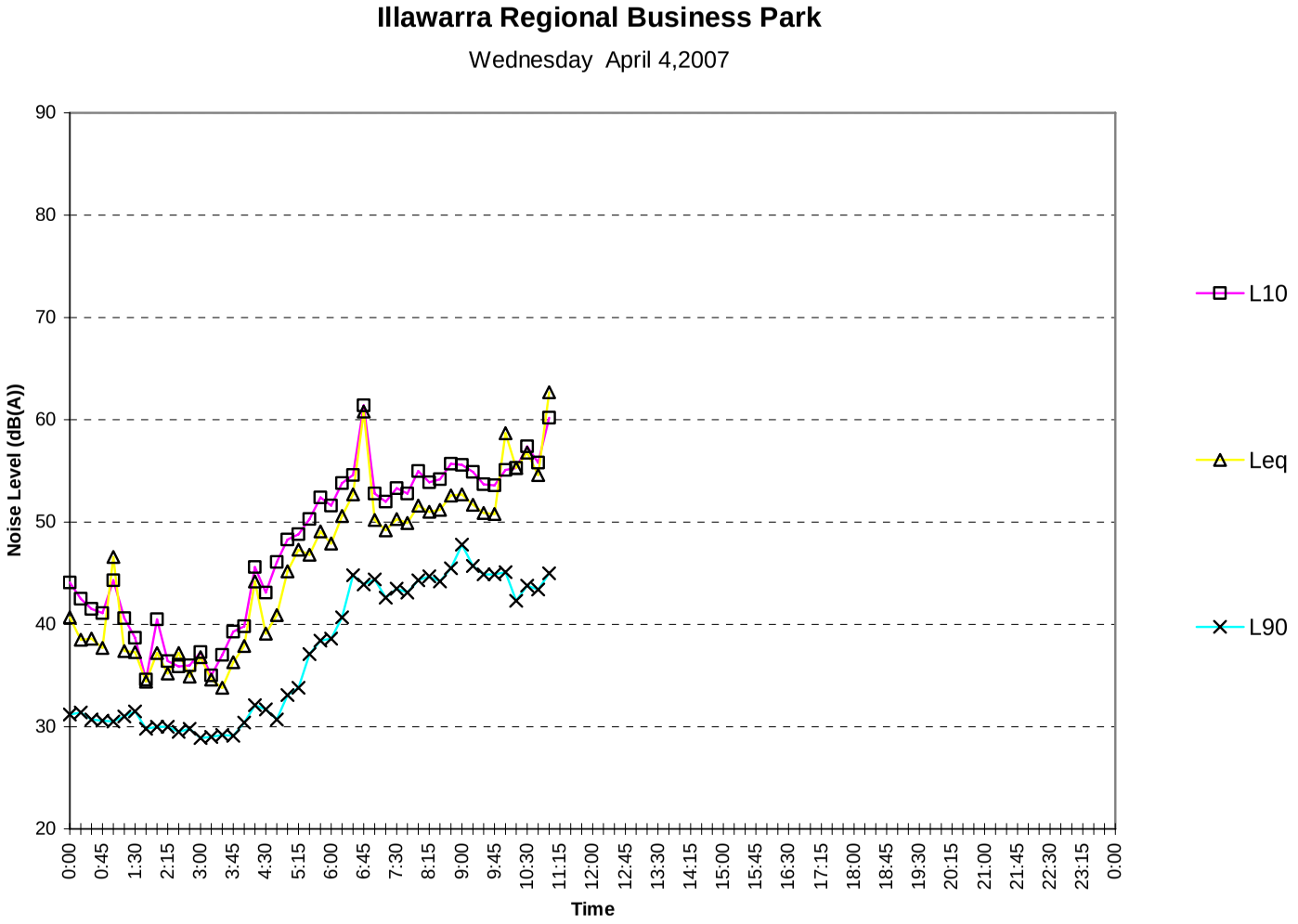
Time
L10
Leq
L90


Illawarra Regional Business Park
Wednesday April 4,2007
Noise Level (dB(A))
90
80
70
60
50
40
30
20
0:00
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Time
L10
Leq
L90

APPENDIX THREE
METEORILOGICAL DATA FOR MARCH 2007

Albion Park, New South Wales
March 2007 Daily Weather Observations

Australian Government
Bureau of Meteorology

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am						3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	Th	17	28	6						20.7	87		WNW	6	1008.5	25.9	65		NE	19	1005.6
2	Fr	19	28	2						23.7	70		W	9	1008.1	26.4	66		E	19	1005.7
3	Sa	20	31	0						24.4	74		NW	6	1007.4	30.2	62		NE	19	1004.7
4	Su	19	31	0						25.6	77		S	2	1010.9	30.9	50		E	15	1009.2
5	Mo	21	24	4						21.4	92		SSW	9	1013.4	20.8	83		S	20	1014.6
6	Tu	17	24	0.2						19.0	61		S	19	1022.2	23.0	61		S	28	1020.7
7	We	16	24	4						19.2	79		W	7	1019.4	23.1	65		NE	17	1015.7
8	Th	17	27	0.2						23.3	66		ENE	11	1009.9	24.3	77		ESE	2	1007.4
9	Fr	16	24	13						19.7	56		W	9	1013.7	22.8	61		S	20	1012.9
10	Sa	13	25	0						19.4	69		S	15	1011.3	23.4	55		SSE	19	1007.4
11	Su	13	27	0						19.6	71			Calm	1005.1	26.5	59		ENE	17	1002.2
12	Mo	19	24	0.6						19.1	83		W	2	1013.5	23.5	58		SSW	20	1014.2
13	Tu	17	23	12						18.2	76		S	22	1021.4	19.4	78		SSW	19	1020.5
14	We	11	24	0						17.1	85			Calm	1020.8	23.5	57		NE	15	1018.8
15	Th	12	28	0						21.8	70		NNW	13	1018.9	25.1	63		ENE	28	1014.5
16	Fr	16	33	0						21.3	88			Calm	1011.5	29.9	49		NW	19	1008.8
17	Sa	21	25	0						23.8	75		S	7	1013.9	20.4	87		SSE	20	1015.2
18	Su	17	23	7						18.7	83		WSW	4	1022.7	22.3	66		ENE	9	1020.9
19	Mo	19	24	0.8						22.6	72		N	11	1020.2	21.8	80			Calm	1018.8
20	Tu	20	29	3						24.2	78			Calm	1016.6	27.3	64		W	6	1014.9
21	We	21	25	0						22.8	89			Calm	1019.2	23.8	78		SSE	15	1021.3
22	Th	20	28	0.4						23.7	84			Calm	1024.2	26.3	79		ENE	24	1020.9
23	Fr	17	27	0						22.8	91		NNE	6	1020.7	25.7	76		ENE	24	1016.7
24	Sa	18	34	0						24.2	80		ENE	9	1010.8	31.5	48		S	6	1008.1
25	Su	15	21	12						17.6	61		SSW	37	1024.1	17.4	78		S	26	1024.6
26	Mo	15	22	7						18.4	67		S	11	1027.4	20.4	55		SSE	20	1025.0
27	Tu	14	22	1.0						20.7	60		SSE	7	1023.1	21.0	57		ESE	9	1018.5
28	We	9	25	0						21.0	57		NNE	7	1015.1	23.5	62		ENE	22	1010.5
29	Th	15	23	0						19.5	89		W	7	1007.7	21.9	81			Calm	1005.3
30	Fr	14	22	0.2						19.0	41		W	28	1012.6	21.5	40		W	33	1011.6
31	Sa	13	23	0						19.8	42		SSW	20	1019.7	21.9	46		SSE	19	1019.4
Statistics for March 2007																					
	Mean	16.5	25.7							21.0	73			9	1015.9	24.0	64			17	1014.0
	Lowest	9	21							17.1	41			Calm	1005.1	17.4	40			Calm	1002.2
	Highest	21	34	13						25.6	92		SSW	37	1027.4	31.5	87		W	33	1025.0
	Total			73.4																	

Observations were drawn from Albion Park (Wollongong Airport) {station 068241}

The closest station with sunshine and evaporation observations is at Sydney Airport, about 77 km to the north. The closest station with cloud observations is at Wollongong, about 30 km to the north.

IDCJDW2001.200703 Prepared at 13:00 GMT on 21 Apr 2007

APPENDIX FOUR
METEORILOGICAL DATA FOR APRIL 2007

Albion Park, New South Wales
April 2007 Daily Weather Observations

Australian Government
Bureau of Meteorology

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am						3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	Su	12	23	0						20.1	61		S	15	1025.9	22.1	55		ESE	13	1023.6
2	Mo	10	26	0						21.4	62			Calm	1022.8	24.0	63		NE	22	1017.8
3	Tu	11	23	0						20.9	66		NE	7	1021.5	21.5	69		SE	19	1020.6
4	We	13	24	2						19.9	80			Calm	1024.6	22.7	69		ENE	13	1022.0
5	Th	11	24	0						21.6	66		E	9	1019.9	20.9	67		S	24	1019.5
6	Fr	14	22	0.2						16.0	82		S	22	1025.5	19.9	53		S	24	1025.1
7	Sa	15	21	1.0						18.2	72		SSW	20	1029.6	18.3	81		S	15	1028.7
8	Su	13	21	13						17.4	82		SSW	20	1032.5	19.2	73		SSW	9	1031.0
9	Mo	12	22	1.0						17.4	89		SW	11	1033.7	21.8	57		NE	13	1030.8
10	Tu	8	23	0						18.7	69			Calm	1030.4	22.9	59		ENE	15	1026.4
11	We	8	27	0						18.1	69		W	4	1024.3	22.9	60		SSE	22	1023.9
12	Th	13	23	4						20.6	65		NW	2	1027.9	21.7	61		NE	17	1024.3
13	Fr	9	23	0						19.6	70		WSW	6	1028.4	21.9	67		ESE	13	1025.8
14	Sa	10	25	0						20.5	64			Calm	1026.4	23.0	62		NE	22	1021.3
15	Su	9	26	0						20.4	68			Calm	1019.1	23.8	72		NE	7	1015.6
16	Mo	12	24	0.6						22.2	62			Calm	1016.2	22.2	63		S	24	1014.7
17	Tu	13	24	0						20.8	71		W	7	1017.6	22.4	65		SSE	15	1015.6
18	We	11	24	0						20.8	74		NW	2	1018.4	22.9	70		NE	24	1015.7
19	Th	10	22	0						17.6	86			Calm	1018.1	21.1	80		NE	9	1015.7
20	Fr	13	24	0						21.5	70		SW	17	1017.8	21.8	62		SSE	20	1016.4
21	Sa	9	24	0						18.1	76			Calm	1018.8	22.2	61		NE	13	1016.3
22	Su	13	23	0						18.0	93			Calm	1018.2	18.5	92		SSW	15	1017.4
23	Mo	16	21	17						18.5	72		SSW	22	1021.9	19.5	72		S	26	1021.0
24	Tu	15		42						15.4	95		WNW	7	1025.8	17.6	85		SSW	19	1023.7
Statistics for the first 24 days of April 2007																					
	Mean	11.7	23.4							19.3	73			7	1023.6	21.4	67			17	1021.4
	Lowest	8	21							15.4	61			Calm	1016.2	17.6	53		NE	7	1014.7
	Highest	16	27	42						22.2	95		#	22	1033.7	24.0	92		S	26	1031.0
	Total			80.8																	

Observations were drawn from Albion Park (Wollongong Airport) {station 068241}

The closest station with sunshine and evaporation observations is at Sydney Airport, about 77 km to the north. The closest station with cloud observations is at Wollongong, about 30 km to the north.

IDCJDW2001.200704 Prepared at 05:36 GMT on 24 Apr 2007