# DIXON SAND (PENRITH) PTY LTD

# PROCESSING OF CONSTRUCTION SANDS, LOTS 196 AND 29, DP 752025 NORTH MAROOTA, NSW

# **VOLUME 2:**EIS APPENDICES

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# VOLUME 2 CONTINUED

C4, C5, C6, C7, C8, C9, C10

# APPENDIX C4 - NOISE ASSESSMENT

- 1. Introduction
- 2. Strategic Planning Context
- 3. Company's Development Strategy
- 4. Existing Acoustic Environment
- 5. Predicted Noise Impact
- 6. Safeguards
- 7. Conclusions and Recommendations

#### **NOISE IMPACT ASSESSMENT REPORT** For Continued Sand Extraction and **Processing Operation at** Dixon Sand (Penrith) Pty Ltd, Maroota

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Report No:

EE 2622 DS

February, 99 Final Issue (Released 19 February 1999)

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1.	INTRO	DUCTION	1
2.	GLOS	SARY OF TERMS	5
3.	ACOUS	STIC CRITERIA	9
3.1	Baulk	tham Hills Shire Council DCP No. 500	g
3.2	Existi 3.2.1	ng NSW EPA Assessment Criteria	
3.3	NSW	EPA Draft Stationary Noise Source Policy	13
3.4	Existi 3.4.1 3.4.2	ng Traffic Noise Criteria NSW EPA Traffic Noise Criteria RTA Interim Traffic Noise Policy	
3.5	Propo	osed Road Traffic Noise Criteria	17
4.	EXIST	ING ACOUSTIC ENVIRONMENT	18
4.1	Monit	oring Locations and Methodology	18
4.2	Noise	Monitoring Results	22
	4.2.1	Location A	23
	4.2.2	Location B	
	4.2.3	Location C	
	4.2.4	Location D	
	4.2.5	Location E	
	4.2.6	Location F	
	4.2.7 4.2.8	Location G Comments	
4.3	Site N	Noise Design Objectives	32
	4.3.1	Existing Criteria	
	4.3.2	Proposed Criteria	
	4.3.3	Summary of the design objectives	

5.	PREDI	CTED NOISE IMPACT	37
5.1		ational Site Noise	37
	5.1.1 5.1.2	Predicted Noise Levels Proposed Additions to the Plant	42 55
5.2		Traffic Noise	56
	5.2.1 5.2.2	Traffic CountsTNOISE Modelling	57
	5.2.3 5.2.4	Assessment of Traffic Noise Impact Traffic Noise Impact at Maroota Public School	61 63
6.	SAFEG	BUARDS	64
7.	CONCI	LUSION AND RECOMMENDATIONS	66
A T-		AITC	



#### 1. INTRODUCTION

This report presents the findings of a noise impact assessment for continued operations of the sand extraction and processing quarry at Lots 196 and 29 (DP 752025), Maroota. The site is owned by Manaldo Pty Ltd and operated by Dixon Sand (Penrith) Pty Ltd.

This report has been carried out for submission to Baulkham Hills Shire Council with the Environmental Impact Statement for the development prepared by Lyall & Macoun Consulting Engineers.

The noise impact assessment determines the potential noise impact of the continued operations within the surrounding area. The site has been used as a sand extraction and processing quarry for several years. Existing sand extraction and processing quarries are located to the north and south of the site. There are also several agricultural farms in close proximity to the site. The nearest residences are located approximately 550 metres east of the closest point on the site boundary. Maroota North Public School is located approximately 750 metres east of the closest point on the site boundary.

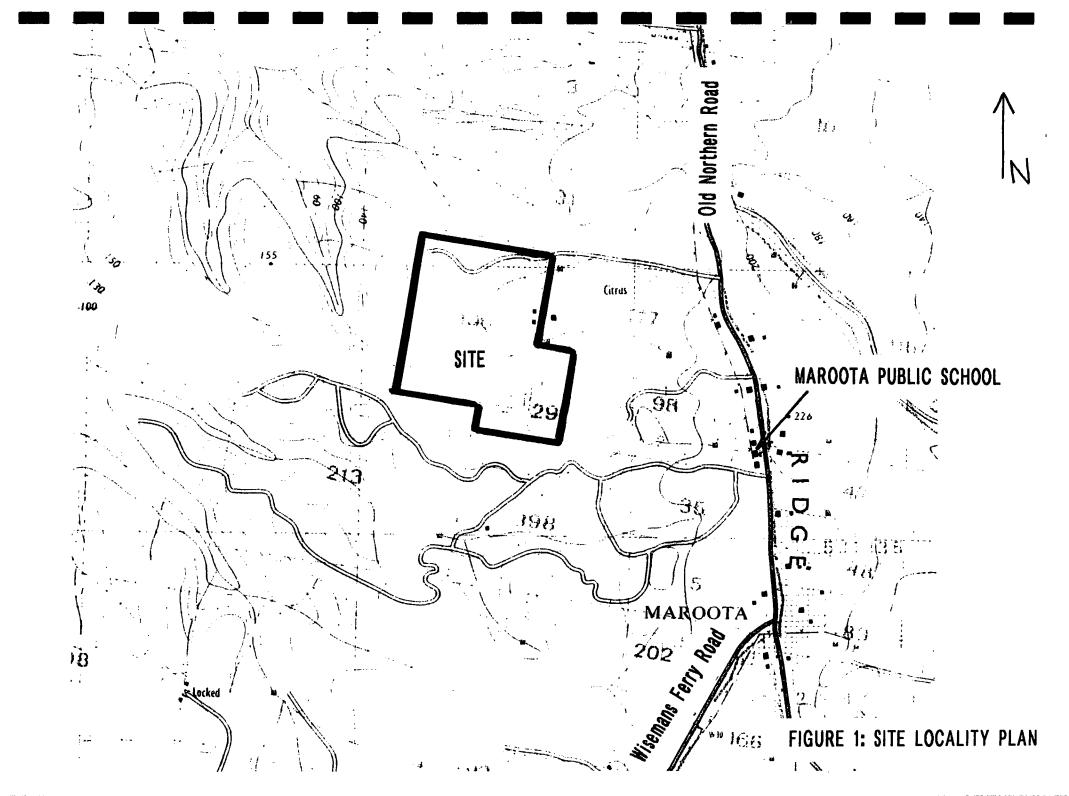
The previous development consent issued by Baulkham Hills Shire Council set the approved operating hours as 6am to 6pm, Monday to Friday and 6am to 1pm, Saturdays. Trucks were not permitted to enter the site before 5.45am. This current application will seek approval for all operations between 6am to 6pm, Monday to Saturday.

Background noise measurements were conducted at the nearest residences in order to establish the existing background noise environment. Current traffic noise measurements along Old Northern Road and Wisemans Ferry Road have also been carried out.

The predicted noise impacts have been assessed against the criteria outlined in the Baulkham Hills Shire Council Development Control Plan No. 500 for Extractive Industries (DCP No. 500) and the New South Wales Environment Protection Authority (NSW EPA) Environmental Noise Control Manual. The NSW EPA Draft Stationary Noise Source Policy has also been considered in the assessment of noise emissions.

Road traffic noise has been assessed against criteria outlined in the NSW EPA Environmental Noise Control Manual, the Roads and Traffic Authority (RTA) Interim Traffic Noise Policy and the NSW EPA Draft Environmental Criteria for Road Traffic Noise.

Figures 1 and 2 show the site locality and the site layout.



#### 2. GLOSSARY OF TERMS

This section provides an explanation of the terms used throughout the report.

In order to characterise the noise levels measured over a period of time the following noise descriptors are used:

- $L_{A1}$  The  $L_{A1}$  is the level of noise exceeded for 1% of the time and is, therefore, the average peak level of noise experienced during the measurement period.
- $L_{A10}$  The  $L_{A10}$  is the level of noise exceeded for 10% of the time and is, therefore, the maximum level of noise experienced during the measurement period.
- L<sub>Aeq</sub>
   The L<sub>Aeq</sub> is the equivalent continuous level of noise and is a single number that is equivalent to the fluctuations of noise level that are occurring based on the energy contained within the noise signal. The L<sub>Aeq</sub> is determined by an integration of the noise level with respect to time.
- $L_{A90}$  The  $L_{A90}$  is the level of noise exceeded for 90% of the sample time and is therefore the minimum level of noise experienced during the measurement period. The  $L_{A90}$  is referred to as the background noise level.

January, 99

The following descriptors are used to assess road traffic noise:

- L<sub>A10,18hour</sub>
   The L<sub>A10,18hour</sub> is the average L<sub>A10</sub> over the period 6am midnight.
- L<sub>Aeq(1hr)</sub>
  Represents the highest L<sub>Aeq</sub> noise level for any hour during the period 7am to 10pm or 10pm to 7am as relevant.
- L<sub>Aeq(15hr)</sub>
  Represents the L<sub>Aeq</sub> noise level for the period 7am to 10pm.
- L<sub>Aeq(9hr)</sub>
  Represents the L<sub>Aeq</sub> noise level for the period 10pm to 7am.

#### Daytime, Evening and Night time periods

For the existing criteria outlined in the NSW EPA Environmental Noise Control Manual, daytime is defined as from 7.00am to 10.00pm, Monday to Saturday, and 8am to 10pm on Sunday and Public Holidays. Night time is defined as 10pm to 7am, Monday to Friday, and 10pm to 8am on Sundays and Public Holidays.

For the proposed criteria outlined in the NSW EPA Draft Stationary Noise Source Policy, daytime is defined as from 7.00am to 6.00pm, Monday to Saturday, and 8am to 6pm on Sundays and Public Holidays. Evening is defined as from 6pm to 10pm and night as the remaining period.

#### Freeway / arterial

Refers to roads handling through traffic, with characteristically heavy and continuous traffic flows during peak periods. Through traffic is traffic passing through a locality bound for another locality.

• Sound Pressure Level (abbreviated SPL)
Is the instantaneous measurement of pressure variations in the ambient air compared to a reference pressure. A precision sound level meter measures SPL and measurements are expressed as dB(A).

#### Assessment Background Level (ABL)

The single figure background level representing each assessment periodday, evening, and night (ie. Three ABLs are determined for each 24-hr period of the monitoring period). It's determination is by the tenth percentile method.

#### Rating Background Level (RBL)

The overall single figure background level representing each assessment period (day/ evening/ night) over the whole monitoring period (as opposed to over each 24hr period used for the ABL) and is the level used for assessment purposes. It is defined as the median value of all the 24hr periods.

# Recommended Maximum L<sub>Aeq</sub> Noise Level (RML)

The recommended maximum  $L_{\text{Aeq}}$  noise level from stationary noise sources alone. Table 2.1 of the NSW EPA Draft Stationary Noise Source Policy sets out the RML for each period of the day and for various types of receivers. The RML is used to protect the amenity of receivers.

#### Tonal Noise

Noise containing a prominent frequency and characterised by a definite pitch.

#### Low frequency noise

Containing major components within the low frequency range (20Hz - 250 Hz) of the frequency spectrum.

#### Impulsive noise

Noise having a high peak of short duration or a sequence of such peaks. A sequence of impulses in rapid succession is termed repetitive impulsive noise.

#### Fluctuating noise

Noise that varies continuously and to an appreciable extent over the period of observation.

#### Intermittent noise

The level suddenly drops to that of the background noise several times during the period of observation.

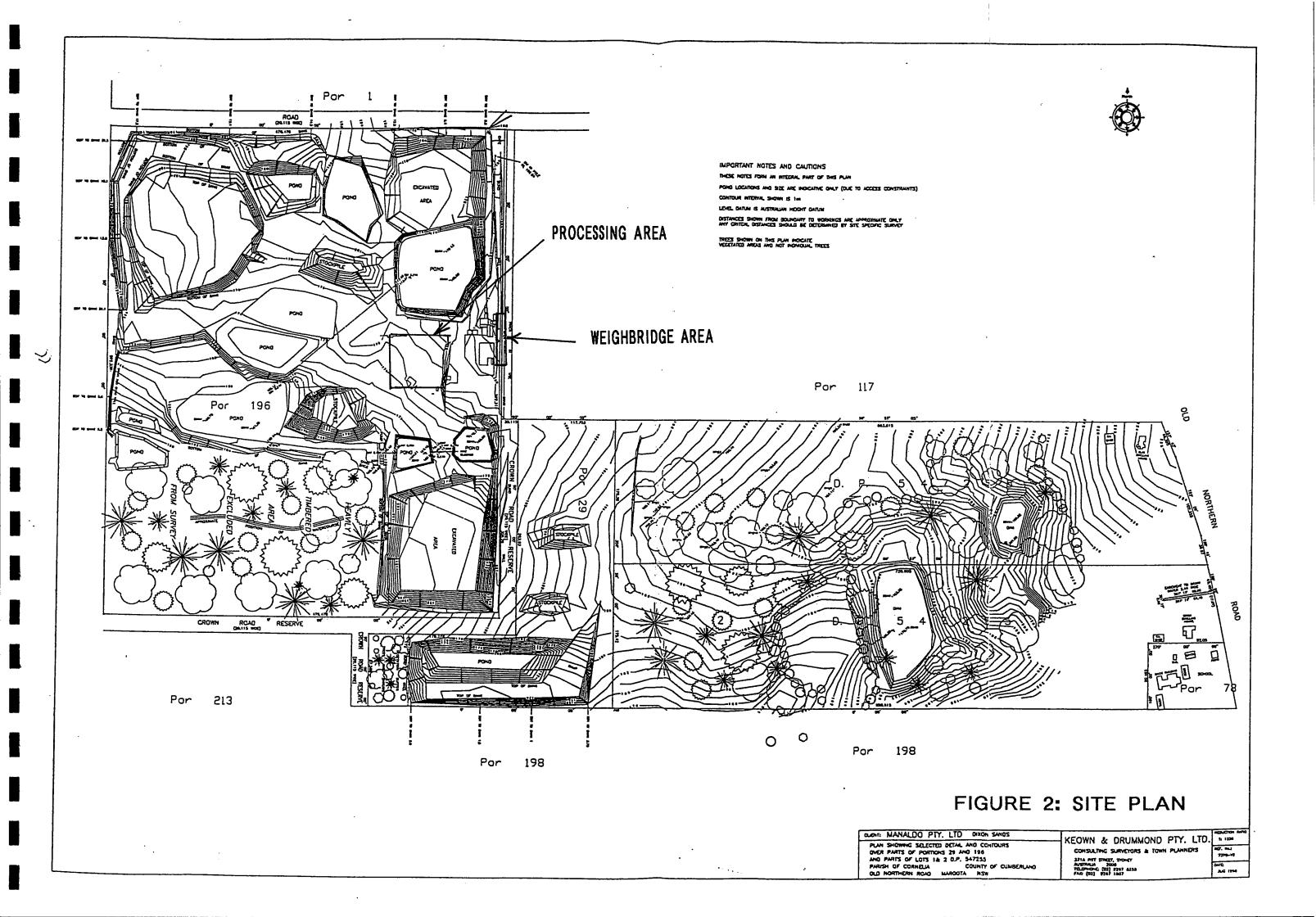
#### Adjustment for duration

Applied where a single – event noise is continuous for a period of less than two and a half hours in any 24-hour period.

#### Suburban area

A suburban area as defined by the NSW EPA Draft Stationary Noise Source Policy is an area defined as rural, rural – residential or residential on an LEP that has local traffic with characteristically intermittent traffic flows or with some commerce or industry. This area often has the following characteristics:

- decreasing noise levels in the evening period (1800 2200); and/or
- evening ambient noise levels defined by the natural environment and infrequent human activity.



#### 3. ACOUSTIC CRITERIA

The noise emissions from the sand extraction and processing operations are required to satisfy specific Baulkham Hills Shire Council and NSW EPA acoustic criteria.

#### 3.1 BAULKHAM HILLS SHIRE COUNCIL DCP No. 500

Section 2.9 of DCP No. 500 outlines the acoustic criteria for extractive industries. The objectives of the criteria are:

- "• To maintain the acoustic quality of the Shire;
- To protect and maintain the acoustic environment of residents, Public & Community facilities and other receivers in the Shire; and
- To limit the potential offensiveness of noise from specific sources."

The key prescriptive measures outlined in Section 2.9 include:

- "• Proponents should ensure that the maximum average noise emission level of extraction is no more than 5 dB(A) above maximum average background noise levels:
- Extraction activities should not occur within 100 metres of a residence not associated with the activities;
- Proponents should ensure that noise emissions meet all minimum acoustic standards defined in Chapters 19, 20 and 21 of the Environmental Noise Control Manual, 1994"

#### 3.2 EXISTING NSW EPA ASSESSMENT CRITERIA

The EPA has overall responsibility for setting noise quality objectives from industrial premises. The primary aim of environmental noise control is to minimise the occurrence of offensive noise in the community. It is considered that to be both effective and equitable, the determination and application of environmental noise control must take into account many factors, including:-

- the variation in response between individuals to any noise;
- the inherently noisy characteristics of many activities;
- the circumstances within which noise occurs;
- potential for annoyance and reduction in acoustic amenity;
- the technical and economic feasibility for noise control, and;
- social worth of the activity.

The broad environmental noise objectives are two-fold:

- (i) that noise from any single source does not intrude greatly above the prevailing background noise level; and
- (ii) that the background noise level does not exceed the level appropriate for a particular locality or land use.

January, 99

The normal EPA noise criteria for continuous industrial type noise are stated in Table 3.1. The criteria of most relevance to the proposed quarry are shown in bold.

Table 3.1 : Re	commended Oi	idoo: Background	Voise Levels
Predominant Land use of Receiver Area	Time Period	L <sub>Aso</sub> Background Acceptable Limit	Noise levels (dB(A)) Extreme Limit
Residential, Rural (approx R1 AS1055)	Day Night	45 35	50 40
Residential, Church, Hospital, School (approx R1-R2 AS1055)	Day Night	45 35	50 40
Residential, Church, Hospital, School - near busy road or industry (approx R2- R3 AS1055)	Day Night	50 40	55 45

Source:

**EPA Environmental Noise Control Manual** 

NOTE:

From Monday to Saturday, daytime is defined as 7.00 am to 10.00 pm and night time is 10.00 pm to 7.00 am. On Sundays and Public Holidays daytime is 8.00 am to 10.00 pm and night time is 10.00 pm

to 8.00 am.

In order to ensure that environmental noise levels do not steadily increase above the recommended outdoor background noise levels set out in Table 3.1, the manual sets out criteria for the formulation of design objectives based on the measured existing background noise level. Table 20 - 1 of the Environmental Noise Control Manual is reproduced in Table 3.2 below.

Table 3.2: Recomme	nded Planning Levels
Existing background noise level at the most sensitive point in an affected residential area	Recommended maximum noise level, for planning approval purposes, at that point as a result of a proposed new noise source
A. Background is above relevant acceptable level	<ul> <li>preferably, set maximum planning level 10 dB(A) or more below acceptable level</li> <li>at least, set maximum planning level 10 dB(A) below existing background level</li> </ul>
B. Background is at acceptable level	- set maximum planning level 10 dB(A) below acceptable level
C. Background is below acceptable level by 1 dB(A) 2 dB(A) 3 dB(A) 4 dB(A) 5 dB(A) 6 dB(A) or more	- set maximum planning level 9 dB(A) below acceptable level 5 dB(A) below acceptable level 3 dB(A) below acceptable level 2 dB(A) below acceptable level 2 dB(A) below acceptable level 5 dB(A) above background level

#### 3.2.1 Sleep Disturbance

The emission of peak noise levels for an instant or very short time period may cause sleep disturbance to residents. A method accepted by the EPA is to limit these extreme levels of noise to below 15 dB(A) above the measured  $L_{A90}$  level.

January, 99

#### 3.3 NSW EPA DRAFT STATIONARY NOISE SOURCE POLICY

The NSW EPA released its Draft Stationary Noise Source Policy in July, 1998. The policy will eventually replace the existing guidelines set out in the NSW EPA Environmental Noise Control Manual.

The new policy is aimed at assessing noise sources scheduled under the new Protection of the Environment Operations Act, 1998. However, the policy may also be used by local government to assess noise from stationary sources.

Stationary noise sources, as defined in the draft policy, are: "Sources that do not generally move from place to place, eg. Industrial or commercial sources. In general these include:

- ⇒ Individual stationary sources such as:
  - heating, ventilating and air conditioning equipment;
  - rotating machinery;
  - impacting mechanical sources;
  - other mechanical equipment and machinery such as conveyors
- ⇒ Mobile sources confined to a particular location such as draglines and haul trucks
- ⇒ Facilities, usually comprising many sources of sound, including:
  - industrial premises:
  - extractive industries
  - commercial premises
  - warehousing facilities
  - maintenance and repair facilities

(In this case, stationary source is understood to encompass all the activities taking place within the property boundary of the facility)"

The draft policy assesses noise using two components:

- controlling intrusive noise impacts in the short term
- maintaining noise level amenity for particular land uses in the long term.

The intrusiveness criterion can be summarised as:

L<sub>A10, 15 minute</sub> ≤ Rating Background Level + 5 - K

#### Where:

L<sub>A10, 15 minute</sub>

Represents the average of the maximum A-weighted sound pressure levels of the source over 15 minutes. This is to be assessed at the most affected residential boundary, or, if that is more than 30 metres from the residence, at the most affected point within 30 metres of the residence.

#### Rating Background Level

The background level to be used for assessment purposes. This is determined in Section 3 of this report.

Adjustment for character of noise as specified in Table 4.1 of the Draft Policy. This factor includes penalties for tonal noise, low frequency noise, impulsive noise, fluctuating or intermittent noise or single event noise. The maximum adjustment that can be applied is 10 dB(A).

The amenity criterion is determined using Tables 2.1 and 2.2 of the Draft Policy. Tables 3.3 and 3.4 below, summarise the criteria that apply to this development.

Table 3.3: Amenity Criteria Recommended maximum L <sub>Aeq</sub> noise levels from stationary noise sources ⊯								
Type of Receiver	Area	Time of Day	Recommended Maximum L <sub>Aeq</sub> Noise Level (RML) (dB(A))					
Residence	Suburban	Day	55					
		Evening	45					
		Night	40					
School Classroom (internal)	All	Noisiest 1 hour period when in use	35					

Table 3.4: Modification to RML to account for existing level of stationary noise							
Total existing L <sub>Aeq</sub> noise level from stationary sources (dB(A))	Maximum L <sub>Aeq</sub> noise level for noise from new sources alone (dB(A))						
≥ RML + 2	If existing noise level is likely to decrease in future:  RML – 10  If existing noise level is unlikely to decrease in the future:  Existing level – 10						
RML + 1	RML – 9						
RML	RML 8						
RML 1	RML 6						
RML – 2	RML – 4						
RML – 3	RML – 3						
RML – 4	RML – 2						
RML – 5	RML – 2						
RML – 6	RML –1						
< RML - 6	RML						

The existing  $L_{\mbox{\tiny Aeq}}$  noise levels from stationary noise sources are determined in Section 4 of the report.

#### 3.4 Existing Traffic Noise Criteria

#### 3.4.1 NSW EPA Traffic Noise Criteria

The existing NSW EPA road traffic noise criteria is setout in Chapter 157 of the Environmental Noise Control Manual.

 $L_{A10.18 \text{ hour}} = 63 \text{ dB(A)}$ 

For existing roadways an L<sub>Aea</sub> (24 hour) of 60 dB(A) is applied.

The above criteria do not allow for hourly fluctuations in noise over short time periods such as 2-3 hours or where  $L_{Aeq}$  levels exceed current guidelines. Another criteria should therefore be applied that can take into account hourly fluctuations in noise. This is best assessed by determining the  $L_{Aeq}$  for the time period in question and comparing increases/decreases that result from truck movements. An accepted approach is to limit the increase in the hourly  $L_{Aeq}$  due to a single development to 2 dB(A). This approach has therefore been adopted for this study.

#### 3.4.2 RTA Interim Traffic Noise Policy

In September, 1992, the RTA released it's Interim Traffic Noise Policy. The road traffic noise objectives outlined in the policy include:

 $L_{Aeq,24hr} = 60 dB(A)$  in residential areas

 $L_{Aeq,8hr}$  = 55 dB(A) between 10pm and 6am in residential areas

 $L_{Aeq,1hr}$  = 45 dB(A) between 8.30am and 3.30pm for classrooms in educational institutions.

#### 3.5 PROPOSED ROAD TRAFFIC NOISE CRITERIA

Table 1 of the NSW EPA Draft Environmental Criteria for Road Traffic Noise sets out the road traffic noise criteria for proposed road or residential land use developments. The criteria that apply to this study are as follows:

New land use developments with potential to create additional traffic on existing freeways / arterials

Day:

 $L_{Aeq(15hr)} = 60 dB(A)$ 

Night:

 $L_{Aeq(9hr)} = 55 dB(A)$ 

Where the criteria are already exceeded, the table states:

"Where feasible, existing noise levels should be mitigated to meet the noise criteria. Examples of applicable strategies include appropriate location of private access roads, times of use, use of clustering, use of 'quiet' vehicles, and use of barriers and acoustic treatments.

In all cases, traffic arising from the development should not lead to an increase in existing noise levels of more than 2 dB(A)."

Table 2 of the Draft Criteria sets out the criterion for existing school classrooms as:

 $L_{Aeq(1hr)} = 45 dB(A)$  (Internal)

#### 4. EXISTING ACOUSTIC ENVIRONMENT

### 4.1 MONITORING LOCATIONS AND METHODOLOGY

Existing background noise levels for the site was measured at the following three locations (refer to Figure 1):-

**Location A:** Residence at 169 Old Northern Road, Maroota. This residence is located approximately 550 metres to the east of the closest point on the site boundary. The measurement point was located approximately 10 metres from the house.

**Location B:** Residence at 167 Old Northern Road, Maroota. This residence is located approximately 700 metres to the east of the closest point on the site boundary. The measurement point was located approximately 15 metres from the house.

**Location C:** Maroota North Public School. The measurement point was located to the west of the closest classroom to the site boundary. This point was approximately 650 metres to the east of the nearest point of the boundary of the site.

Existing traffic noise levels along Old Northern Road and Wisemans Ferry Road were measured at the following four locations (refer to Figure 1):

**Location D:** Residence at 165A Old Northern Road, Maroota. This residence is located on the eastern side of Old Northern Road and is setback approximately 50 metres from the road. Due to security reasons, the logger was placed approximately 10 metres from the road in a free-field position.

January, 99

Location E: Residence at Lot 1 Old Northern Road, Maroota. This residence is located close to the intersection of Old Northern Road and Wisemans Ferry Road. The residence is setback approximately 55 metres from both roads. The logger was positioned approximately 20 metres from Old Northern Road and 50 metres from Wisemans Ferry Road in a free-field location.

**Location F:** Residence at Maroota Motors Pty Ltd, Corner of Old Northern Road and Roberts Road, Maroota. This residence is setback approximately 20 metres from Old Northern Road. The logger was placed within 0.5 metres from the front façade of the building.

**Location G:** Residence at the corner of Wisemans ferry Road and Haerses Road, Maroota. This residence is setback approximately 25 metres from Wisemans Ferry Road. The logger was positioned within 0.5 metres of the front façade of the building.

At all of the above locations measurements were carried out using a statistical Environmental Noise Logger, type EL-215. The loggers were set to monitor noise levels continuously over 15 minute statistical intervals for a period of eleven days. The logger at Location C (Maroota Public School) was set at 60 minute statistical intervals as the NSW EPA criteria is based on  $L_{\text{Aeq,1hr}}$  noise levels. The instrument sets were calibrated using a Bruel & Kjaer type 4230 acoustic calibrator before and after the measurement period to ensure the reliability and accuracy of the instruments. Wind socks were applied to the microphones, which were set at 1.2 meters above the ground at each location.

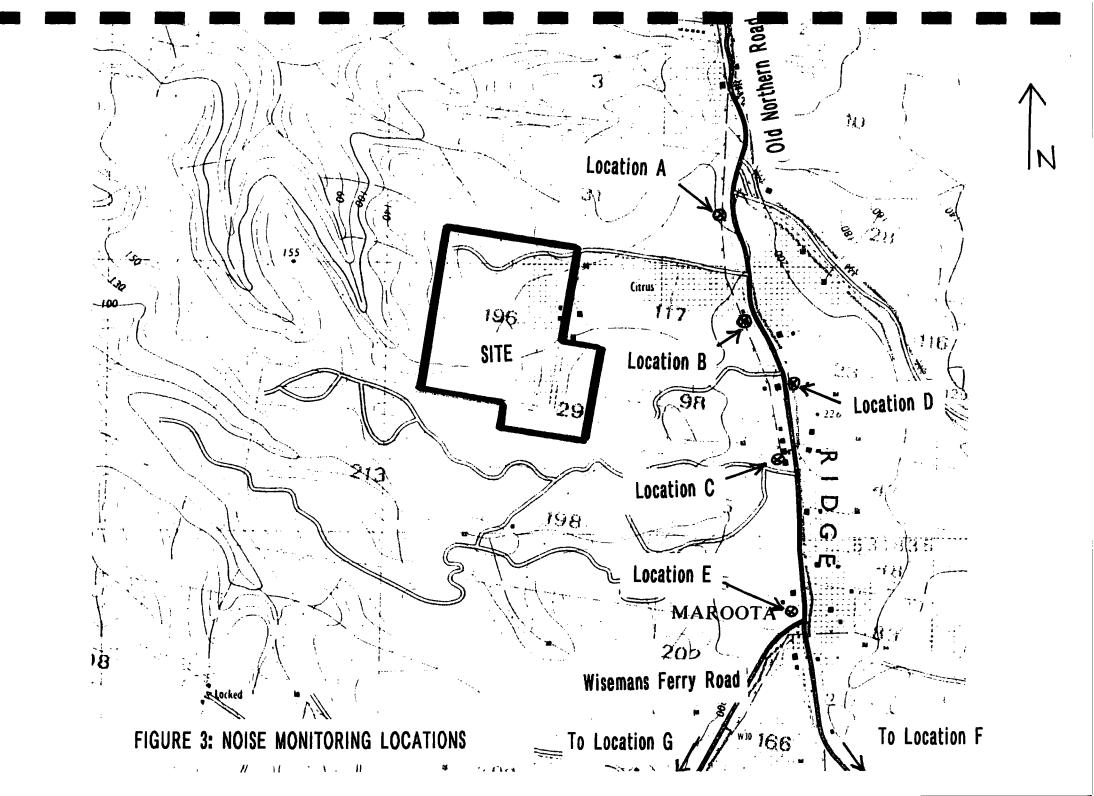
There were no excessive variances observed in the reference signal between the pre-measurement and post-measurement calibration.

A weather logger was established in an open area approximately 20 metres from the amenities buildings on the Dixon Sand site. The weather logger monitored wind speed and direction, rainfall and temperature during the noise monitoring period.

There were four periods when average wind speed (in excess of 5 m/s) or rainfall could have resulted in adverse noise monitoring conditions. These periods were:

a)	Sunday, 22/11/98 between 11am and 1.30pm	Excess wind
b)	Monday, 23/11/98 between 2pm and 5pm	Rainfall
c)	Wednesday, 25/11/98 between 9.30pm and 5.00am	Rainfall
d)	Thursday, 26/11/98 between 12pm and 1pm	Rainfall

Noise monitoring results were excluded from the statistical analysis at all locations during the adverse weather periods.



#### 4.2 Noise Monitoring Results

The results of the noise monitoring are presented in the following sections. The purpose of the monitoring at Locations A, B and C was to assess background noise levels for the stationary noise source operations on the site. Therefore, the statistical analysis includes measured  $L_{A10}$ ,  $L_{Aeq}$ , and  $L_{A90}$  noise levels during the periods of proposed site operations. This includes the day period, 7am to 6pm, and the shoulder period, 6am to 7am. The statistical analysis for Location C includes the 8am to 4pm period on weekdays only as the school does not operate outside these hours.

The purpose of the noise monitoring at Locations D, E, F and G was to determine existing road traffic noise levels. Therefore the statistical analysis includes  $L_{A10,18hr}$ ,  $L_{Aeq,,8hr}$ ,  $L_{Aeq,9hr}$ ,  $L_{Aeq,15hr}$ , and  $L_{Aeq,24hr}$  noise levels.

The results of the monitoring are presented graphically in the attachments.

#### 4.2.1 Location A

Ta	ible 4.1: Ma			olse Levels	-Location	A PLEASURE			
Date									
	Average	Average	ABL	Average	Average	ABL			
	L <sub>A10</sub>	L <sub>Aeq</sub> ¹	L <sub>A90</sub>	L <sub>A10</sub>	L <sub>Aeq</sub> 1	L <sub>A90</sub>			
Friday 20/11/98	-	-	-	59.7	55.3	38.3			
Saturday 21/11/98	57.8	55.8	36.4	60.1	56.9	35.0			
Sunday 22/11/98	49.8	48.2	28.2	63.3	62.7	36.0			
Monday 23/11/98	59.6	55.4	37.6	59.3	55.3	36.2			
Tuesday 24/11/98	58.8	53.9	36.0	58.5	54.3	39.5			
Wednesday 25/11/98	59.4	55.2	42.7	59.1	54.9	42.5			
Thursday 26/11/98	59.5	54.7	38.8	59.4	55.0	39.2			
Friday 27/11/98	59,4	55.2	39.4	59.6	55.8	38.5			
Saturday 28/11/98	58.8	55.9	47.6	59.4	55.3	42.7			
Sunday 29/11/98	52.1	49.4	29.3	59.1	55.9	33.0			
Monday 30/11/98	59.3	55.7	41.3	59.4	55.7	41.2			
Median <sup>2</sup>	59.3	55.3	39.1 ³	59.4	55.3	39.2 <sup>3</sup>			

- 1
- Average  $L_{\text{Aeq}}$  is calculated using a logarithmic average Median values are calculated for Monday to Saturday only as the site will not 2 operate on Sundays.
- 3 Median ABL is referred to as the Rating Background Level (RBL)

#### 4.2.2 Location B

Te	Table 4.2: Measured Background Noise Levels — Location B (dB(A))							
Date								
	Average L <sub>A10</sub>	Average L <sub>Aeq</sub> 1	ABL L <sub>A90</sub>	Average L <sub>A10</sub>	Average L <sub>Aeq</sub> 1	ABL L <sub>A90</sub>		
Friday 20/11/98	-	-	- 730	58.8	55.9	39.2		
Saturday 21/11/98	55.5	54.0	35.0	60.0	58.3	38.2		
Sunday 22/11/98	51.5	51.6	31.5	60.0	58.1	39.0		
Monday 23/11/98	60.5	57.6	35.1	58.5	57.2	36.5		
Tuesday 24/11/98	60.0	57.3	34.6	59.5	58.1	37.7		
Wednesday 25/11/98	59.9	56.8	39.0	60.3	59.0	40.2		
Thursday 26/11/98	60.5	57.5	37.5	59.6	57.8	38.0		
Friday 27/11/98	61.1	58.4	40.7	60.6	58.9	39.5		
Saturday 28/11/98	57.8	56.2	41.8	59.8	58.5	43.2		
Sunday 29/11/98	51.9	52.2	31.0	58.4	56.5	36.5		
Monday 30/11/98	59.1	56.5	37.5	59.4	58.0	42.0		
Median <sup>2</sup>	59.9	57.1	37.5 <sup>3</sup>	59.6	58.1	39.2 <sup>3</sup>		

<sup>1</sup> 

Average  $L_{\text{Aeq}}$  is calculated using a logarithmic average Median values are calculated for Monday to Saturday only as the site will not 2 operate on Sundays.

Median ABL is referred to as the Rating Background Level (RBL) 3

#### 4.2.3 Location C

Table 4.3	Measured Backgro	und Noise Levels – ⊾c	
Date		3(A)), A. A. B. Barner hool Period (8am – 4pr	<u> </u>
	Average L <sub>A10</sub>	Average L <sub>Aeq</sub> 1	ABL L <sub>A90</sub>
Friday 20/11/98	53.0	49.5	39.5
Monday 23/11/98	53.6	54.3	35.1
Tuesday 24/11/98	61.9	65.1	40.1
Wednesday 25/11/98	65.1	63.5	40.1
Thursday 26/11/98	58.5	60.0	37.0
Friday 27/11/98	68.6	66.5	37.9
Median <sup>2</sup>	60.2	61.8	38.7 ³

- Average  $L_{\mbox{\tiny Aeq}}$  is calculated using a logarithmic average Median values are calculated for Monday to Friday only as the school does 2 not operate on weekends.
- Median ABL is referred to as the Rating Background Level (RBL) 3

#### 4.2.4 Location D

	ile 4.4: Measu	red Backgro	ind Noise Lev	∕els—Locatio	hD 🕭
Date	L <sub>A10,18hr</sub>	L <sub>Aeq,8hr</sub>	L <sub>Aeq,9hr</sub>	L <sub>Aeq,15hr</sub>	L <sub>Aeq,24hr</sub>
Friday 20/11/98	51.0	45.8	45.8	49.8	48.8
Saturday 21/11/98	60.0	43.5	44.8	59.1	53.7
Sunday 22/11/98	58.6	42.6	43.9	58.5	53.0
Monday 23/11/98	53.0	42.0	43.7	52.1	49.0
Tuesday 24/11/98	56.0	42.5	44.2	54.6	50.7
Wednesday 25/11/98	56.1	43.0	44.1	54.7	50.7
Thursday 26/11/98	54.3	46.5	47.2	52.5	50.5
Friday 27/11/98	58.8	44.7	45.8	57.4	53.0
Saturday 28/11/98	57.4	43.0	44.1	55.4	51.1
Sunday 29/11/98	55.5	41.5	42.1	54.9	50.1
Monday 30/11/98	57.4	39.1	40.6	56.7	50.6
Tuesday 1/12/98	-	39.6	39.6	-	39.6
Median <sup>1</sup>	58.6	45.3	46.6	57.4	53.1

<sup>1</sup> In accordance with NSW EPA guidelines, 2.5 dB(A) has been added to the median values to account for façade reflection in a free field position.

#### 4.2.5 Location E

Ţāb	ile 4.5: Measu	red Backgro	77 ( 77	vels — Locatio	
Date	L <sub>A10,18hr</sub>	L <sub>Aeq,8hr</sub>	L <sub>Aeq,9hr</sub>	L <sub>Aeq,15hr</sub>	L <sub>Aeq,24hr</sub>
Friday 20/11/98	59.1	52.6	52.6	56.6	55.7
Saturday 21/11/98	63.8	47.0	48.0	62.0	56.8
Sunday 22/11/98	63.4	46.3	46.6	62.2	56.3
Monday 23/11/98	58.1	46.2	47.6	56.2	52.9
Tuesday 24/11/98	60.6	46.1	47.4	58.8	54.5
Wednesday 25/11/98	62.4	47.4	48.8	60.2	55.9
Thursday 26/11/98	60.7	49.3	50.3	58.5	55.5
Friday 27/11/98	64.1	48.7	49.8	62.4	57.7
Saturday 28/11/98	63.2	47.1	48.3	60.9	56.2
Sunday 29/11/98	60.8	47.7	48.0	59.0	54.9
Monday 30/11/98	62.5	45.2	46.8	60.9	55.6
Tuesday 1/12/98	-	44.8	44.8	-	44.8
Median <sup>1</sup>	64.9	49.6	50.5	62.7	58.1

In accordance with NSW EPA guidelines, 2.5 dB(A) has been added to the median values to account for façade reflection in a free field position.

January, 99

4.2.6 Location F

Table 4.6: Measured Background Noise Levels – Location F							
Date	L <sub>A10,18hr</sub>	L <sub>Aeq,8hr</sub>	L <sub>Aeq,9hr</sub>	L <sub>Aeq,15hr</sub>	L <sub>Aeq,24hr</sub>		
Friday 20/11/98	54.3	48.7	48.7	54.0	52.7		
Saturday 21/11/98	57.4	47.0	48.1	56.5	53.4		
Sunday 22/11/98	56.7	46.3	47.3	55.3	52.3		
Monday 23/11/98	56.4	48.2	49.4	56.2	53.7		
Tuesday 24/11/98	56.0	49.4	50.4	55.9	53.8		
Wednesday 25/11/98	56.8	49.0	50.1	55.3	53.3		
Thursday 26/11/98	57.4	50.0	51.0	56.2	54.2		
Friday 27/11/98	56.4	47.8	49.2	55.4	53.0		
Saturday 28/11/98	57.1	48.1	49.1	54.4	52.4		
Sunday 29/11/98	54.8	44.0	44.5	54.8	50.9		
Monday 30/11/98	54.8	46.4	47.8	54.5	52.0		
Tuesday 1/12/98	<u>-</u>	47.6	47.6	-	47.6		
Median	56.4	48.0	48.9	55.3	52.9		

## 4.2.7 Location G

Table 4.7: Measured Background Noise Levels – Location G. (dB(A))							
Date	L <sub>A10,18hr</sub>	L <sub>Aeq,8hr</sub>	L <sub>Aeq,9hr</sub>	L <sub>Aeq,15hr</sub>	L <sub>Aeq,24hr</sub>		
Friday 20/11/98	50.0	44.3	44.3	53.5	51.2		
Saturday 21/11/98	57.0	46.3	47.4	55.2	52.3		
Sunday 22/11/98	54.7	44.1	45.2	54.6	51.0		
Monday 23/11/98	54.2	45.8	47.1	55.3	52.2		
Tuesday 24/11/98	53.7	45.5	46.8	54.8	51.8		
Wednesday 25/11/98	54.9	45.6	46.9	55.1	52.0		
Thursday 26/11/98	55.2	47.8	48.9	56.2	53.5		
Friday 27/11/98	57.5	46.1	47.5	56.4	53.1		
Saturday 28/11/98	55.6	48.1	48.9	55.9	53.3		
Sunday 29/11/98	54.4	46.2	46.7	54.3	51.5		
Monday 30/11/98	53.3	45.7	47.2	55.1	52.1		
Tuesday 1/12/98	-	48.4	48.4	-	48.4		
Median	54.7	45.9	47.1	55.1	52.1		

#### 4.2.8 Comments

#### Locations A and B

The RBL for both periods are below the recommended outdoor background noise levels set out in the Environmental Noise Control Manual for both locations. Observations during logger establishment found that the primary sources of noise at both locations were road traffic noise, agricultural noise and noise from dogs barking. Noise from the Dixon Sand quarry and adjacent quarries was inaudible.

The noise logger graphs presented in the attachments show several periods of excessive noise measurement results. For example the midday period on the  $22^{nd}$  of November at Location A shows repeated  $L_{A90}$  noise levels above 60 dB(A). However, weather logger data for this period shows high rainfall and wind activity.

Other periods of short term elevations in the ambient noise levels at Locations A and B can be attributed to noise from agricultural machinery and lawn mowers. A water pump was audible during the logger establishment at Location A. The resident at this location indicated that the pump operates for approximately one hour every third or fourth day. Noise from the pump could also have influenced the measured noise levels.

Discussions with the residents at these locations found that the quarries are seldom, if ever, audible. However, truck noise on the Dixon Sand and adjacent quarry access roads were a cause for concern for both residents.

#### Location C

Measured noise levels at the school were primarily influenced by noise from the students and road traffic noise. The quarries in the area surrounding the school were inaudible during observations. Discussions with the school principal found that the noise from the operations at the quarries were rarely audible. However noise levels from trucks travelling along Old Northern Road were a cause for concern.

#### Locations D, E, F and G

Measured noise levels at these locations were primarily influenced by road traffic noise. The median noise levels are well below the current and proposed objectives for arterial roads. However, the noise logger graphs presented in the attachments shows that the measured  $L_{\text{Aeq}}$  regularly exceeds 55 dB(A) during the 7am – 6pm period. The criterion for local roads, as outlined in the NSW EPA Draft Environmental Criteria for Road Traffic Noise, is an  $L_{\text{Aeq,1hr}}$  of 55 dB(A) during the daytime. Whilst neither Old Northem Road or Wisemans Ferry Road could be considered local roads; measured  $L_{\text{Aeq}}$  noise levels exceeding 55 dB(A) for extended periods of time could have the potential for annoyance. The potential for annoyance is amplified by the prevalence of low background noise levels resulting in minimal masking of traffic noise.

These assumptions are verified by discussions with residents that revealed traffic noise is a major concern.

The criteria setout in the NSW EPA and RTA guidelines involves averaging noise levels over 15 or 18 hour periods during the daytime. This criteria may not adequately protect the amenity of residents along Old Northern Road and Wisemans Ferry Road where traffic volumes are high during the 6am to 6pm period only. Therefore, as outlined in Section 3, the objective that will be used to assess traffic noise impacts for this study will be to limit the hourly increase in  $L_{\text{Aeq}}$  noise levels to not more than 2 dB(A) above existing  $L_{\text{Aeq}}$  noise levels.

# 4.3 SITE NOISE DESIGN OBJECTIVES

Noise design objectives for the noise emissions from the sand extraction and processing operations can now be formulated based on the measured background noise levels and the criteria set out in the existing and proposed NSW EPA guidelines.

# 4.3.1 Existing Criteria

#### Location A

Based on the existing guidelines outlined in the NSW EPA Environmental Noise Control Manual, the following design objectives should be adopted:

## Shoulder Period (6am to 7am)

Measured RBL = 39.1 dB(A)

Recommended outdoor background noise level = 35 dB(A)

Therefore  $L_{A10}$  noise levels should not exceed 29 dB(A) at Location A.

### Day time period (7am - 6pm)

Measured RBL = 39.2 dB(A)

Recommended outdoor background noise level = 45 dB(A)

Therefore  $L_{A10}$  noise levels should not exceed 44 dB(A) at Location A.

#### Location B

Based on the existing guidelines outlined in the NSW EPA Environmental Noise Control Manual, the following design objectives should be adopted:

#### Shoulder Period (6am to 7am)

Measured RBL = 37.5 dB(A)

Recommended outdoor background noise level = 35 dB(A)

Therefore  $L_{A10}$  noise levels should not exceed 27 dB(A) at Location B.

#### Day time period (7am - 6pm)

Measured RBL = 39.2 dB(A)

Recommended outdoor background noise level = 45 dB(A)

Therefore  $L_{A10}$  noise levels should not exceed 44 dB(A) at Location B.

### **Location C**

Based on the existing guidelines outlined in the NSW EPA Environmental Noise Control Manual, the following design objectives should be adopted:

Day time period (8am - 4pm)

Measured RBL = 38.7 dB(A)

Recommended outdoor background noise level = 45 dB(A)

Therefore  $L_{A10}$  noise levels should not exceed 43 dB(A) at Location C.

## 4.3.2 Proposed Criteria

## **Location A**

Based on the proposed guidelines outlined in the NSW EPA Draft Stationary Noise Source Policy, the following design objectives should be adopted:

# Shoulder Period (6am to 7am)

For the intrusive criterion:

Measured RBL = 39.1 dB(A)

Therefore  $L_{A10}$  noise levels should not exceed 44 dB(A) at Location A.

#### For the amenity criterion:

The existing  $L_{Aeq}$  from stationary noise sources alone needs to be calculated. However, the design objective for the maximum  $L_{Aeq}$  noise level from the site could not be lower than the RML – 10 dB(A). This equates to 45 dB(A) for a suburban area. Therefore, the intrusive criterion is the limiting criterion.

Day time period (7am - 6pm)

For the intrusive criterion:

Measured RBL = 39.2 dB(A)

Therefore  $L_{A10}$  noise levels should not exceed 44 dB(Å) at Location A.

For the amenity criterion:

The existing  $L_{Aeq}$  from stationary noise sources alone needs to be calculated. However, the design objective for the maximum  $L_{Aeq}$  noise level from the site could not be lower than the RML – 10 dB(A). This equates to 45 dB(A) for a suburban area. Therefore, the intrusive criterion is the limiting criterion.

### **Location B**

Based on the proposed guidelines outlined in the NSW EPA Draft Stationary Noise Source Policy, the following design objectives should be adopted:

# Shoulder Period (6am to 7am)

For the intrusive criterion:

Measured RBL = 37.5 dB(A)

Therefore L<sub>A10</sub> noise levels should not exceed 42 dB(A) at Location B.

## For the amenity criterion:

The existing  $L_{Aeq}$  from stationary noise sources alone needs to be calculated. However, the design objective for the maximum  $L_{Aeq}$  noise design objective for the site could not be lower than the RML – 10 dB(A). This equates to 45 dB(A) for a suburban area. Therefore, the intrusive criterion is the limiting criterion.

Day time period (7am - 6pm)

For the intrusive criterion:

Measured RBL = 39.2 dB(A)

Therefore L<sub>A10</sub> noise levels should not exceed 44 dB(A) at Location B.

#### For the amenity criterion:

The existing  $L_{Aeq}$  from stationary noise sources alone needs to be calculated. However, the design objective for the maximum  $L_{Aeq}$  noise design objective for the site could not be lower than the RML – 10 dB(A). This equates to 45 dB(A) for a suburban area. Therefore, the intrusive criterion is the limiting criterion.

January, 99

## **Location C**

Based on the proposed guidelines outlined in the NSW EPA Draft Stationary Noise Source Policy, the following design objectives should be adopted:

# Day time period (8am - 4pm)

For the intrusive criterion: Measured RBL = 38.7 dB(A) Therefore  $L_{A10}$  noise levels should not exceed **43 dB(A)** at Location C.

## For the amenity criterion:

The existing  $L_{\text{Aeq}}$  from stationary noise sources alone needs to be calculated. However, due to the high measured  $L_{\text{Aeq}}$ , the intrusive criterion is expected to be the limiting criterion.

# 4.3.3 Summary of the design objectives

The site noise design objectives for each of the three locations are summarised in Table 4.8.

Table 4.8: Summary of Site Noise Design Objectives (dE(/s))							
Location	Existing Criteria  Maximum L <sub>A10</sub> noise level		Proposed Criteria Maximum L <sub>A10</sub> noise leve				
	6am – 7am	7am – 6pm	6am – 7am	7am – 6pm			
A 169 Old Northern Road	29	44	44	44			
B 167 Old Northern Road	27	44	42	44			
C Maroota Public School	•	43	-	43			

The design objectives for the shoulder period (6am – 7am) based on the existing criteria are overly conservative. The Draft Policy was prepared to address issues such as design objectives for shoulder periods (see Section 3.3 of the Draft Policy). Based on the measured noise levels and the observations during the site visits, it is considered that the design objectives for the proposed criteria will ensure that the acoustic amenity of nearby residents is adequately protected. Therefore, the objectives shown in bold in Table 4.8 will be used to assess noise emissions from the site.

It should be noted that the design objectives for the proposed criteria are based on the intrusive criteria as discussed in the previous sections and that no modification factor has been applied. Modifying factors are further discussed in the results of the noise predictions.

# 5. PREDICTED NOISE IMPACT

### 5.1 OPERATIONAL SITE NOISE

The proposed operations on site include the extraction and processing of sand. There are several operations with the potential to generate excessive noise.

A detailed summary of the plant layout, equipment specifications and processes is provided in the environmental impact statement for the development and therefore has not been reproduced in this report. However, the basic operations are described.

Extraction of sand is carried out using a dozer to rip through the sand and a scraper to extract the sand and transport it to the processing plant. The sand is then processed through either a wet or dry sieving system before being placed into stockpiles. Front end loaders (FELs) are used to load the sand into trucks for transport off site.

There is an existing wet and dry plant on site. This plant is both electric and diesel powered. Additional plant will be commissioned following development consent. The additional plant will be electric powered and will include crushers, sieves and conveyors. The main noise sources are located at ground level with some of the electric conveyors placed higher off the ground surface.

There are several auxiliary plant items including a water cart, grader, backhoe and water pump.

Noise source data was obtained from each of the mobile and stationary sources during normal operations. The measurements were carried out using a Rion NA27E Precision Sound Level Meter. The instrument was calibrated before and after use with a Rion calibrator. There were no significant variances between pre and post measurement reference signals. Weather conditions were satisfactory for noise measurement.

The noise source data is summarised in Table 5.1. The data will be used to model noise emissions from the site at the nearest sensitive receivers.

It was not possible to obtain accurate noise source data for the proposed additional plant. However, potential noise emissions from this plant are discussed further in Section 5.1.2.

			Tab		se Source I Power Lev					
Descriptor	dB(A)					Band Frequ			- a - a - a - a - a - a - a - a - a - a	100 100 100 100 100 100 100 100 100 100
		31.5	63	125	250	500	1000	2000	4000	8000
Caterpillar	637D Sc	raper		-						·
L <sub>A10</sub>	108.8	71.2	82.4	91.5	97.2	104.5	102.7	102.0	97.4	87.7
L <sub>Aea</sub>	106.3	68.7	80.2	89.5	94.3	101.4	101.0	99.4	94.5	83.9
Komatsu 5	00 Front	End Loade	er						-1	
L <sub>A10</sub>	104.7	62.5	88.6	87.3	95.6	99.0	99.9	97.3	90.7	83.0
L <sub>Aea</sub>	102.3	64.7	85.5	85.3	91.8	96.4	98.0	95.1	88.6	80.4
Komatsu 3	75 Dozei	r								
L <sub>A10</sub>	108.7	65.0	87.8	93.1	98.7	102.7	105.0	101.0	97.1	85.5
L <sub>Aeq</sub>	107.5	60.1	86.2	91.1	95.9	101.2	103.6	99.8	95.9	84.5
Case 580C	Backho	e								
L <sub>A10</sub>	106.6	76.3	84.0	91.6	94.7	97.8	101.6	100.8	97.2	94.9
L <sub>Aeq</sub>	105.2	74.2	82.7	90.5	93.9	96.9	100.1	99.2	95.1	92.5
Water Cart									<u></u>	-
L <sub>A10</sub>	100.6	74.2	85.5	90.2	89.3	92.8	95.7	93.2	90.6	83.6
L <sub>Aeq</sub>	98.8	73.1	83.0	88.4	87.7	91.0	94.3	91.0	87.6	80.6
Grader					_					
L <sub>A10</sub>	111.1	73.6	94.0	93.3	94.6	103.3	106.2	106.7	99.7	91.1
L <sub>Aeq</sub>	109.1	71.5	91.5	91.6	93.1	101.5	104.5	104.3	96.9	88.7
Road Trans	port Tru	ick							•	<del>1</del>
L <sub>A10</sub>	108.4	92.9	91.9	92.9	102.9	104.9	99.9	93.9	87.9	80.1

			· Table	5.1b: Noise	Source Da	ita – Station	arv Plant			
							ur i sa ka			
Descriptor	dB(A)							•		
		31.5	63	125	250	500	1000	2000	4000	8000
Dry Plant -	Crushe	r 1								<del> </del>
L <sub>A10</sub>	98.3	59.1	71.5	88.2	87.9	93.4	91.8	91.4	87.2	80.9
L <sub>Aeq</sub>	97.4	55.3	68.9	86.6	86.9	92.3	90.8	90.4	85.9	79.8
Dry Plant -	Crushei	r 2					<u> </u>	•	L.,	
L <sub>A10</sub>	101.4	58.3	75.8	86.2	87.9	91.9	97.3	95.9	93.0	85.3
L <sub>Aeq</sub>	101.1	56.6	75.2	85.4	87.4	91.3	96.8	95.5	92.5	84.9
Dry Plant -	Vibratin	g Screen 1							·	<u></u>
L <sub>A10</sub>	100.0	54.9	65.1	86.0	86.7	88.6	92.5	96.0	93.2	87.4
L <sub>Aeq</sub>	99.6	54.0	64.5	85.5	86.2	87.9	91.9	95.5	92.7	86.7
Dry Plant –	Screen	1 Conveyor	•				•		· · · · · · · · · · · · · · · · · · ·	<del></del>
L <sub>A10</sub>	82.8	48.1	49.6	62.5	69.7	74.2	80.9	74.4	69.3	59.6
L <sub>Aeq</sub>	82.1	36.9	47.9	60.9	67.5	72.8	80.2	73.3	68.5	58.1
Dry Plant R	C1 Conv	reyor							<del></del>	<u> </u>
L <sub>A10</sub>	82.6	48.1	54.9	61.4	62.2	71.8	75.6	77.3	78.0	70.9
L <sub>Aeq</sub>	79.5	43.8	53.1	60.2	61.2	68.0	72.8	73.5	74.7	69.0
Dry Plant S	tacker D	elivery Con	veyor							
L <sub>A10</sub>	87.7	54.1	66.1	68.9	72.8	76.1	86.4	80.5	77.0	68.6
L <sub>Aeq</sub>	86.3	50.2	63.5	66.1	70.8	75.0	84.9	76.3	73.5	64.6

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1944 - 194			Table 5.1	b (cont.): N	oise Sourc	a Data – Sta	tionary Plar	4		
Shield of the Art		in the second	4504564 A. A. T. W. L. W. D. F. W. W. W. C.	Sharper Control of the control of th	2 - 4 D N 3 ( 2000) N CO ( 10 CO ( 10 CO ) 10 CO ( 10 CO )	\$100,000 Feb. (200) (\$1.50 pt.) (\$1.50 pt.) (\$1.50 pt.) (\$1.50 pt.) (\$1.50 pt.)		BOOK TO THE REPORT OF THE PARTY		
Descriptor	dB(A)					Band Frequ		12		
		31.5	63	125	250	500	1000	2000	4000	8000
Dry Plant C	versize	Conveyor		-						
L <sub>A10</sub>	93.0	48.1	58.6	69.2	78.7	85.3	86.1	89.3	85.5	73.9
L <sub>Aeq</sub>	92.5	38.2	56.9	68.2	77.9	84.5	85.5	88.6	84.8	73.0
Dry Plant S	creen 3						· • · · · · · · · · · · · · · · · · · ·		•	
L <sub>A10</sub>	83.0	52.6	67.0	67.5	75.3	74.4	77.3	76.5	74.2	71.3
L <sub>Aeq</sub>	82.5	51.8	66.7	66.7	74.2	73.5	76.6	75.8	73.7	70.2
Wet Plant L	Dewatere	r							<del>*</del>	
L <sub>A10</sub>	82.4	48.1	56.1	62.4	70.9	76.5	76.8	75.8	72.7	66.8
L <sub>Aeq</sub>	80.2	44.9	54.7	60.8	69.5	74.7	74.2	73.6	70.8	65.1
Wet Plant D	)ewatere	r Delivery E	Belt							•
L <sub>A10</sub>	87.9	48.1	59.4	58.6	61.4	77.0	86.8	77.7	71.8	59.0
L <sub>Aeq</sub>	87.0	38.8	57.3	57.4	60.3	76.2	85.9	77.0	71.3	58.4
Wet Plant -	Scrubb	er								
L <sub>A10</sub>	85.7	48.1	67.6	71.3	74.9	79.8	79.0	79.8	78.2	73.6
$L_{Aeq}$	84.2	40.5	64.2	68.0	72.8	77.4	77.1	77.9	76.9	71.9
Water Pum	p									
L <sub>A10</sub>	104.3	88.6	87.9	90.3	86.8	100.1	99.9	96.3	91.3	80.5
L <sub>Aeq</sub>	103.8	88.3	87.3	89.7	86.0	99.2	99.0	95.8	90.7	79.7

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#### 5.1.1 Predicted Noise Levels

Noise level predictions for the proposed operations have been undertaken.

The predicted noise levels have been calculated on the following basis:

- Use of the environmental noise model ENM Version 3.06. This model is recommended by the NSW EPA for noise modelling.
- Ground contours developed from the site survey conducted by Keown & Drummond Pty Ltd and the CMA Topographic Map for Lower Portland (1:25,000).
- L<sub>A10</sub> octave band noise source data presented in Tables 5.1a and 5.1b. As discussed in Section 4, the intrusive criterion is the governing criterion and therefore L<sub>Aeq</sub> noise level predictions are not required.
- Meteorological conditions consisting of:
  - \* No wind for Scenarios 1A, 2A and 3A;
  - \* wind towards the east of 2 m/sec for Scenarios 1B, 2B and 3B;
  - \* moderate relative humidity and moderate air temperature;
  - \* stability class D;

providing neutral to slightly adverse conditions.

Three operational scenarios were simulated in the modelling. Scenario 1 represents normal extraction operations from Lot 196 and processing operations. Scenario 2 represents normal extraction operations from Lot 29 and processing operations. Scenario 3 represents worst case or peak operations including extraction from Lot 29, processing operations and auxiliary plant operations.

The noise sources and the locations of the sources for each Scenario are presented in Table 5.2 on the following page. All mobile equipment noise sources were modelled at the original or existing surface level, ie. No allowances for extraction working faces have been made.

Table 5.2: Noise source allocation for each modelling scenario					
Noise Source	Location				
Scenario 1 : Extraction in Lot 196					
All dry plant	Dry plant area				
Cat 637D scraper	South eastern area of Lot 196				
Cat 637D scraper	Processing hopper				
Komatsu 375 dozer	South eastern area of Lot 196				
Komatsu 500 FEL	Processed sand stockpiles				
Road transport truck	Processed sand stockpiles				
Road transport truck	Weighbridge				
Scenario 2: Extraction in Lot 29					
All dry plant	Dry plant area				
Cat 637D scraper	Centre of Lot 29				
Cat 637D scraper	Processing hopper				
Komatsu 375 dozer	Centre of Lot 29				
Komatsu 500 FEL	Processed sand stockpiles				
Road transport truck	Processed sand stockpiles				
Road transport truck	Weighbridge				
Scenario 3: Peak operations					
All dry plant	Dry plant area				
All wet plant	Wet plant area				
Cat 637D scraper	Centre of Lot 29				
Komatsu 375 dozer	Centre of Lot 29				
Komatsu 500 FEL	Processed sand stockpiles				
Road transport truck	Processed sand stockpiles				
Road transport truck	Weighbridge				
Water Cart	Haul road				
Grader	Haul road				
Water pump	Water retention pond				

The results of the point to point modelling are presented in Table 5.3.

Table 5.3	: Predicted Noise	Levels from Site Ope	erations
		B(A))	
Scenario	Location A	Location B	Location C
Design Objective	44.0	44.0	43.0
1A	32.5	39.2	34.2
1B	38.8	44.7	41.5
2A	33.0	43.7	40.7
2B	38.9	48.2	45 688
3A	34.1	46'0 1.4	41.3
3B	40.2	49.9	46.6**

The results shown shaded in Table 5.3 exceed the noise design objective for daytime operations. It can be seen that wind conditions strongly influence noise emissions. Although the modelling scenarios are based on peak operations and conservative modelling factors have been used, the results demonstrate that there is potential for adverse noise emissions if the operations are not adequately managed.

In order to reduce predicted noise emissions below the noise design objectives, the design of noise controls have been carried out. Using the ENM model, the effect of constructing several earth berms to the east of the extraction and operating areas have been assessed.

The following earth berms have been included in the noise model:

- ⇒ a 3 metre earth berm along the eastern boundary of Lot 29
- ⇒ a 2.5 metre earth berm along the northern boundary of Lot 29
- ⇒ an earth berm extending along the eastern boundary of Lot 196 from the northern boundary of Lot 29 (This berm has recently been formed and vegetated as part of the site rehabilitation plan and varies in height between 0.8 metres to 1.5 metres).
- a 1.5 metre earth berm extending along the western side of the access road from the weighbridge to the main site gate (This berm has already been formed and vegetated as part of the site rehabilitation plan and varies in height between 0.9 metres and 2 metres).

The figure on the following page shows the location of the proposed earth berms.

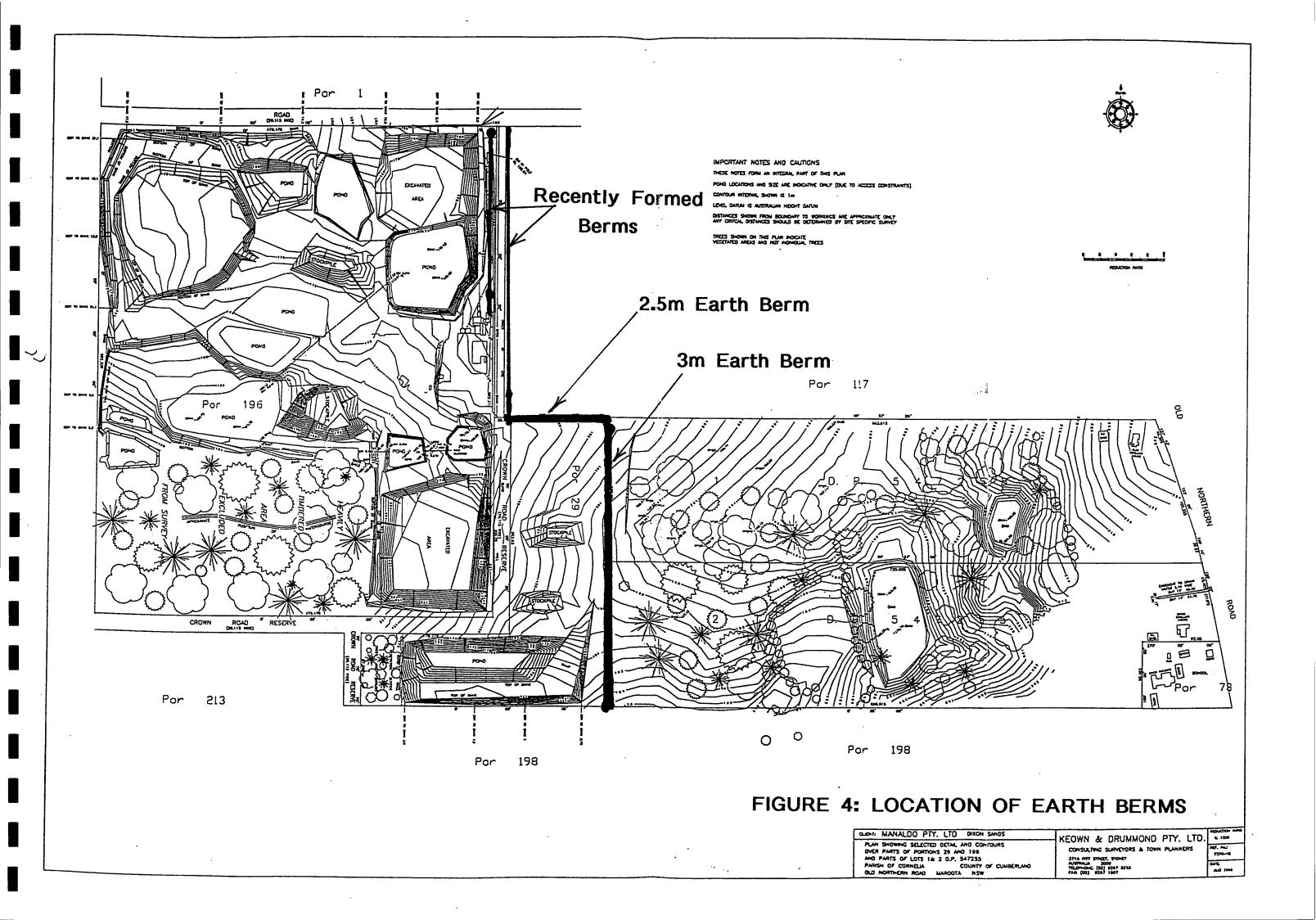
Point to point calculations were again carried out using the ENM model with the inclusion of the earth berms. The results of the revised modelling are presented in Table 5.4.

Table 5.4: Predicted Noise Levels from Site Operations with Earth Berms in place (dB(A))							
Scenario	Location A	Location B	Location C				
Design Objective	44.0	44.0	43.0				
1A	34.0	37.0	31.9				
1B	39.2	41.8	40.7				
2A	36.3	37.9	33.0				
2B	40.8	43.3	41.5				
3A	38.1	40.8	33.5				
3B	41.9	45.5	41.4				

The results presented in Table 5.4 demonstrate that, following the construction of the earth berms, noise emissions will comply with the noise design objectives for daytime operations. The 1.5 dB(A) exceedence for Scenario 3B at Location B is not considered significant. This scenario was for worst case operating conditions with a wind towards the residences. The modelling is based on maximum noise sources from all equipment operating simultaneously and therefore actual  $L_{\rm A10}$  noise levels at the residences can be expected to be less than the predicted values presented.

The predicted noise levels also comply with the noise design objectives for the shoulder period (6am – 7am) for all scenarios except Scenarios 2B and 3B. The noise design objective for the shoulder period is 43 dB(A) for Location B. During adverse wind conditions, this objective may be exceeded by 1.5 dB(A). However, the potential for adverse wind conditions to occur between the 6am to 7am period is minimal and an exceedence of 1.5 dB(A) is unlikely to cause annoyance.

Analysis of the ENM output files has found that contribution of noise from the mobile equipment significantly exceeds the contribution of noise from the stationary processing plant.



Noise contour plots were generated for each of the scenarios with the earth berms in place. The contour plots are overlaid upon the actual ground contours and demonstrate the effect of the noise controls.

January, 99

FIGURE 5 - Scenario 1A (earth berms included, no wind)

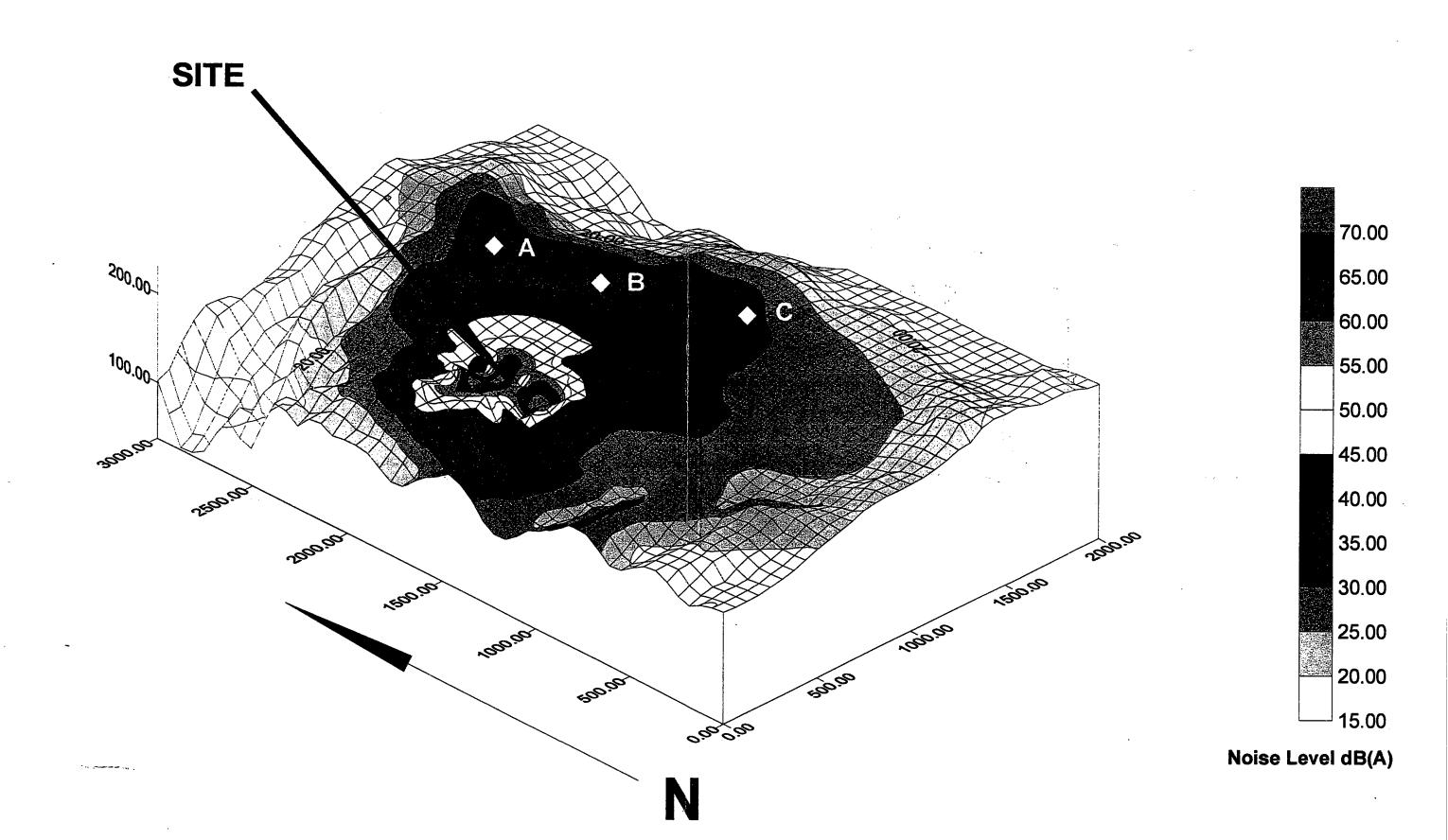


FIGURE 6 - Scenario 1B (earth berms included, 2m/s westerly wind)

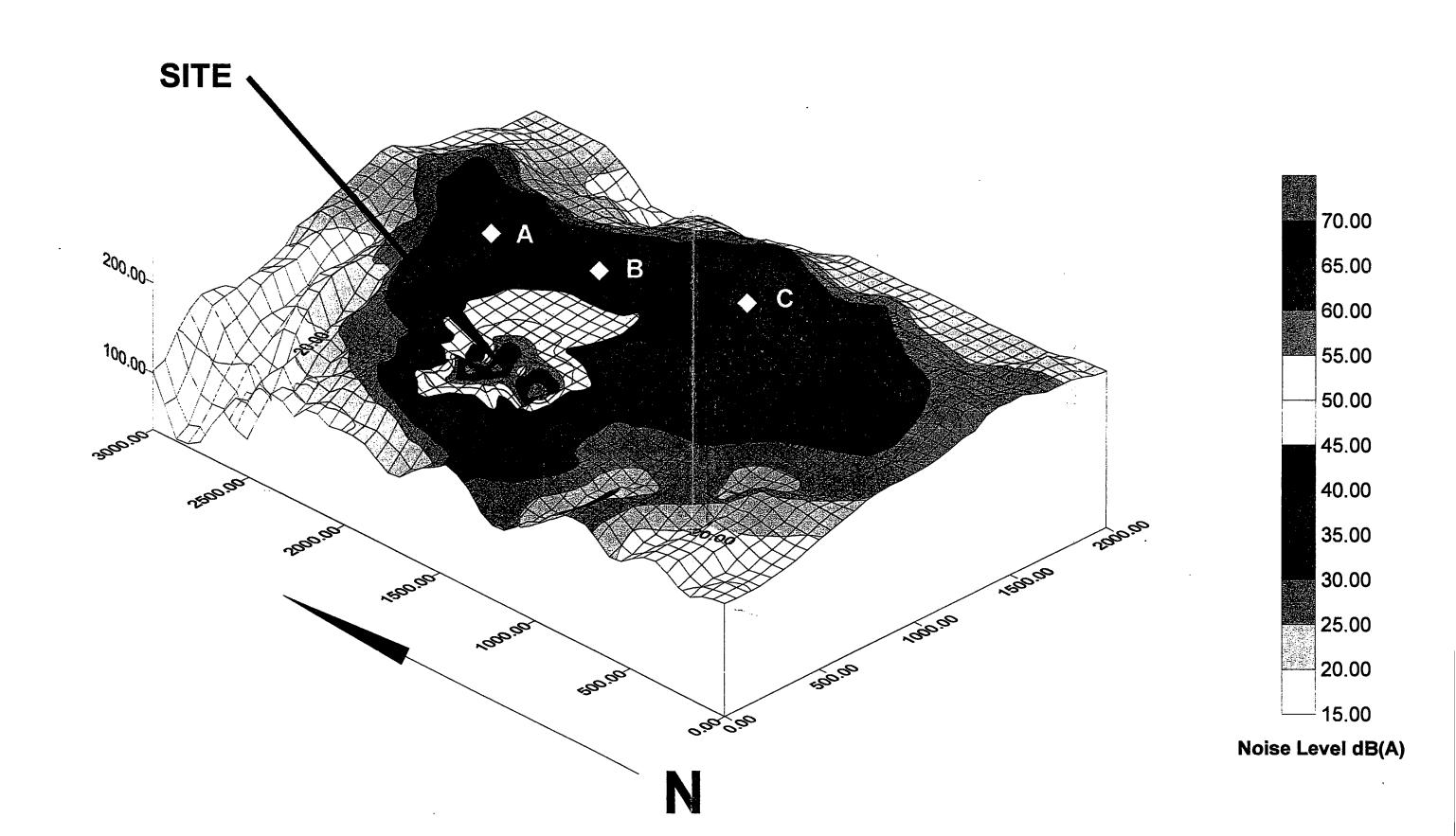


FIGURE 7 - Scenario 2A (earth berms included, no wind)

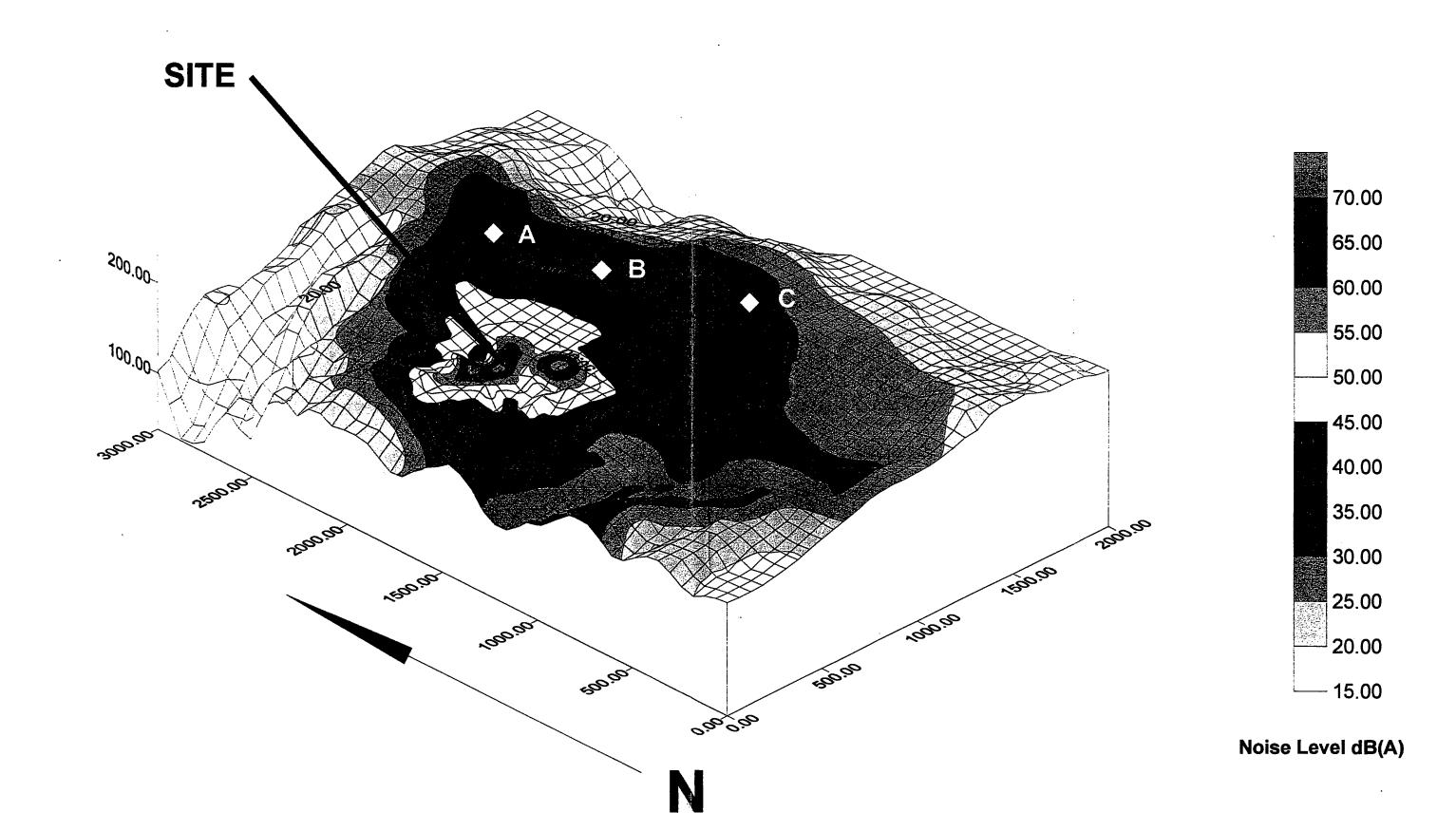


FIGURE 8 - Scenario 2B (earth berms included, 2m/s westerly wind)

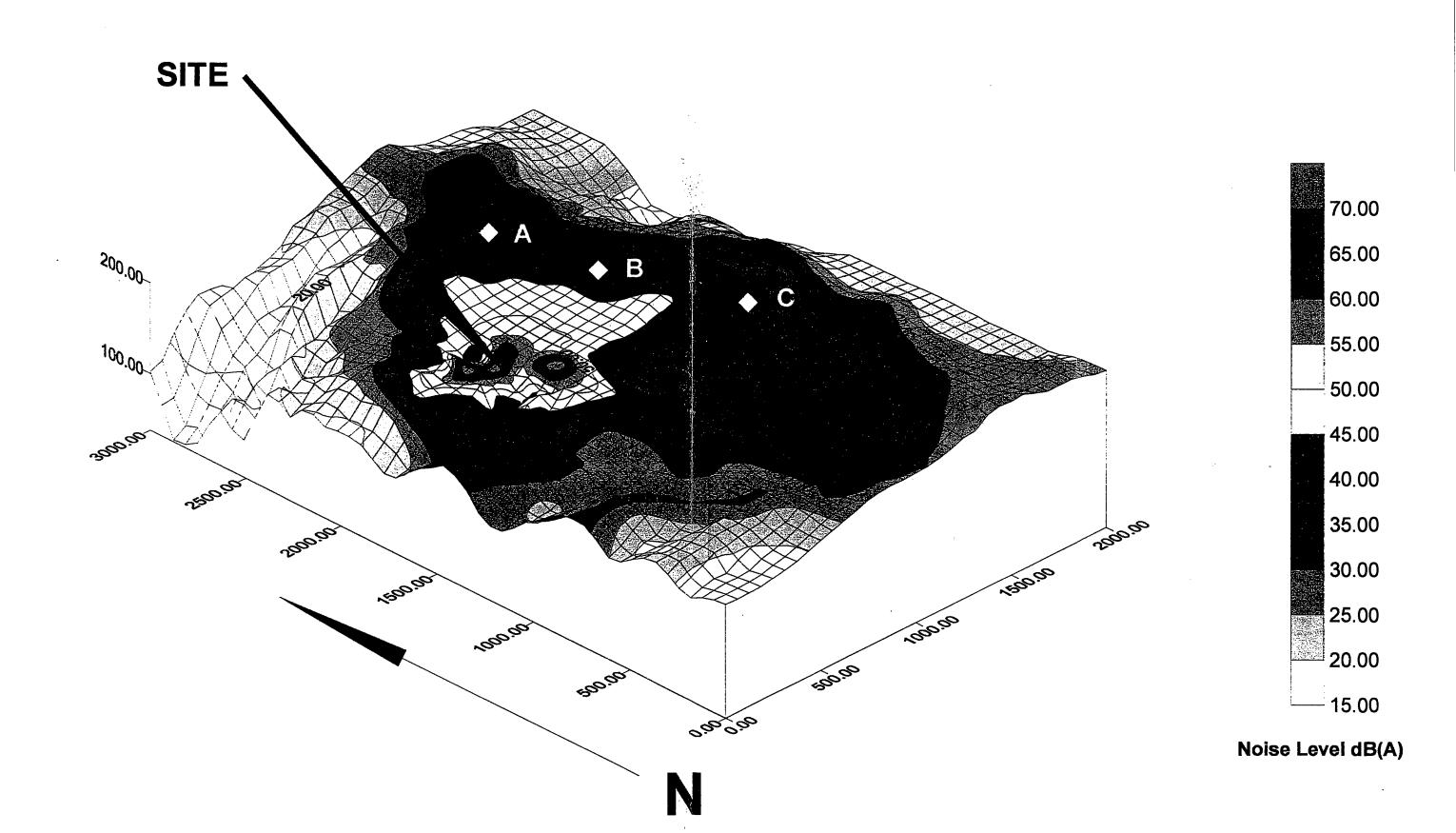


FIGURE 9 - Scenario 3A (earth berms included, no wind)

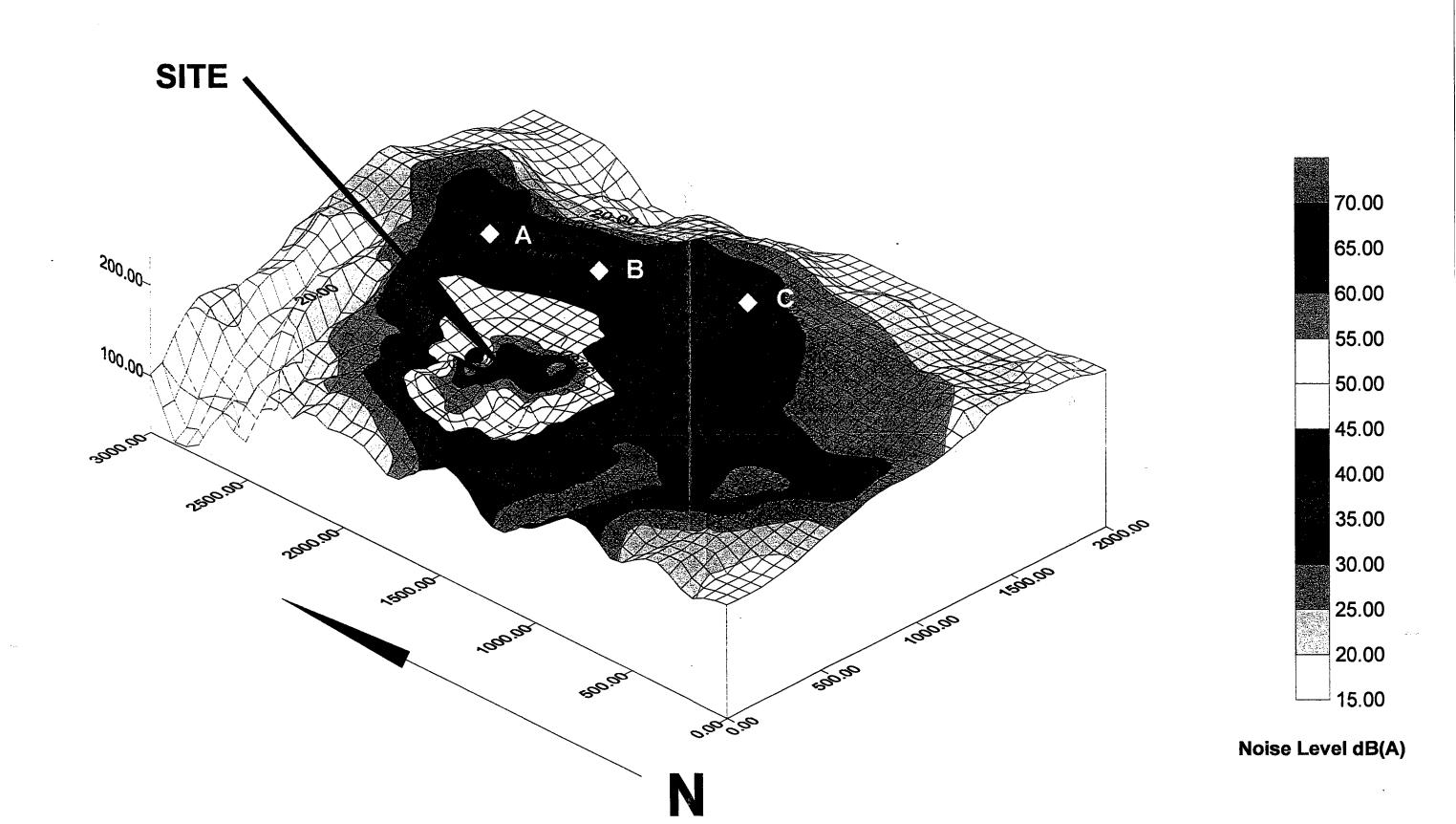
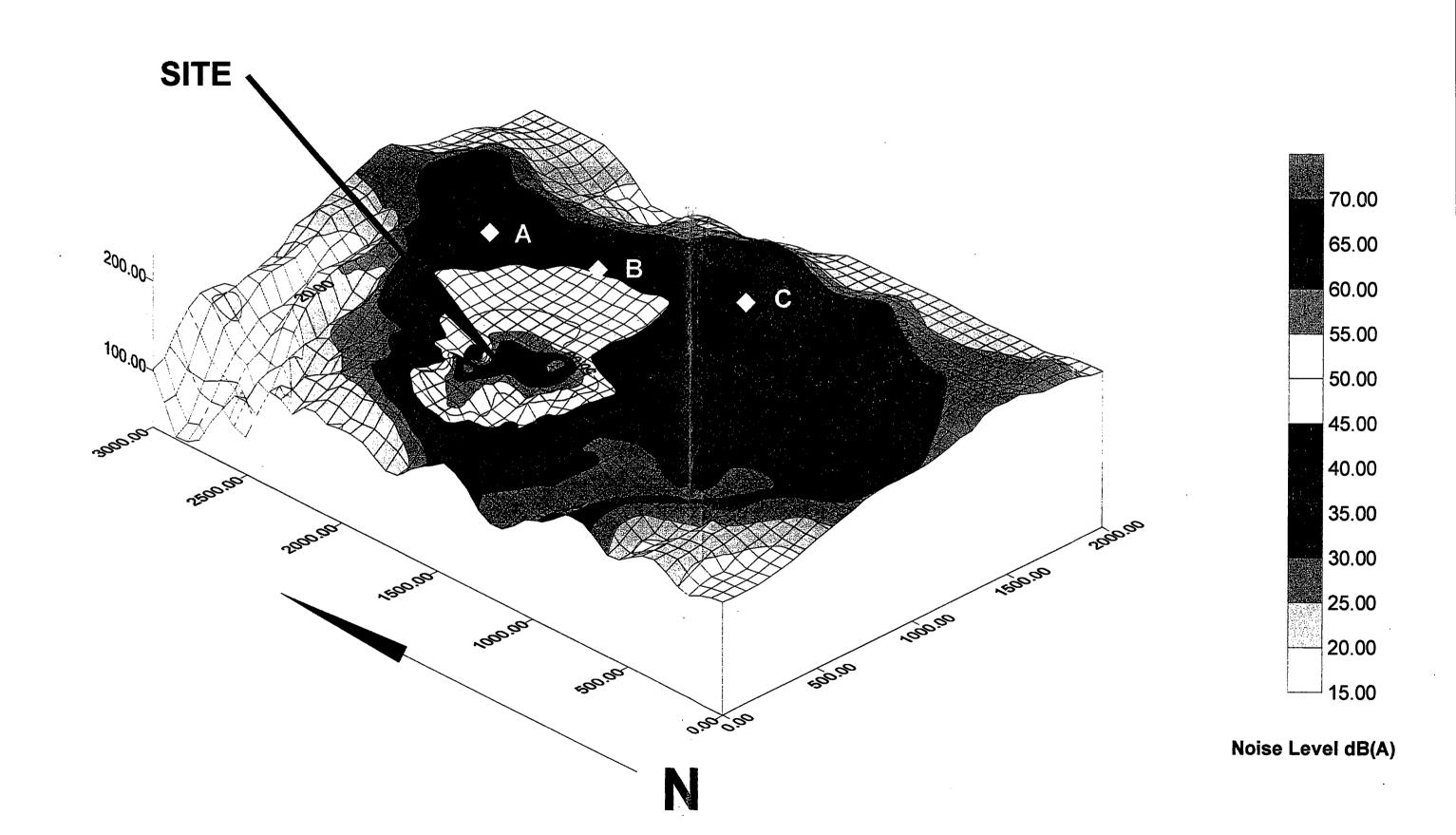


FIGURE 10 - Scenario 3B (earth berms included, 2m/s westerly wind)



## 5.1.2 Proposed Additions to the Plant

As discussed earlier, it is proposed that several additional items of processing plant will be commissioned following development approval. It was not possible to obtain accurate noise source data for the new plant and therefore the noise modelling presented in the previous section does not include the new plant. However, the new plant will be electric powered and conveyors and crushers will be lower rated than the existing plant.

It is therefore anticipated that noise source levels will be well below the noise emissions produced by the existing plant.

An analysis of the ENM modelling outputs has found that the mobile plant and truck movements are the most significant contributors to the site noise emissions. The existing plant and the proposed plant will be situated in an area with considerable topographical shielding.

The maximum predicted noise emissions from the existing stationary plant occur at Location B. The combined level for all noise sources within the processing plant is 32.5 dB(A). This level was predicted during the modelling scenario 3B with the earth berms in place. The total combined noise level from the site for this scenario was 44 dB(A) at Location B. Therefore, if the proposed plant is conservatively assumed to produce the same level of noise emissions as the existing plant, the revised total noise emission from the site will remain at 44 dB(A).

Therefore, whilst detailed noise modelling has not been possible, the additional plant will not effect the predicted noise emissions presented in the previous section.

# 5.2 ROAD TRAFFIC NOISE

This section details the predicted impact of road traffic noise from the proposed quarry. Lyall & Macoun Pty Ltd supplied details of the proposed number of truck movements and transport routes.

It is proposed that the proposed operations will require 60 truck loads per day. This equates to 120 truck movements per day. There will be a requirement for 15 truck loads during the 6am - 7am period (30 movements) and 5 truck loads during the 7am - 8am period (10 movements). The remaining movements will generally be distributed evenly over the 7am - 6pm period.

The main transport routes for the proposed operations are as follows:

- Trucks will travel from the site and turn right onto Old Northern Road (heading south).
- At the intersection of Old Northern Road and Wisemans Ferry Road, approximately 50% of trucks will continue south along Old Northern Road and the remaining 50% will travel along Wisemans Ferry Road.

### 5.2.1 Traffic Counts

Traffic counts were carried out along the proposed transport routes. The traffic counts provide information regarding total vehicles and percentage of heavy vehicles for each hour of the day. The counts were carried out over a seven day period. The Average Daily Traffic (ADT) flows for Monday to Sunday for each count location are presented in Table 5.5.

Table 5.5; Ex	kisting Average I	Daily Traffic Flows
Location	ADT	Heavy Vehicle Percentage
Old Northern Road – North of Intersection	2016	6.7 %
Old Northern Road – South of Intersection	2019	10.4 %
Wisemans Ferry Road	1624	15.5 %

## 5.2.2 TNOISE Modelling

The traffic noise computer model - TNOISE which is based on the "Calculation of Road Traffic Noise" by the UK Department of Transport, 1988, was utilised to predict the impact of proposed increases in truck movements along the two proposed routes. The predicted impact is based on modelling of semi-trailer trucks, which are typical for quarried product transport.

Traffic noise levels have been predicted based on the measured traffic flows at the four residential locations where existing traffic noise levels were monitored. These are:

Location D: Residence at 165A Old Northern Road, Maroota.

Location E: Residence at Lot 1 Old Northern Road, Maroota.

**Location F:** Residence at Maroota Motors Pty Ltd, Corner of Old Northern Road and Roberts Road, Maroota.

**Location G:** Residence at the corner of Wisemans Ferry Road and Haerses Road, Maroota.

The purpose of the traffic noise modelling for existing flows is to calibrate the model. Several site specific factors need to be calibrated for each location. Predicted  $L_{A10,18hr}$  and  $L_{Aeq,24hr}$  noise levels were used to assess the calibration against the measured noise levels.

The results of the calibration are presented in Table 5.6.

	Table 5.6: Calib	ration of the tra (dB(A))	ffic noise model		
Location	Measured !	Noise Level	Modelled noise level		
	L <sub>A10,18hr</sub>	L <sub>Aeq,24hr</sub>	L <sub>A10,18hr</sub>	L <sub>Aeg,24hr</sub>	
D	58.6	53.1	59.0	53.5	
E	64.9	58.1	64.6	59.1	
F	56.4	52.9	56.7	53.2	
G	54.7	52.1	55.0	51.5	

An accurate calibration of the traffic noise model has been achieved. All modelled noise levels are within 1 dB(A) of the measured noise level.

The TNOISE model can now be used to predict the hourly increase in  $L_{\text{Aeq}}$  noise levels due to the increase in traffic movements from the site. The existing hourly  $L_{\text{Aeq}}$  noise level was modelled for each location using the calibrated TNOISE model. The hourly  $L_{\text{Aeq}}$  noise levels were then modelled again with the inclusion of the anticipated truck movements from the site. The results are presented in Tables 5.7-5.10.

Table 5.7: Modelled hourly L <sub>Asq</sub> noise levels — Location D (dB(A))							
Period	Modelled existing L <sub>Aeq</sub>	Modelled proposed $L_{Aeq}$	Increase				
6am – 7am	52.4	56.3	3.9				
7am – 8am	54.1	56.0	1.9				
8am – 9am	55.0	56.5	1.5				
9am – 10am	55.0	56.5	1.5				
10am – 11am	55.7	57.1	1.4				
11am - 12pm	55.8	57.1	1.3				
12pm – 1pm	54.9	56.4	1.5				
1pm – 2pm	55.7	57.1	1.4				
2pm – 3pm	55.5	56.9	1.4				
3pm – 4pm	55.7	56.9	1.2				
4pm – 5pm	55.7	57.0	1.3				
5pm – 6pm	54.6	56.3	1.7				

Table 5.8: Modelled hourly L <sub>Aeq</sub> noise levels — Location E (dB(A))							
Period	Modelled existing	Modelled	Increase				
	L <sub>Aeg</sub>	proposed L <sub>Aeq</sub>					
6am – 7am	58.0	61.7	3.7				
7am – 8am	59.8	61.5	1.7				
8am – 9am	60.6	62.0	1.4				
9am – 10am	60.5	62.0	1.5				
10am – 11am	61.4	62.6	1.2				
11am - 12pm	61.3	62.5	1.2				
12pm – 1pm	60.7	62.1	1.4				
1pm – 2pm	61.4	62.6	1.2				
2pm – 3pm	61.1	62.4	1.3				
3pm – 4pm	61.3	62.6	1.3				
4pm – 5pm	61.4	62.6	1.2				
5pm – 6pm	60.3	61.9	1.6				

Table 5.9: Modelled hourly L <sub>Aeq</sub> noise levels – Location F (dB(A))							
Period	Modelled existing L <sub>Aeq</sub>	Modelled proposed L <sub>Aeq</sub>	Increase				
6am – 7am	53.7	54.9	1.2				
7am – 8am	54.6	54.9	0.3				
8am – 9am	54.7	55.2	0.5				
9am – 10am	54.2	54.6	0.4				
10am – 11am	54.3	54.7	0.4				
11am 12pm	54.6	55.1	0.5				
12pm – 1pm	54.3	54.7	0.4				
1pm – 2pm	54.7	55.1	0.4				
2pm – 3pm	55.1	55.5	0.4				
3pm – 4pm	55.2	55.5	0.3				
4pm – 5pm	55.9	56.3	0.4				
5pm – 6pm	55.5	55.9	0.4				

Table 5.10: Modelled hourly L <sub>Asq</sub> noise levels – Location G (dB(A))			
Period	Modelled existing L <sub>Aeq</sub>	Modelled proposed L <sub>Aeq</sub>	Increase
6am – 7am <sup>.</sup>	52.4	53.7	1.3
7am – 8am	53.6	53.9	0.3
8am - 9am	53.1	53.5	0.4
9am – 10am	53.0	53.4	0.4
10am – 11am	52.3	52.7	0.4
11am - 12pm	52.3	52.7	0.4
12pm – 1pm	52.6	53.0	0.4
1pm – 2pm	52.3	52.8	0.5
2pm – 3pm	52.6	53.0	0.4
3pm – 4pm	53.3	53.7	0.4
4pm – 5pm	53.8	54.2	0.4
5pm – 6pm	53.6	53.9	0.3

## 5.2.3 Assessment of Traffic Noise Impact

A recognised road traffic noise model has been used to predict traffic noise impacts from the proposed development. The model was calibrated for each of the four locations using site specific data and the calibration was checked against measured traffic noise levels.

The model was then used to predict the hourly increase in  $L_{Aeq}$  noise levels from the proposed development. The criterion used to assess the impact was to limit the hourly increase by no more than 2 dB(A). Whilst it could be argued that this objective is overly stringent, it will ensure that the potential for adverse impact is minimised.

The results of the modelling show that the increase in hourly  $L_{Aeq}$  noise levels is well below 2 dB(A) for the locations south of the intersection of Old Northern Road and Wisemans Ferry Road (Locations F and G).

The residences between the intersection and the site access road are exposed to all of the 120 anticipated truck movements per day. However, the hourly increase in  $L_{Aeq}$  noise levels remains below 2 dB(A) for all periods except the 6am to 7am period where the objective is exceeded.

There are several points to consider in assessing the truck movements during this period:

a) There are fourteen residences located along Old Northern Road between the intersection of Wisemans Ferry Road and the site access road. Based on Council's DCP (Figure 11), there are only 5 residences where the properties are not to be used or associated with extraction. One of the five residences is owned by Mr and Mrs Accurso, who lease part of their land for sand extraction purposes. Two other residences are owned by employees of Dixon Sand and PF Foundation. Therefore, there are only two premises that are independent of the extractive industries.

- b) An important issue associated with truck movements from the quarries in Maroota is safety outside Maroota Public School. The increase in movements in the early morning period will considerably reduce movements during the 8am to 9am period past the school, thus improving road safety.
- c) The residences on Old Northern Road between the intersection with Wisemans Ferry Road and the site access are all set back a considerable distance from the roadway (ranging from approximately 30 100 metres). Noise modelling has been based on locations approximately 10 20 metres from the roadway. Whilst the increase in noise levels will not change at greater setbacks, the noise level will fall below planning objectives.
- d) The large volume of truck movements in the 6am to 7am period is required so that trucks can travel to Sydney before peak hour commences. A reduction in movements in this period would severely affect the ability of the quarry to service the market. Restricting this capacity would contradict the objectives of the NSW EPA Environmental Noise Control Manual.

Therefore, whilst the increase in predicted traffic noise levels exceeds planning objectives, the potential for annoyance is considered minimal. Reduced truck movements during school hours will improve safety for the community of Maroota.

It should be noted that the TNOISE traffic model has been developed for overseas conditions and therefore conservative factors have been applied to ensure a worst case assessment. A noise compliance study will be undertaken as part of the ongoing environmental management of the site. The compliance study will accurately determine the impact of truck movements on existing traffic noise levels. Restrictions on truck movements should be reserved until the compliance study is assessed.

## 5.2.4 Traffic Noise Impact at Maroota Public School

The impact of increased traffic noise levels at Maroota Public School is best assessed by analysing the modelling results for Location D. This location is also located on Old Northern Road between the site access road and the Wisemans Ferry Road intersection.

The modelled noise levels are based on a position approximately 10 metres from the roadway. However the nearest classroom to Old Northern Road is approximately 35 metres from the road.

Whilst the increase in noise levels will not be significantly different, the predicted noise levels will be considerably lower than those presented in Table 5.7 due to the increased separation distance. The land also slopes downwards from the road towards the classrooms resulting in reduced noise propagation.

The objective used for the residential traffic noise assessment will be satisfied at the classrooms. That is, the increase in hourly  $L_{\text{Aeq}}$  traffic noise levels will be less than 2 dB(A). However, the traffic noise objective for existing classrooms, as outlined in the NSW EPA Draft Environmental Criteria for Road Traffic Noise, is an internal objective of 45 dB(A).

An acceptable method of achieving this objective is limiting the external traffic noise level to 55 dB(A). The modelling for Location D has been revised with the separation distance increased to 35 metres.

Based on the anticipated truck movements outlined in the previous section, the maximum predicted hourly  $L_{Aeq}$  will be 53.6 dB(A). This result was determined for the hour of 10am - 11am.

Therefore, it can be seen that the increased truck movements will comply with all criteria relating to existing classrooms.

### 6. SAFEGUARDS

The noise modelling that has been carried out has been based on conservative factors, adverse conditions and maximum operations. The construction of earth berms and the management of truck movements will ensure that, even under the influence of conservative factors, the site noise emissions will comply with design objectives.

However, strict environmental management and procedures are required in all extractive industry developments. There are several safeguards that can be recommended aimed at eliminating unnecessary noise emissions:

## a) Extraction techniques

Section 2.9 of Baulkham Hills Shire Council DCP 500 states that "Proponents are encouraged to use the extraction cell technique as a means of facilitating acoustic shielding around worked extraction sites". Dick Benbow & Associates were involved in the development of this technique and have observed the effectiveness of the method on reducing noise from extraction equipment. The technique was developed primarily for extraction using an excavator. It is difficult to implement the method when a dozer and scraper are used. However, it will be possible to develop the extraction process in a manner, which maximises the use of the working face for shielding.

Extraction should be oriented such that the working face provides some shielding for the residences and school to the east of the site. This may also ensure that the exhaust of the dozer and scraper will rarely point towards the residences.

## b) Auxiliary mobile equipment

Analysis of the ENM output files has shown that auxiliary equipment such as the grader and water cart, significantly contribute to the noise emissions from the site when operating on the exposed haul roads. Therefore, the use of this equipment should not be carried out before 7am where possible.

### c) Driver education

Truck drivers entering and leaving the site will be contractors. However, Dixon Sand should encourage drivers to consider the community where possible. Particular attention should be given to the limiting of exhaust braking when travelling past Maroota Public School and in all areas during the 6am to 7am period.

d) Best Management Practice (BMP) and Best Available Technology Economically Achievable (BATEA)

The adoption of BMP and BATEA practices are encouraged by the NSW EPA and specifically addressed in the Draft Stationary Noise Source Policy. BMP includes some of the factors discussed above but also includes the encouragement of a general staff attitude to reducing noise emissions. All staff should be aware of the problems associated with noise and the proximity of residences and a school to the site.

BATEA involves the incorporation of the most advanced and affordable technology to minimise noise emissions. All future plant should be selected after considering noise emissions from the item.

It is recommended that as part of the safeguards, a noise compliance study is conducted following the commencement of operations on the site. Once the noise compliance study has been presented, the noise management plan for the site should be updated to include any recommendations for noise control or procedures.

#### 7. CONCLUSION AND RECOMMENDATIONS

The sand mining industry in this area has been able to operate by using specific measures to reduce noise nuisance and enable rehabilitation of land back to viable market gardens.

The proposed extraction of two deposits of sand would also be able to satisfy acceptable acoustic criteria. Long term community noise monitoring has taken place and the results used to determine acoustic design objectives to protect the amenity of nearest residents. The assessment criteria have been formulated from the Baulkham Hills Shire Council Development Control Plan No. 500 and existing and proposed criteria setout in the NSW EPA and RTA guidelines.

The assessment that has been undertaken has found that the use of earth berms would provide sufficient noise control. The mobile equipment in use generates noise levels free of tonal or other annoying characteristics.

An assessment of traffic noise impact has determined that the development will have little or no impact on residential traffic noise levels provided the number of traffic movements are limited to approximately 120 movements per day.

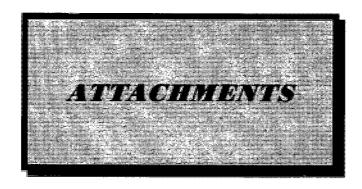
Several safeguards have also been recommended to ensure that the site will continue to operate in a manner that will not have an adverse effect on community noise levels.

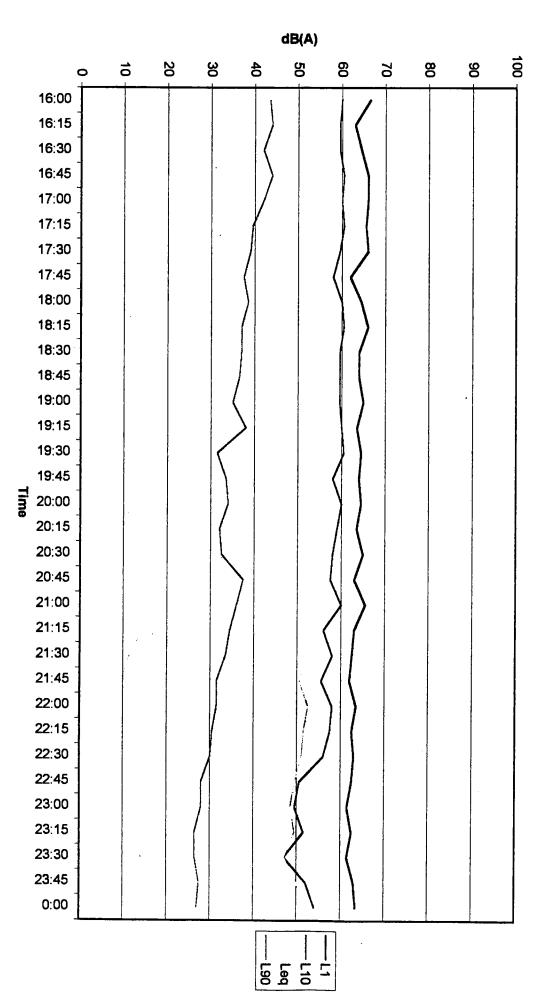
This concludes the report.

Derek Langgons
Environmental Engineer

Shane Harris
Environmental Engineer

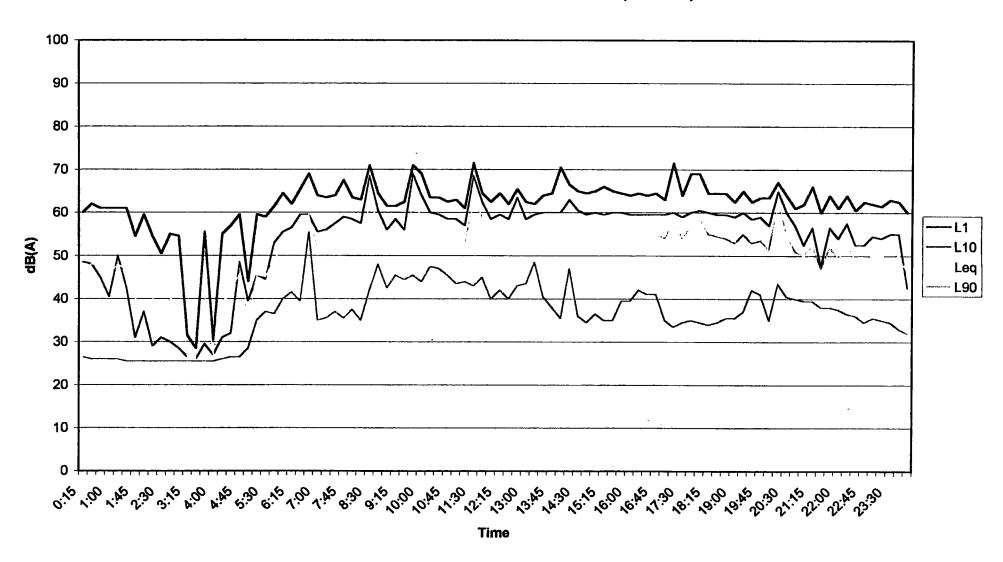
R T Benbow Principal Consultant



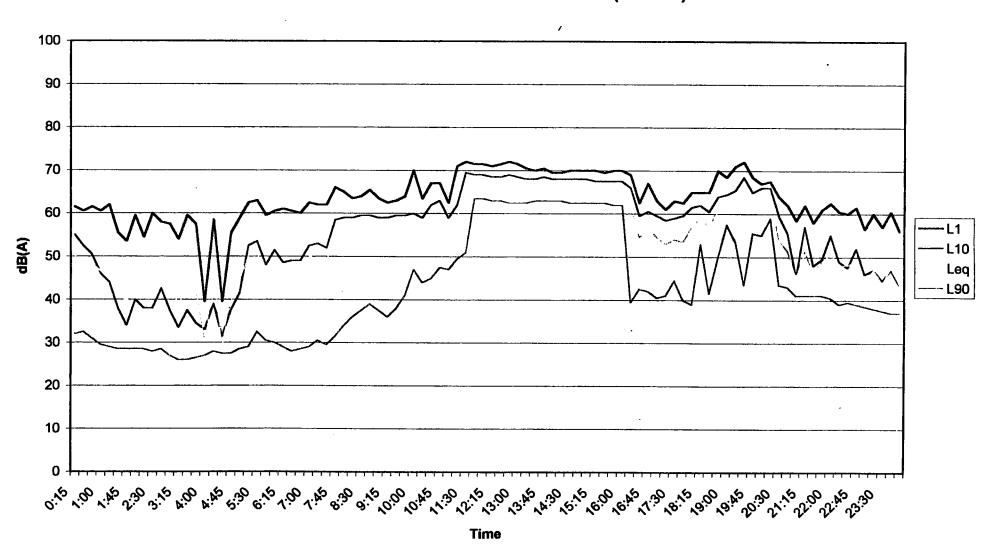


Noise Measurement Results - Location A (20/11/98)

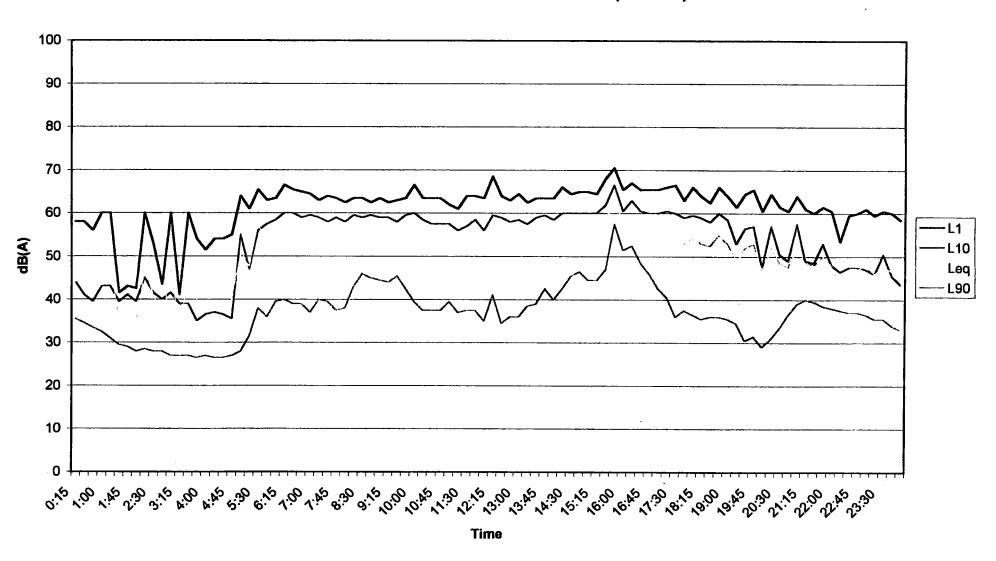
#### Noise Measurement Results - Location A (21/11/98)



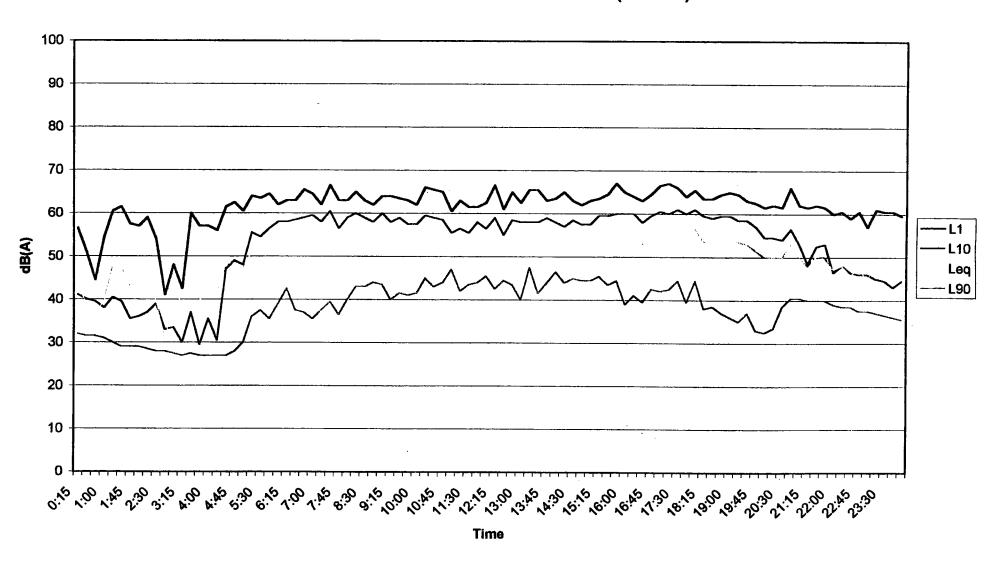
## Noise Measurement Results - Location A (22/11/98)



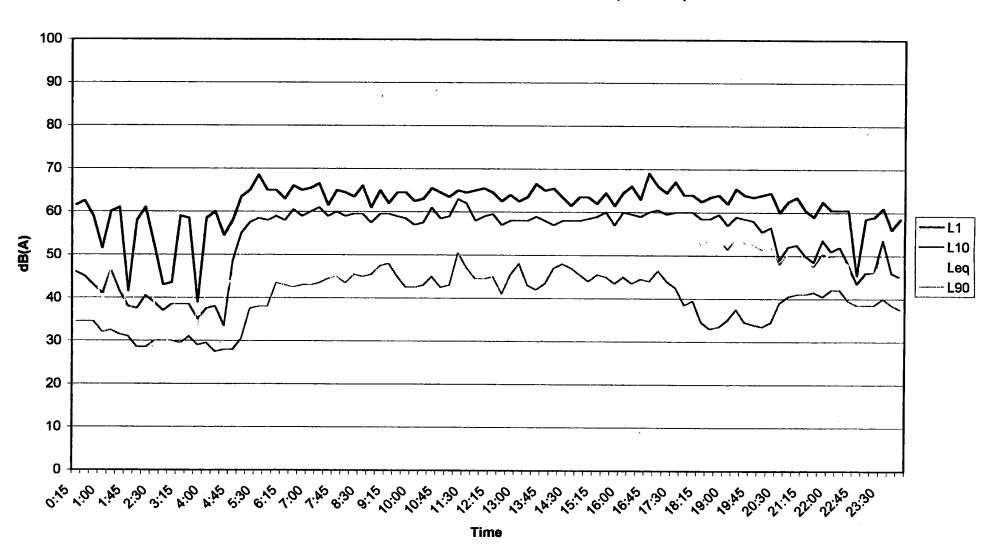
#### Noise Measurement Results - Location A (23/11/98)



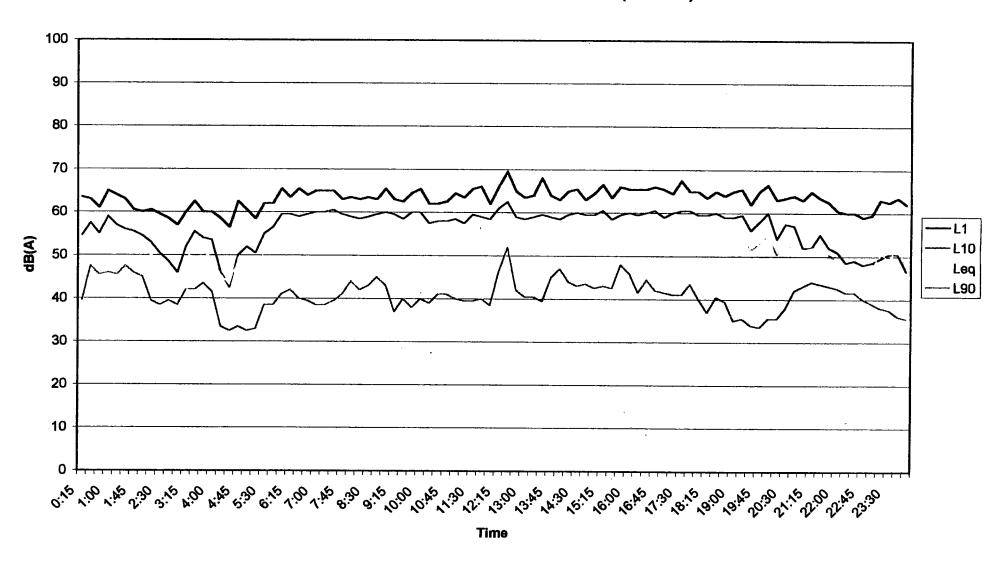
#### Noise Measurement Results - Location A (24/11/98)



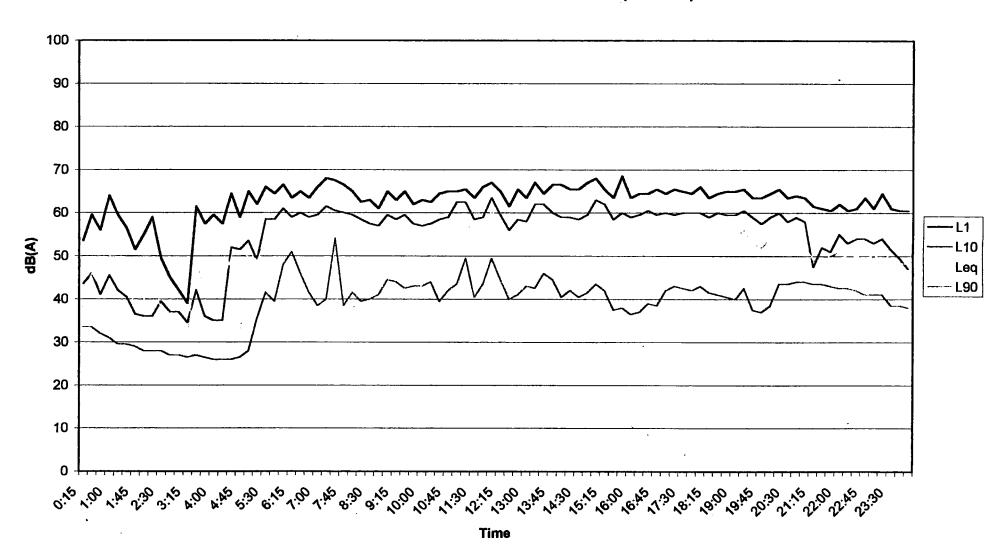
## Noise Measurement Results - Location A (25/11/98)



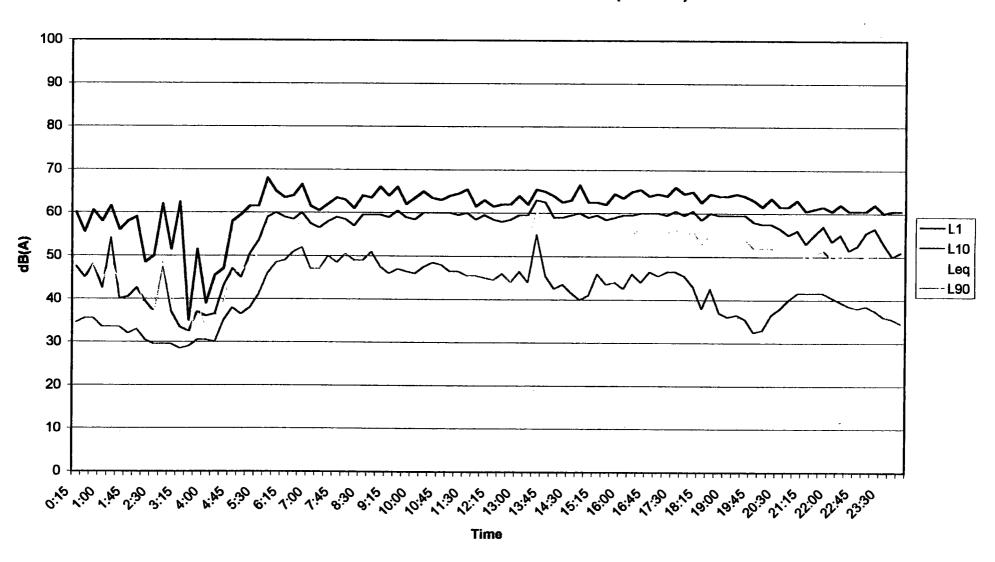
## Noise Measurement Results - Location A (26/11/98)



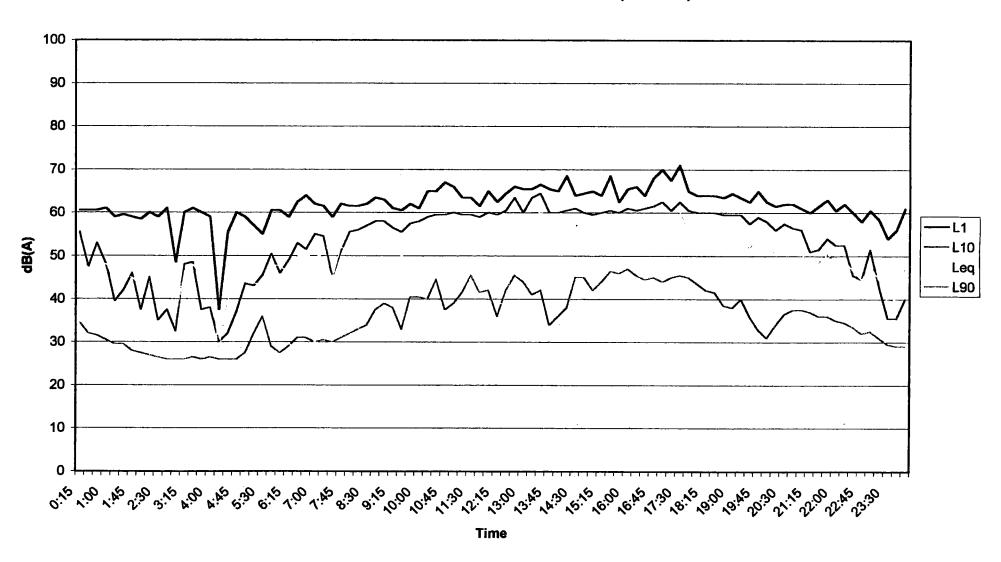
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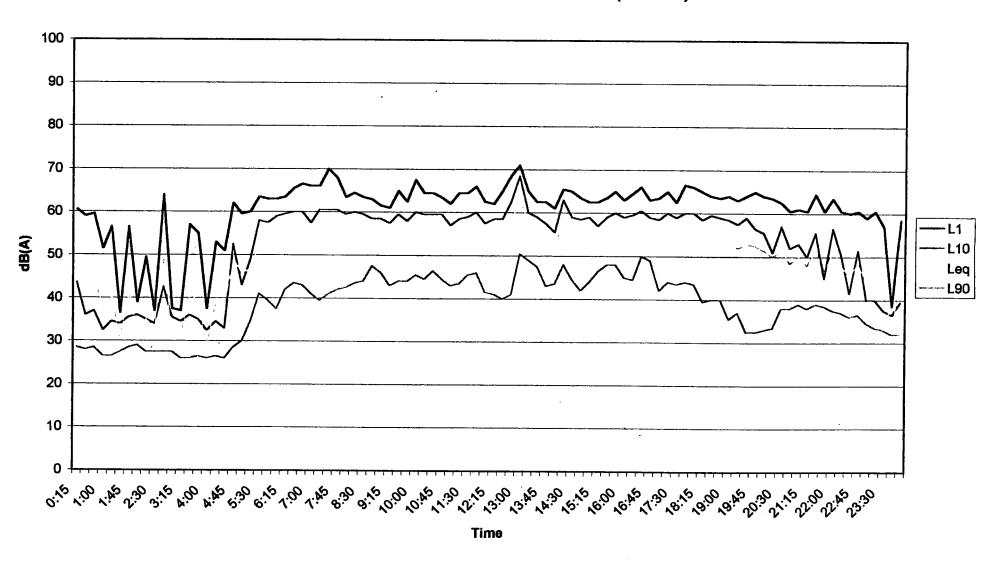
## Noise Measurement Results - Location A (28/11/98)



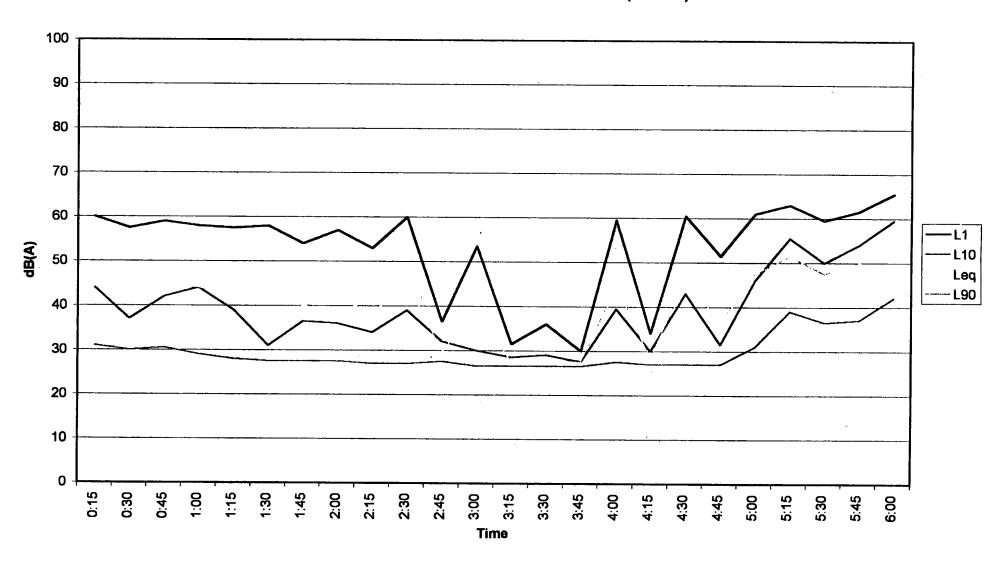
#### Noise Measurement Results - Location A (29/11/98)

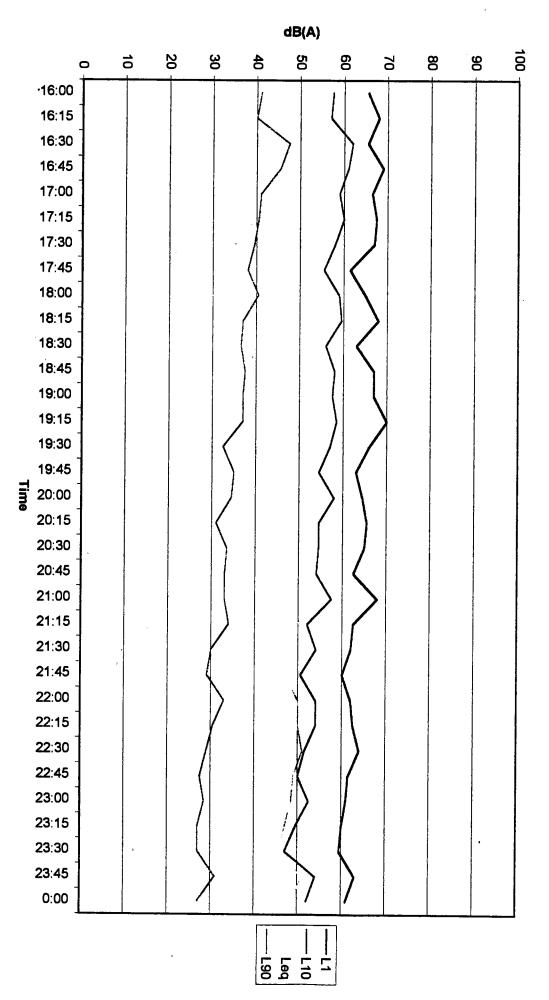


## Noise Measurement Results - Location A (30/11/98)



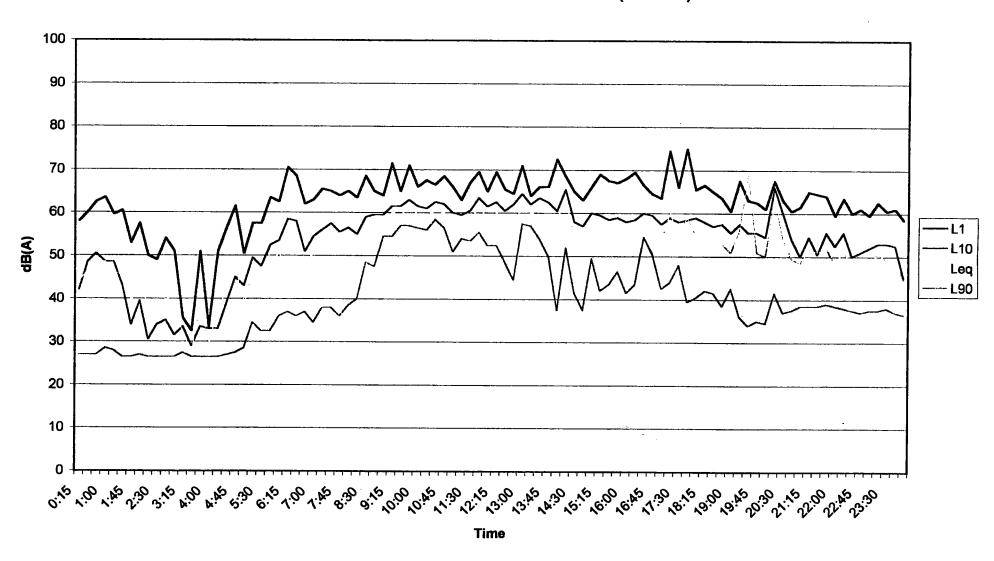
## Noise Measurement Results - Location A (1/12/98)



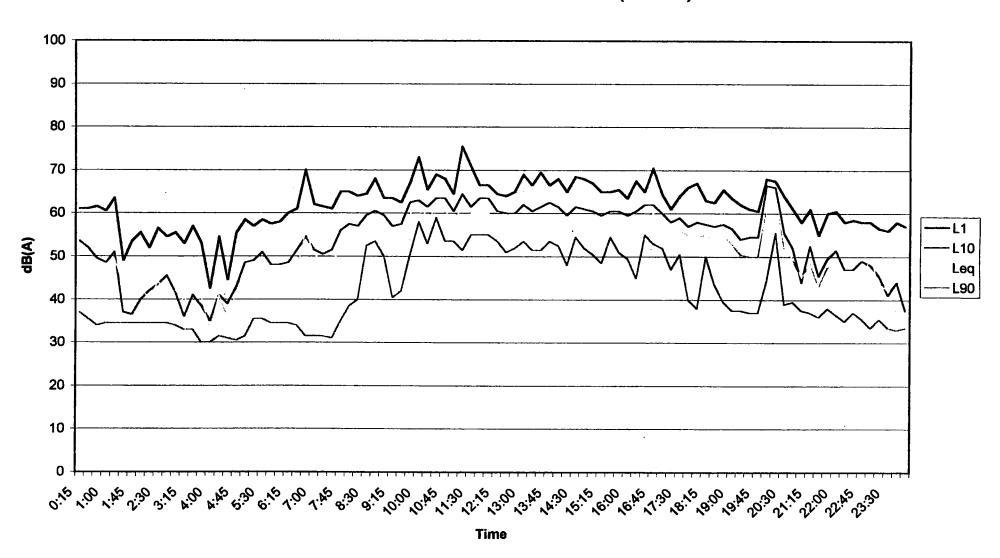


Noise Measurement Results - Location B (20/11/98)

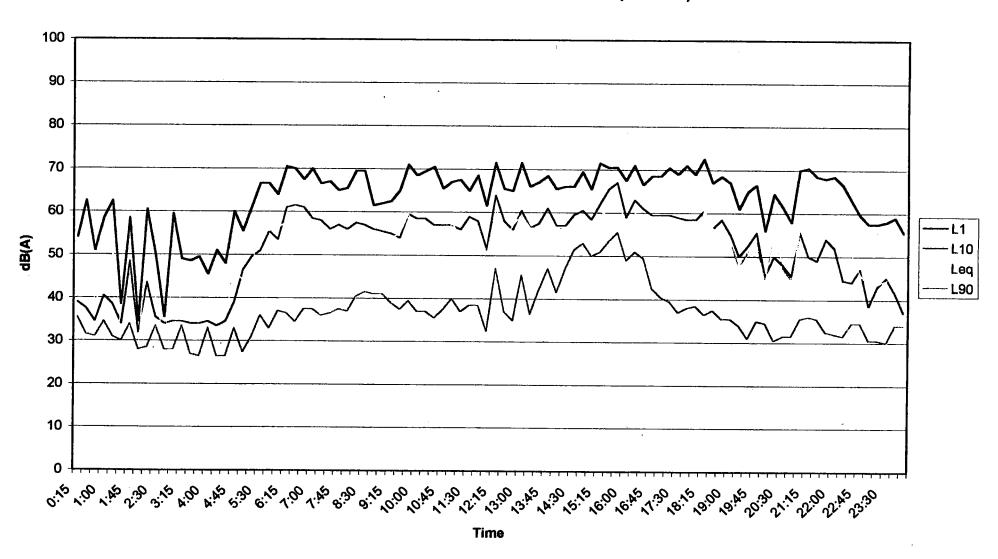
## Noise Measurement Results - Location B (21/11/98)



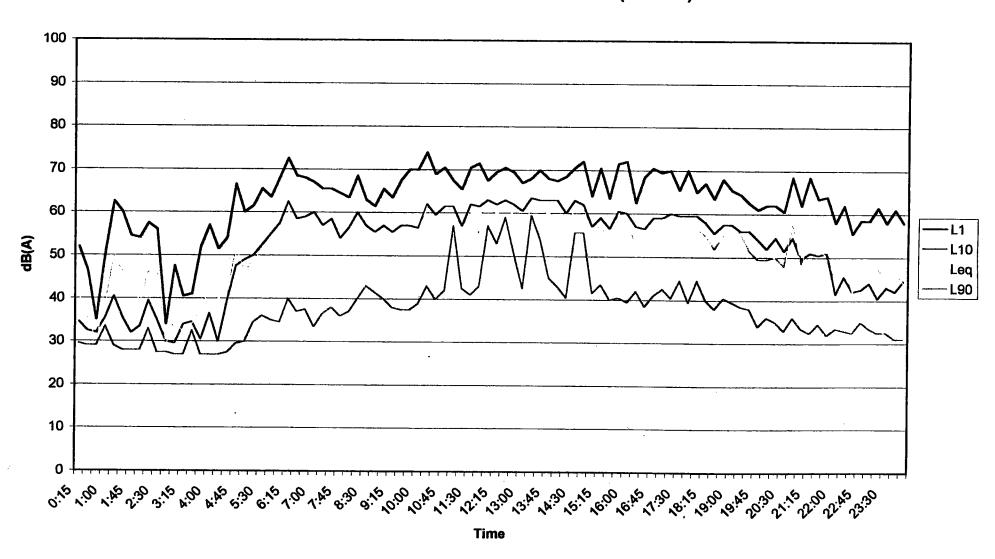
#### Noise Measurement Results - Location B (22/11/98)



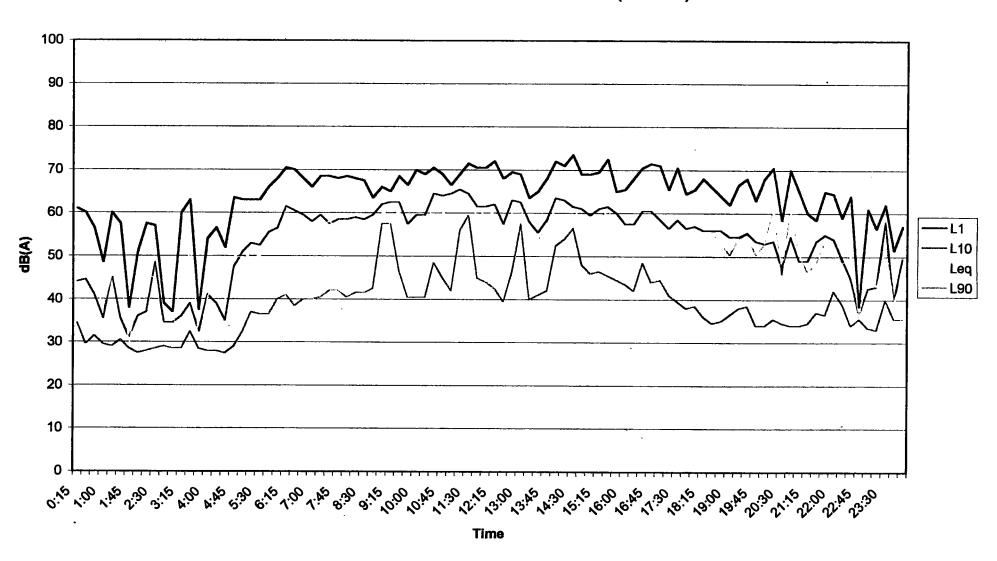
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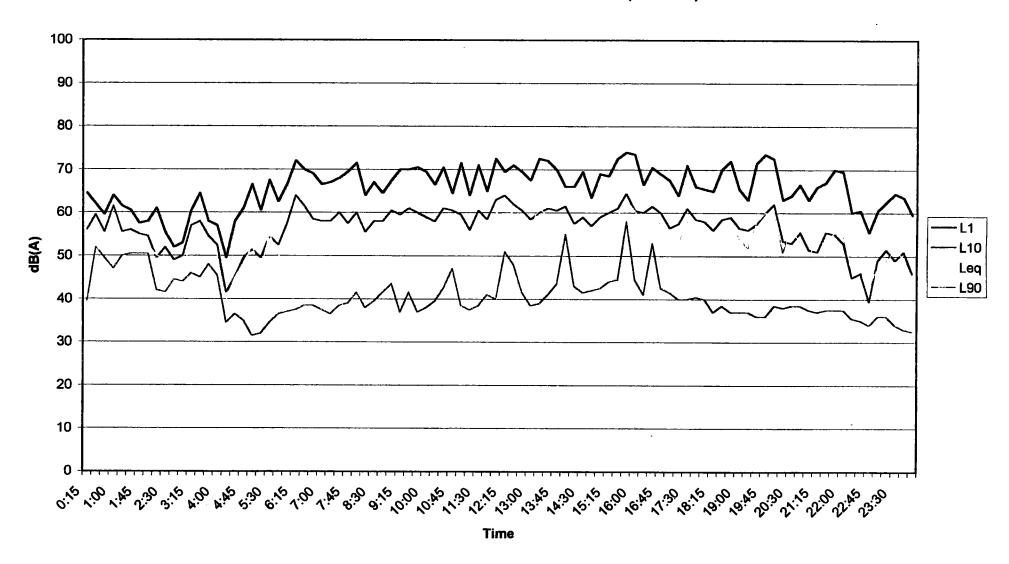
## Noise Measurement Results - Location B (24/11/98)



## Noise Measurement Results - Location B (25/11/98)

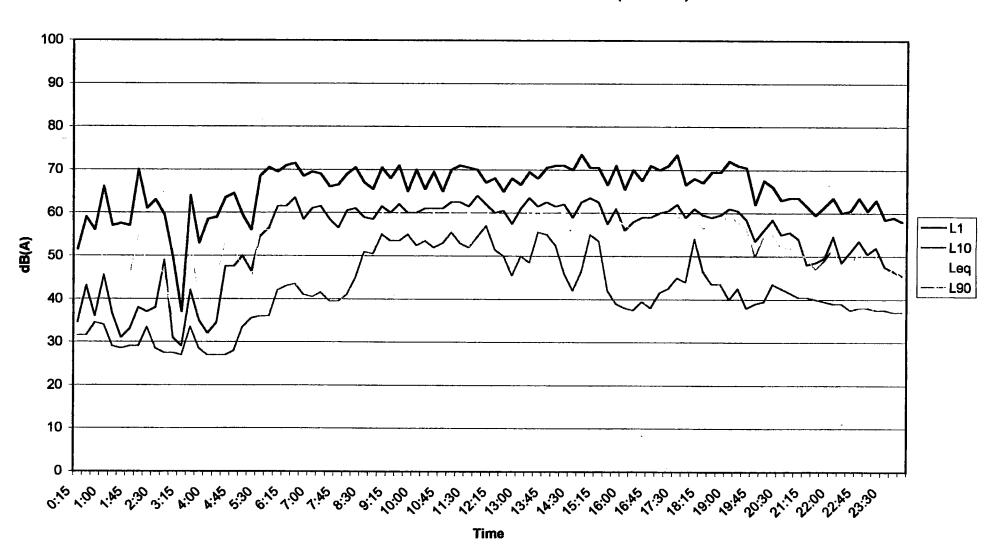


## Noise Measurement Results - Location B (26/11/98)

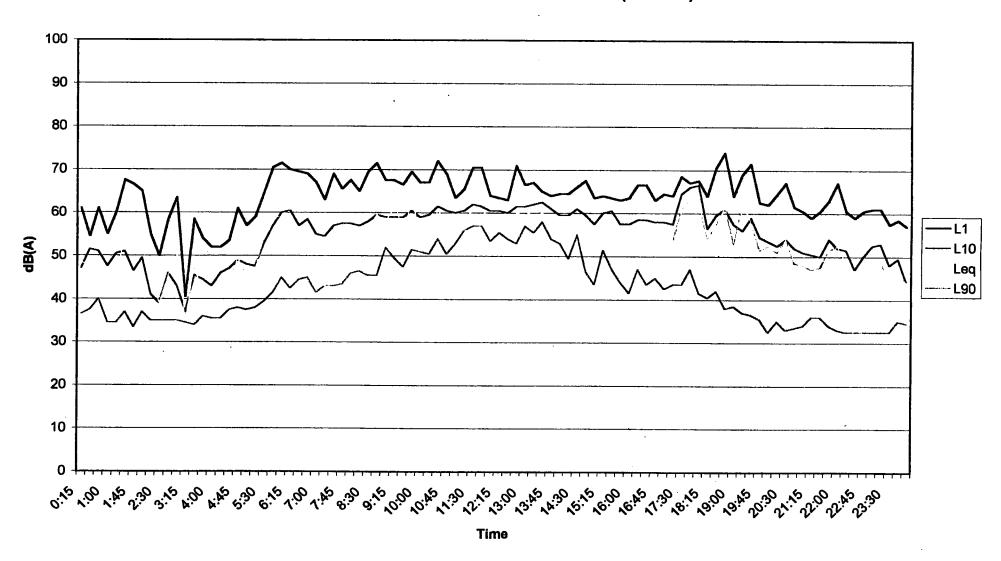


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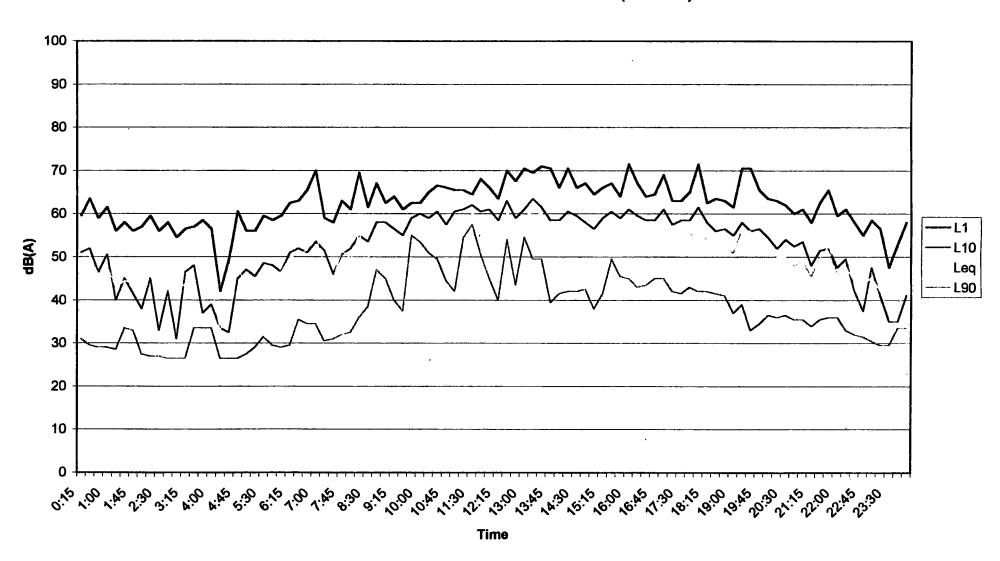
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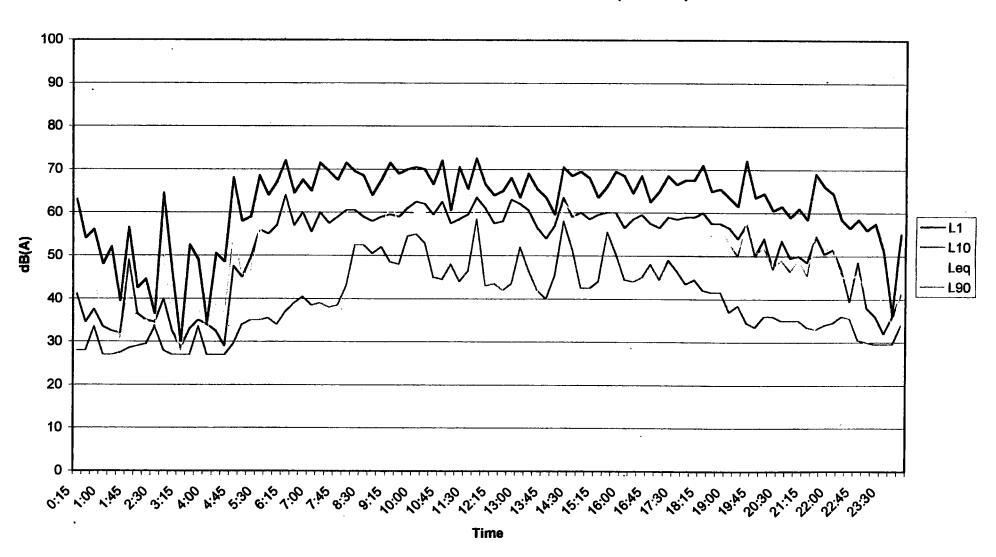
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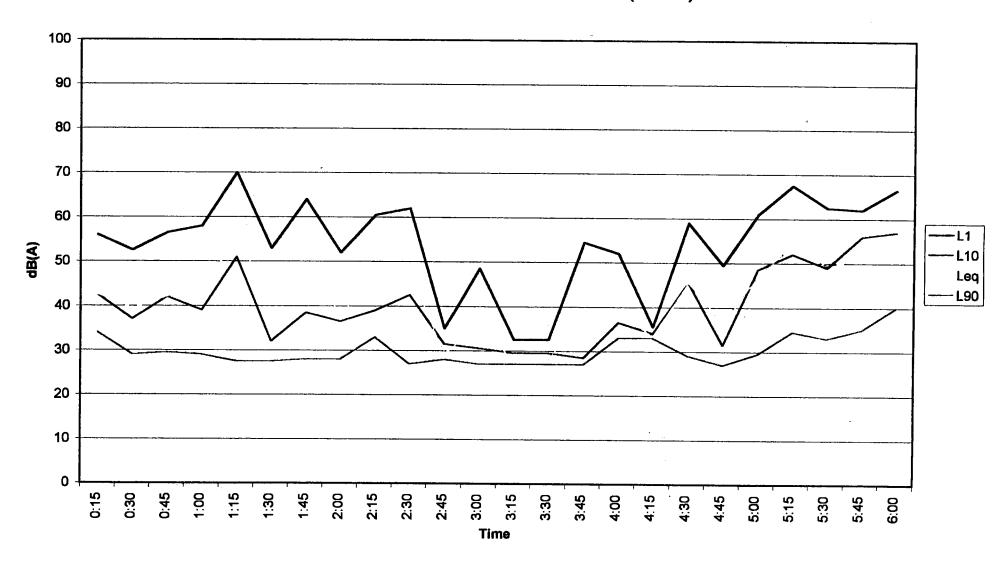
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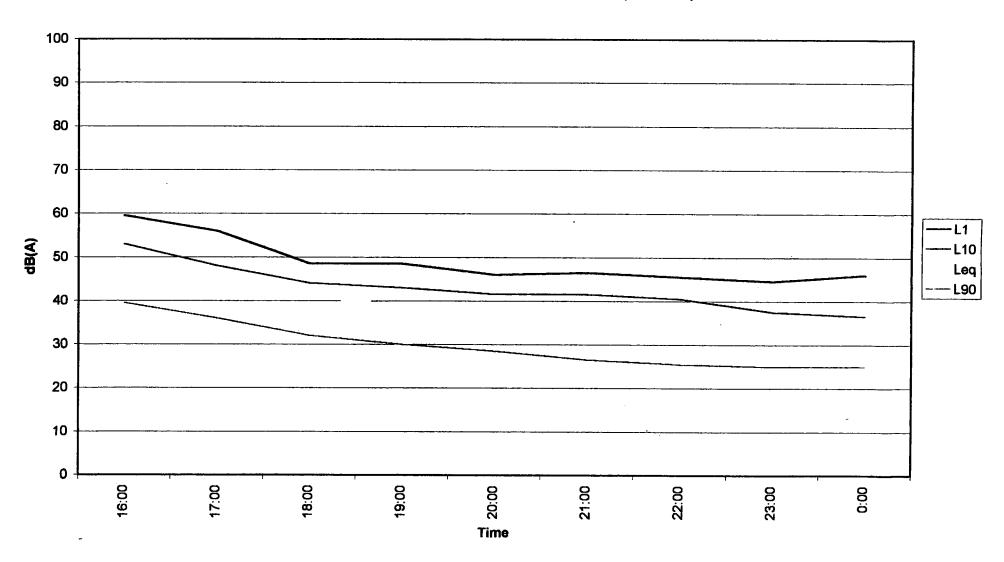
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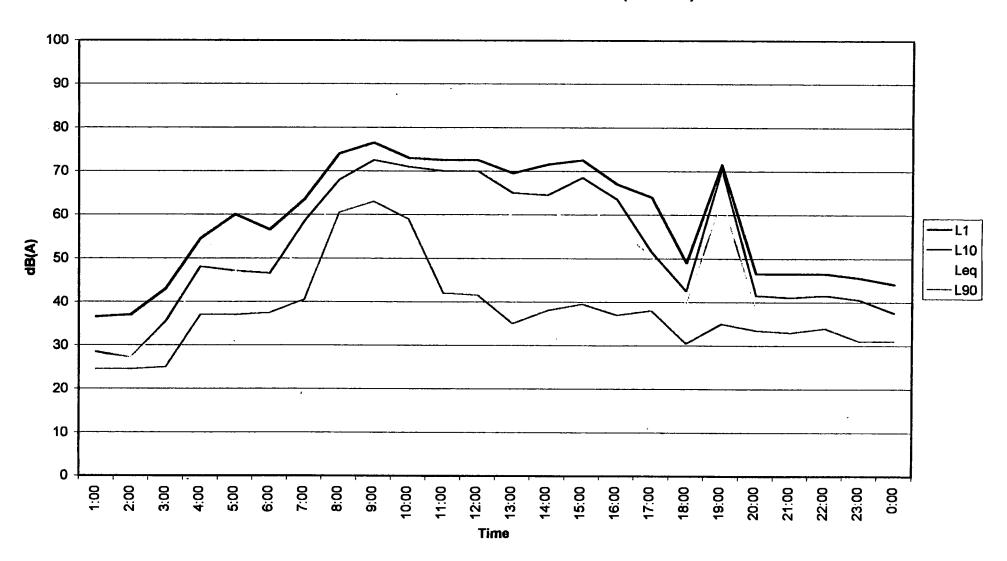
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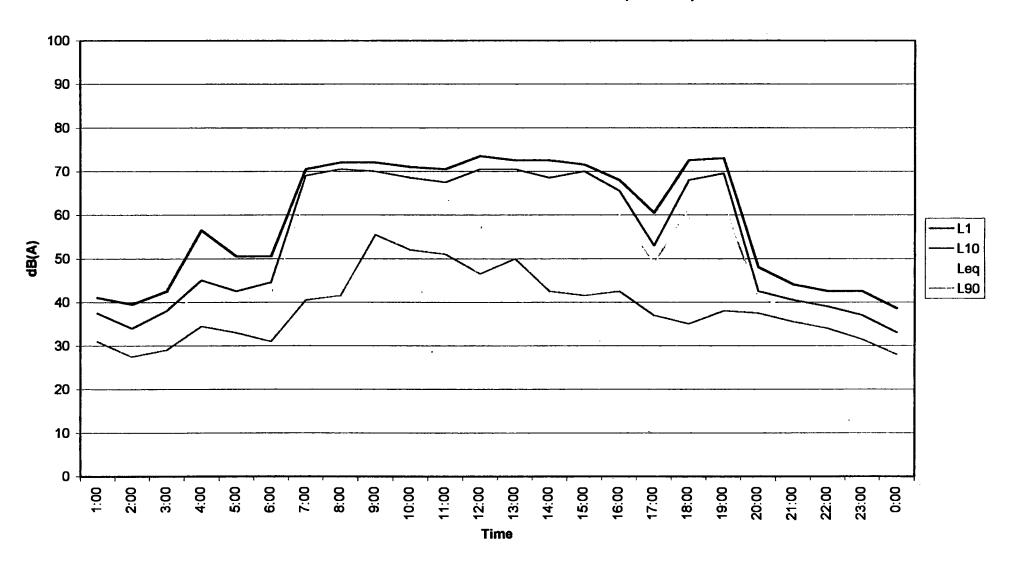
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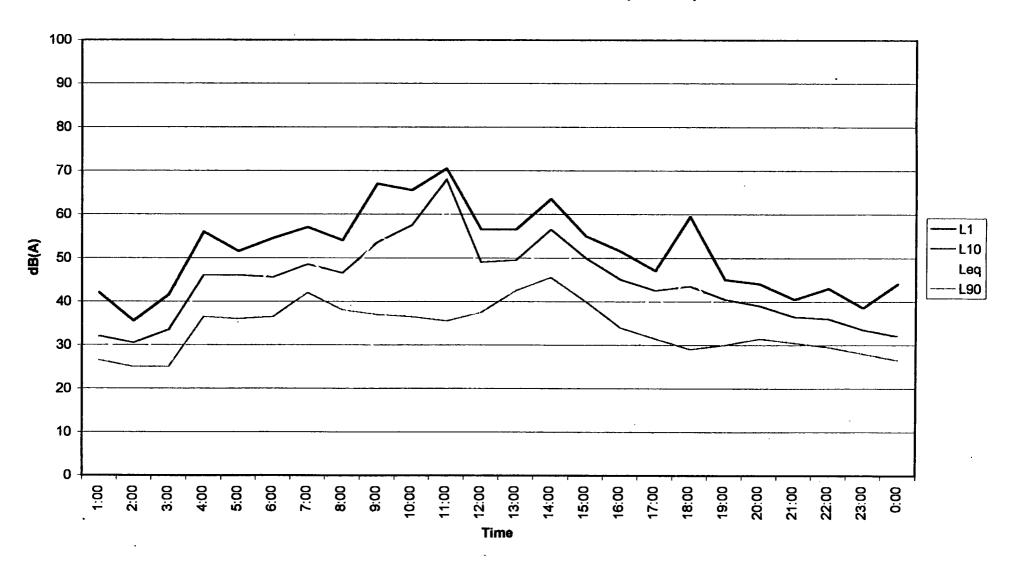


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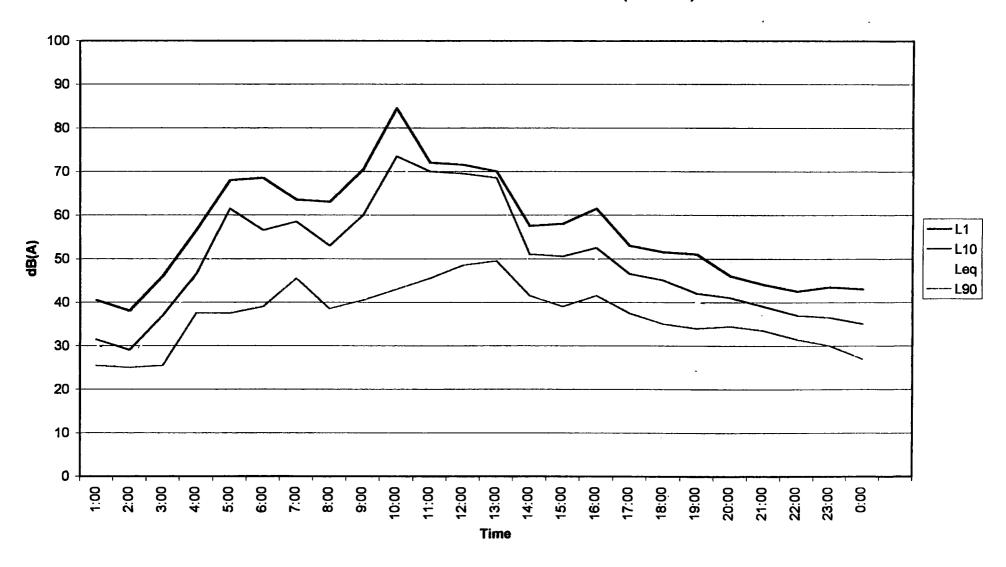


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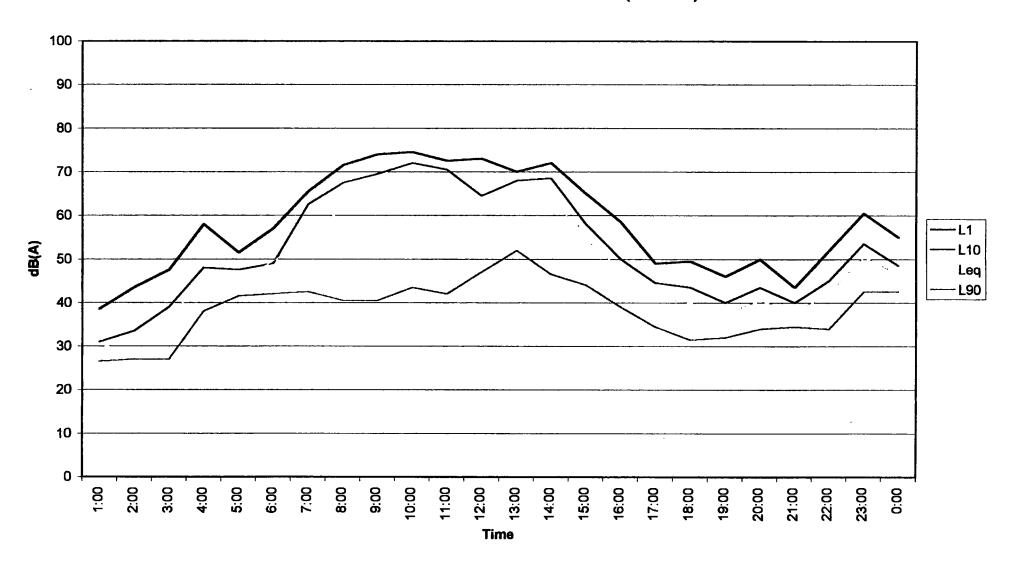


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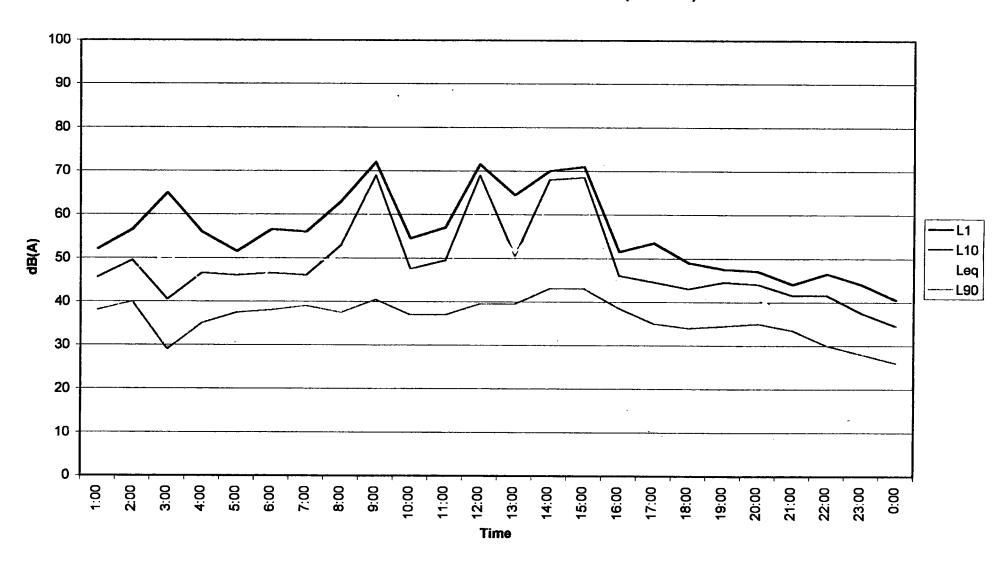


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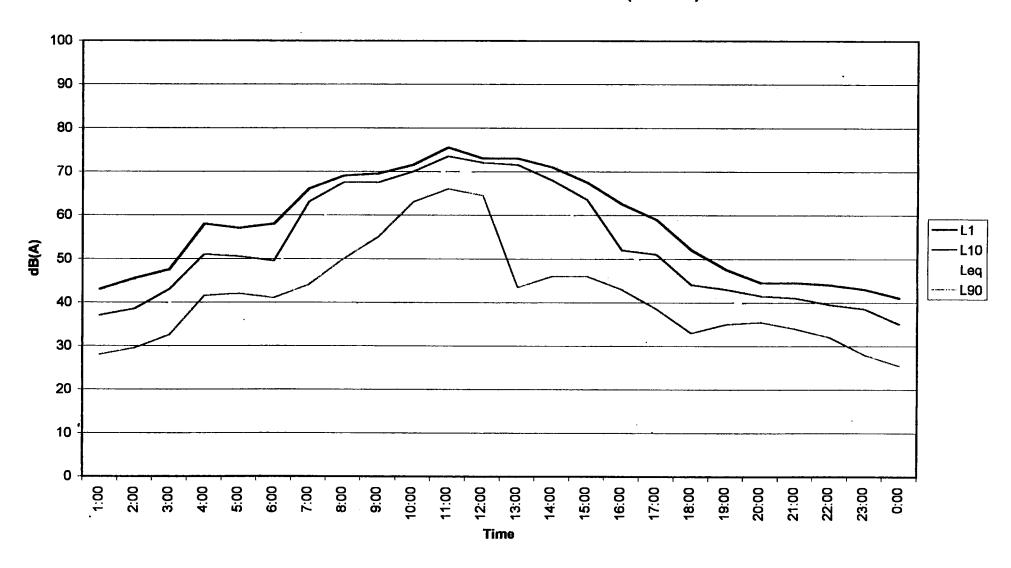
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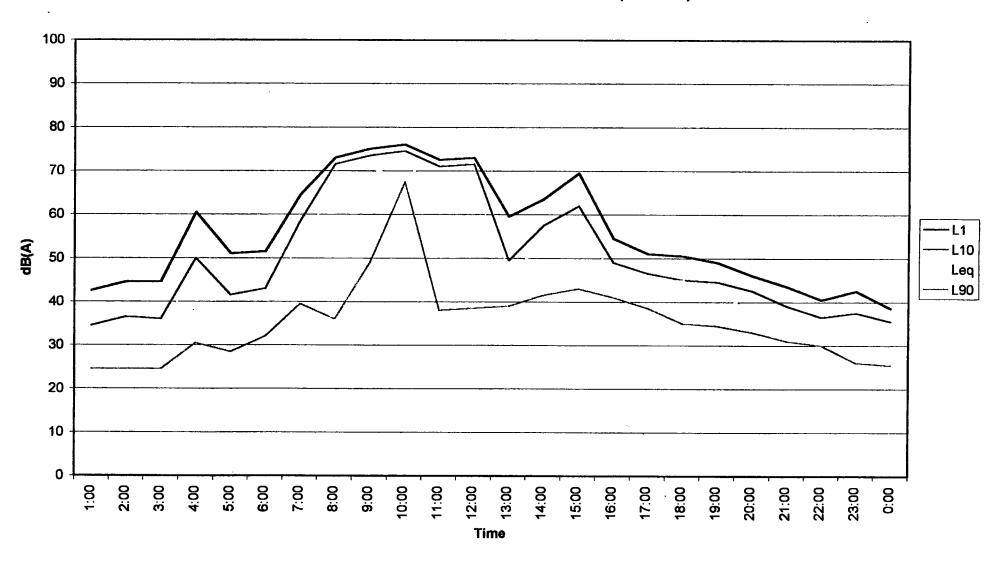
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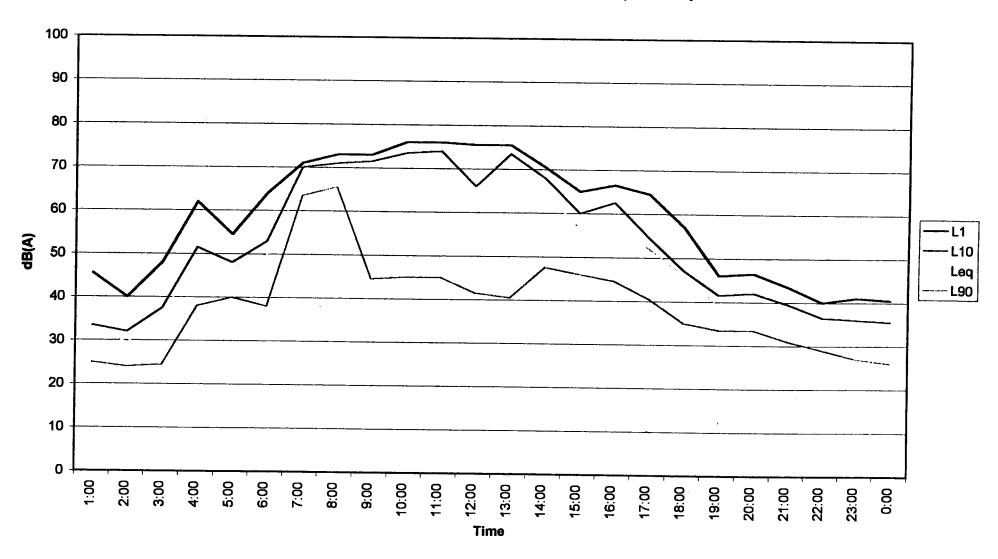
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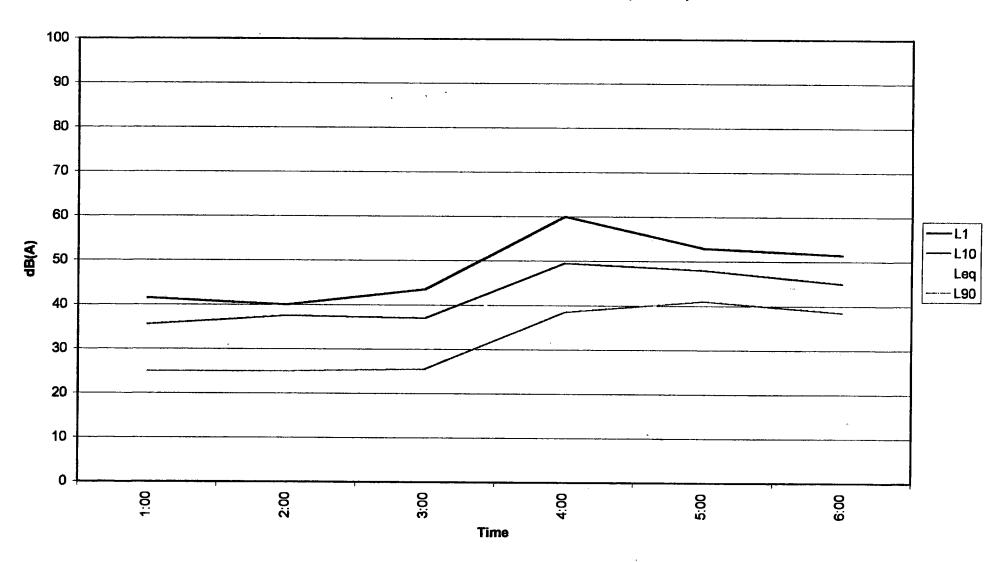
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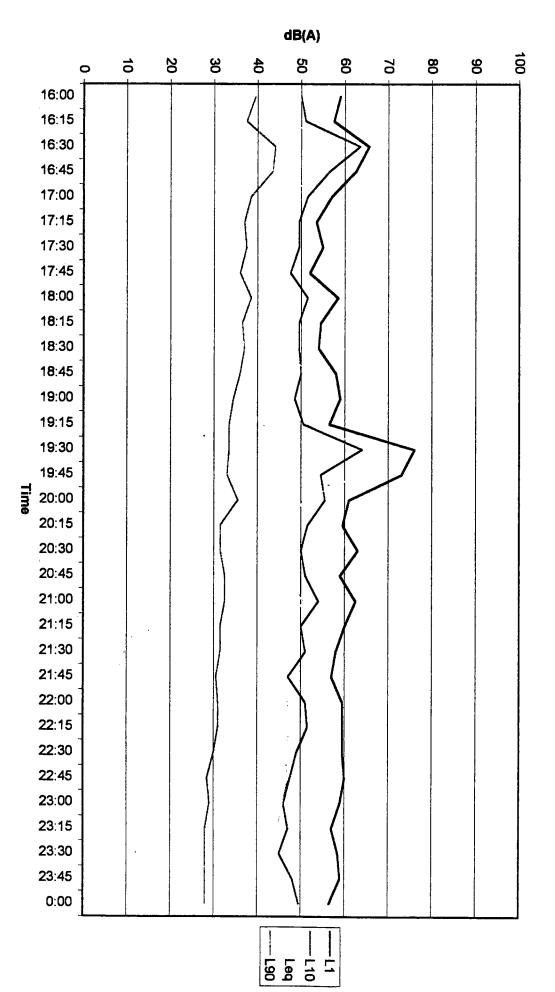
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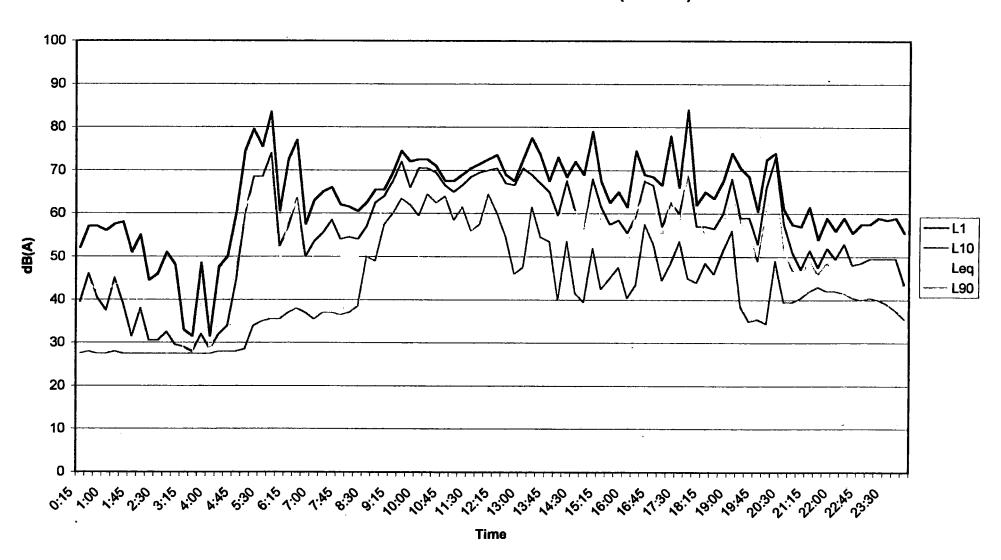


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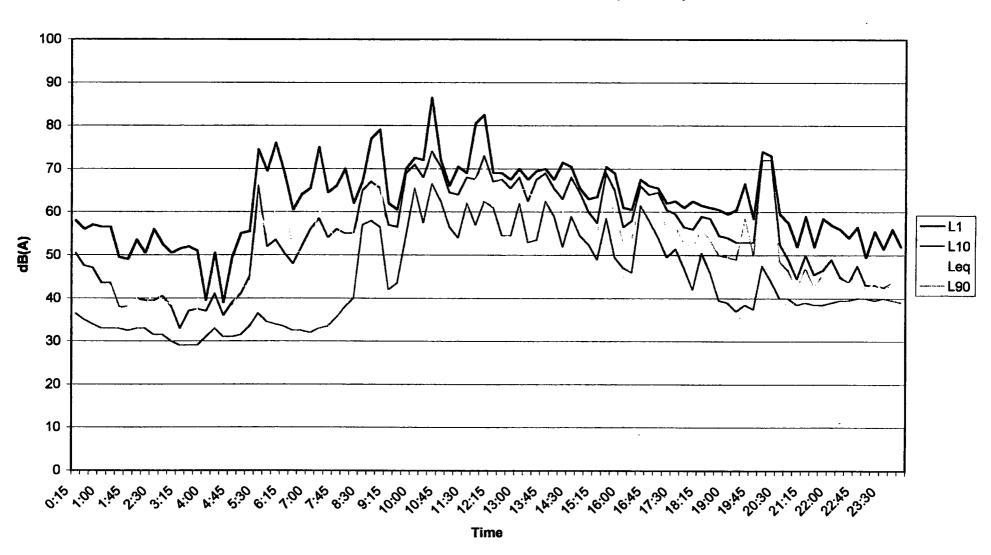


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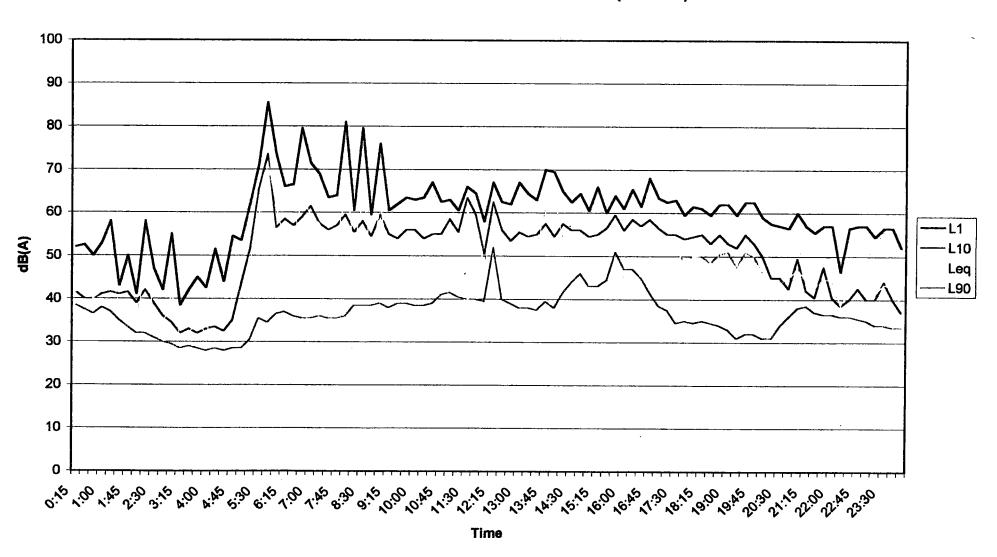
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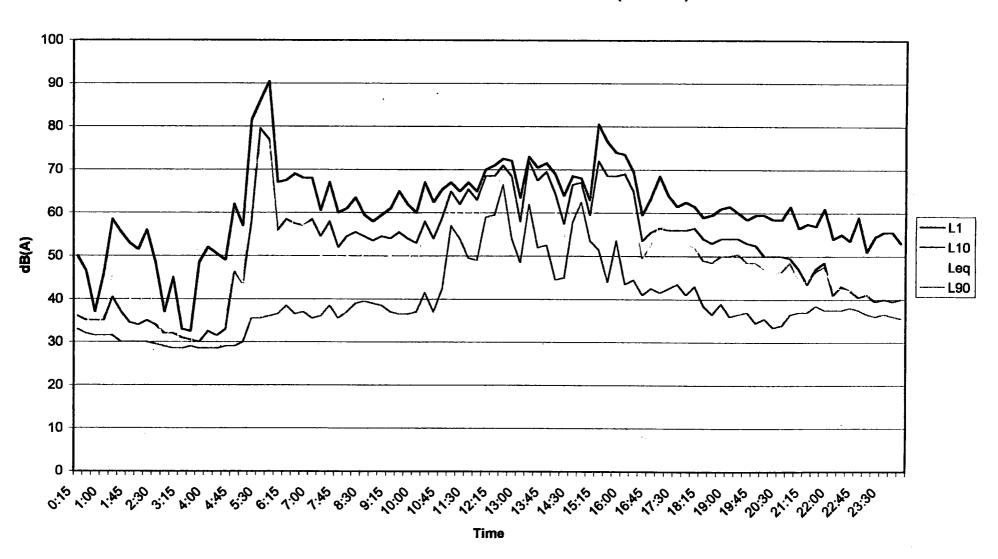
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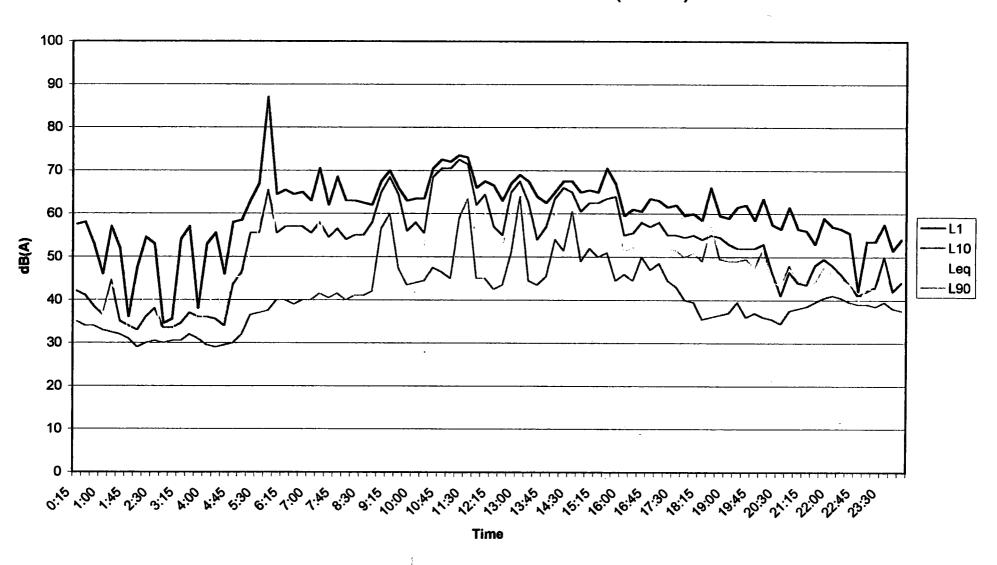
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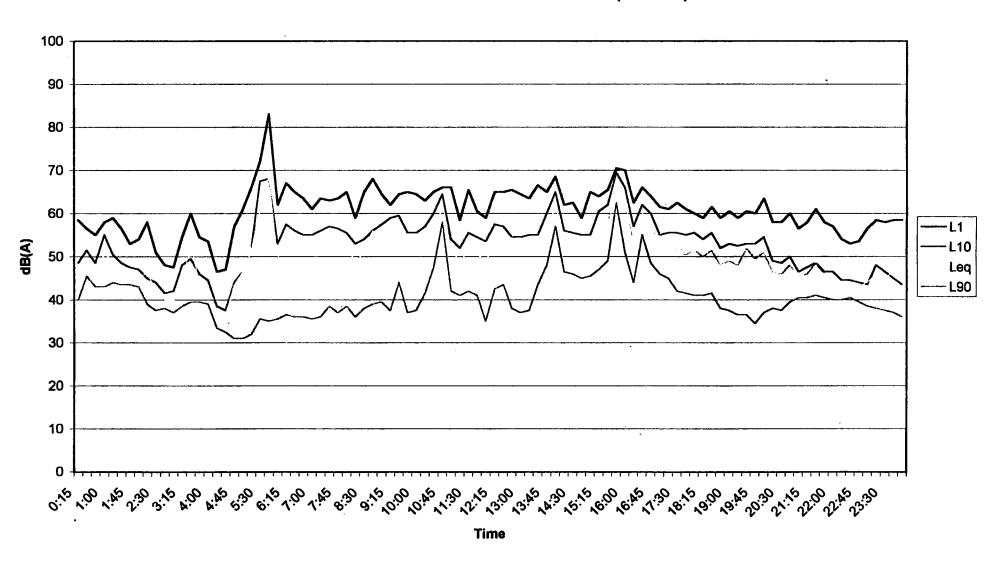
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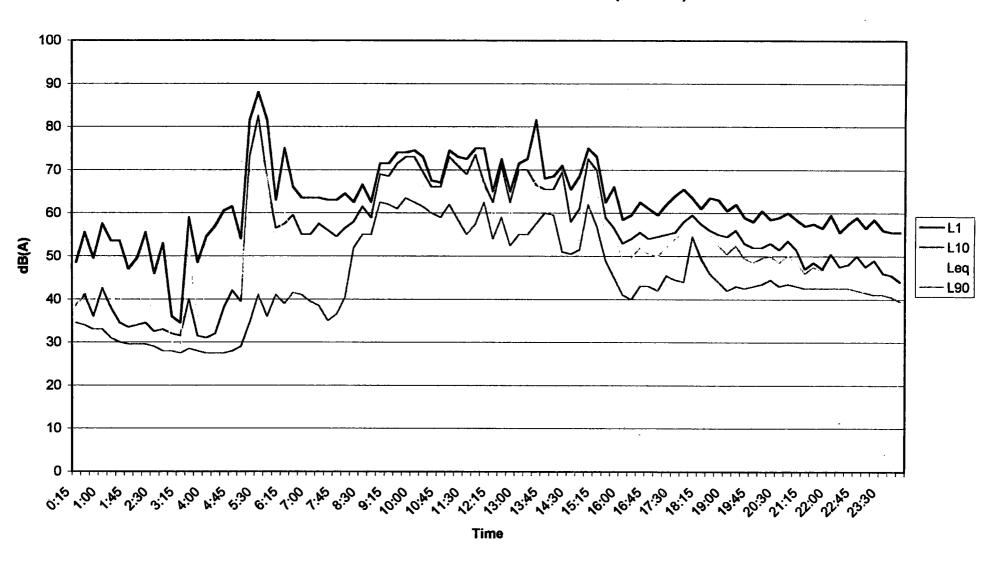
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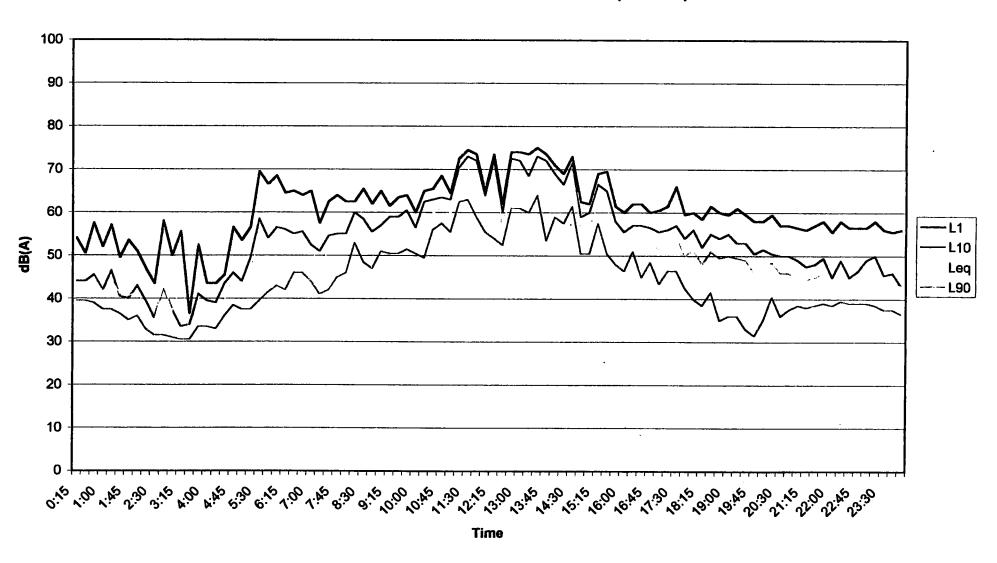
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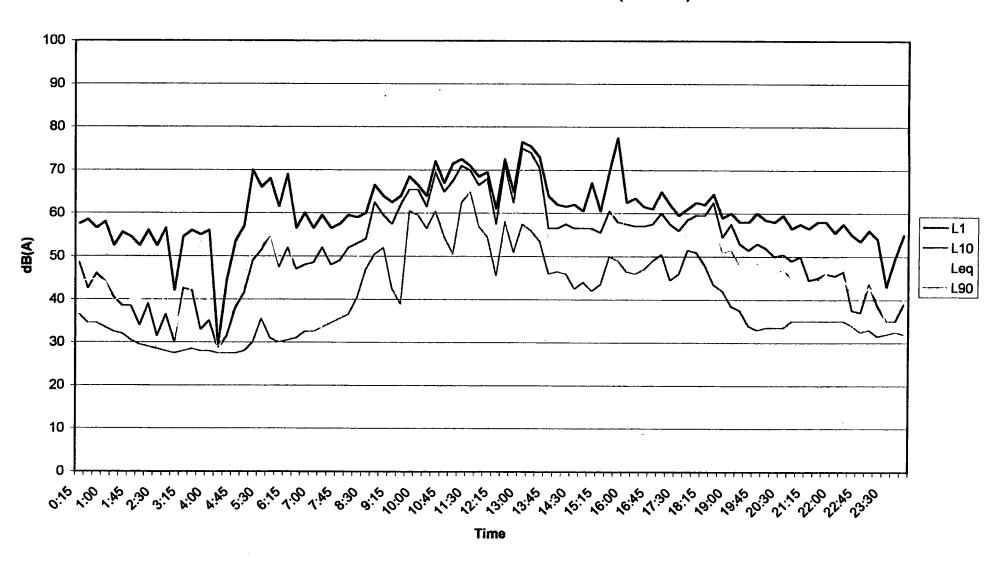
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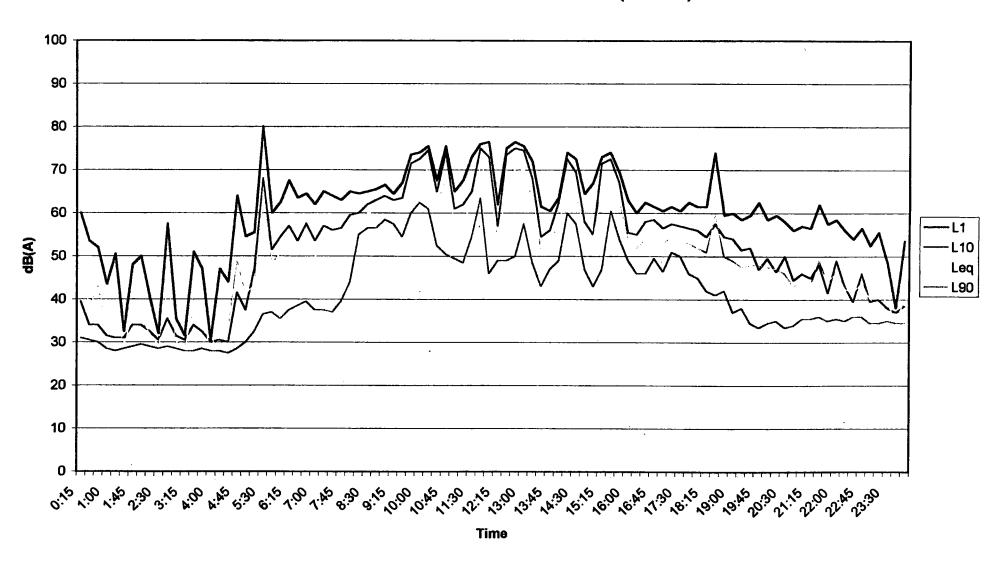
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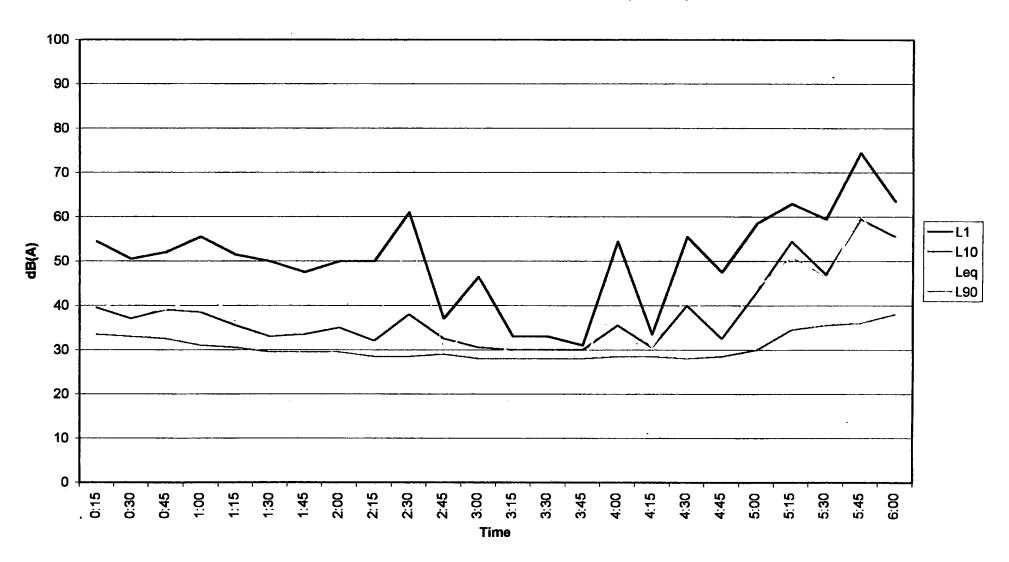
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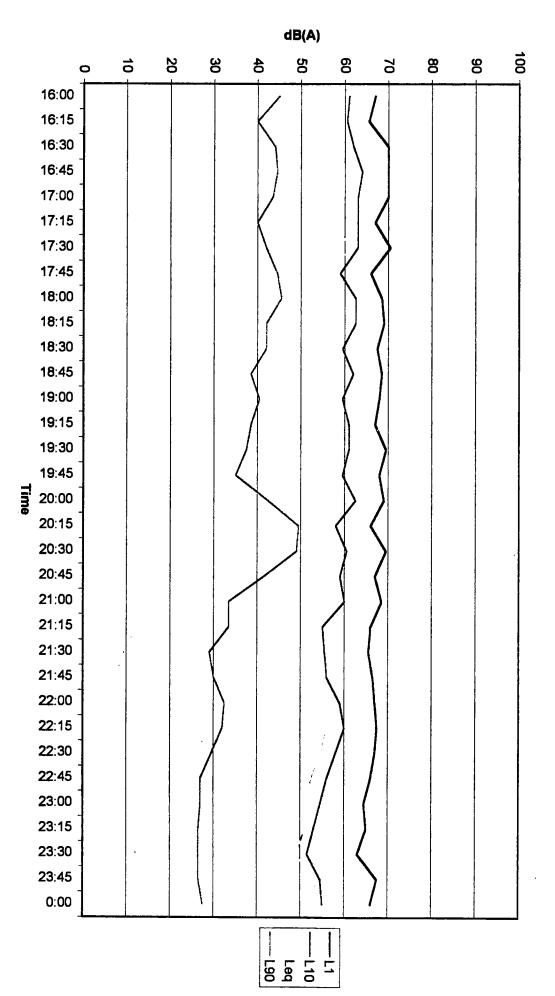
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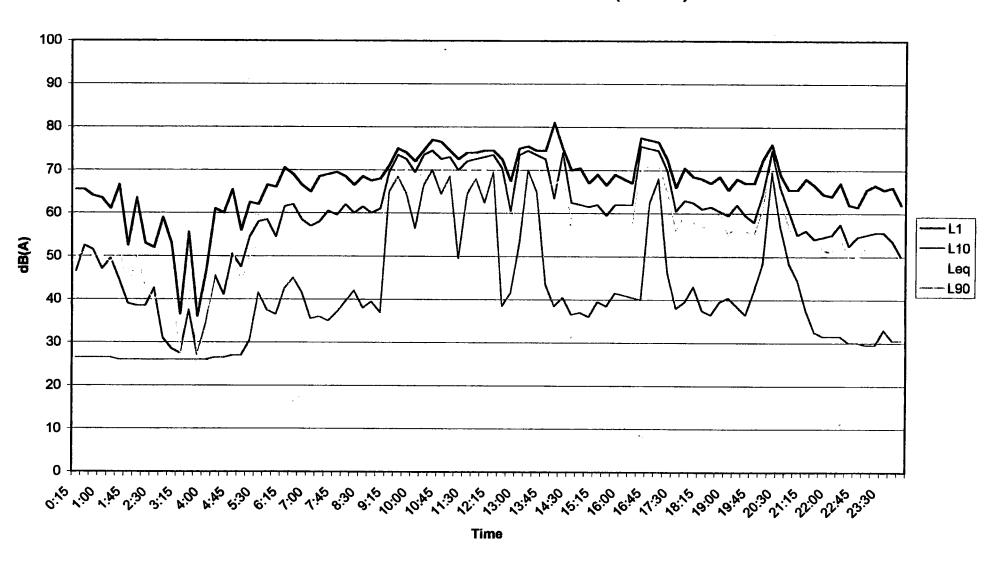


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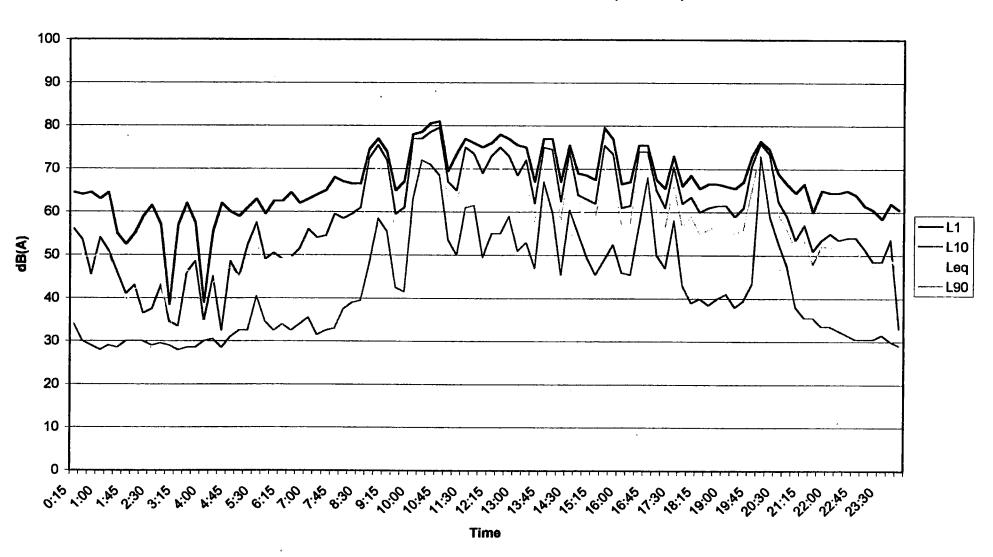


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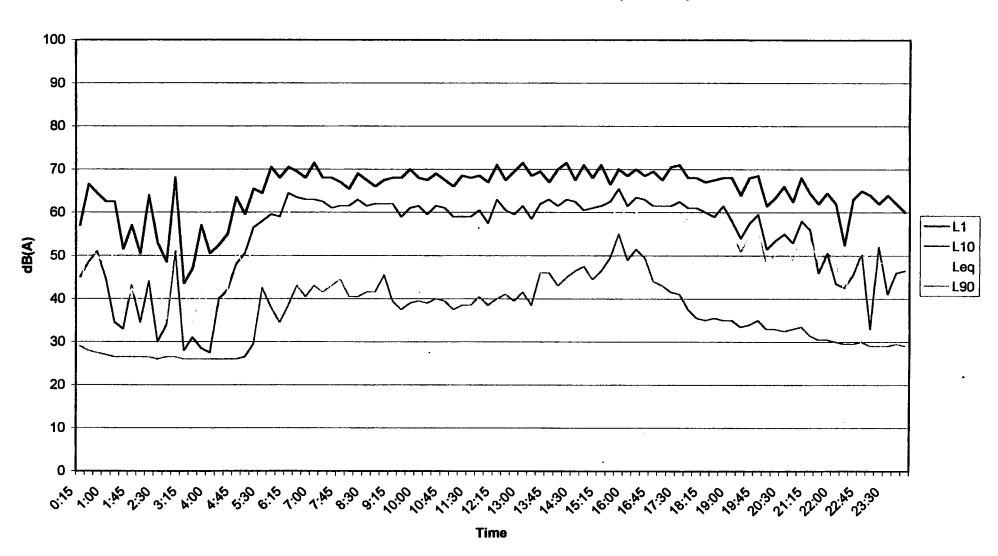
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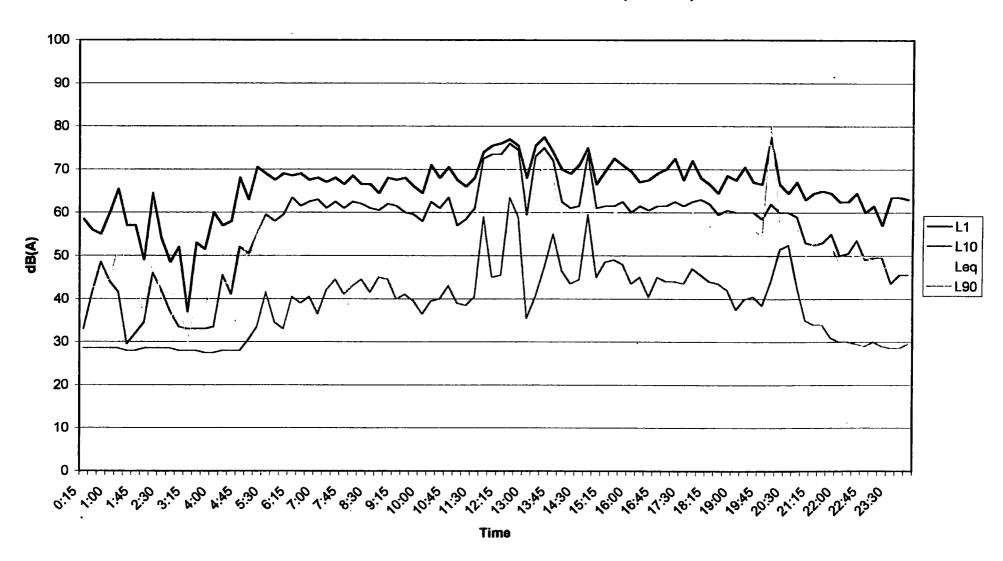
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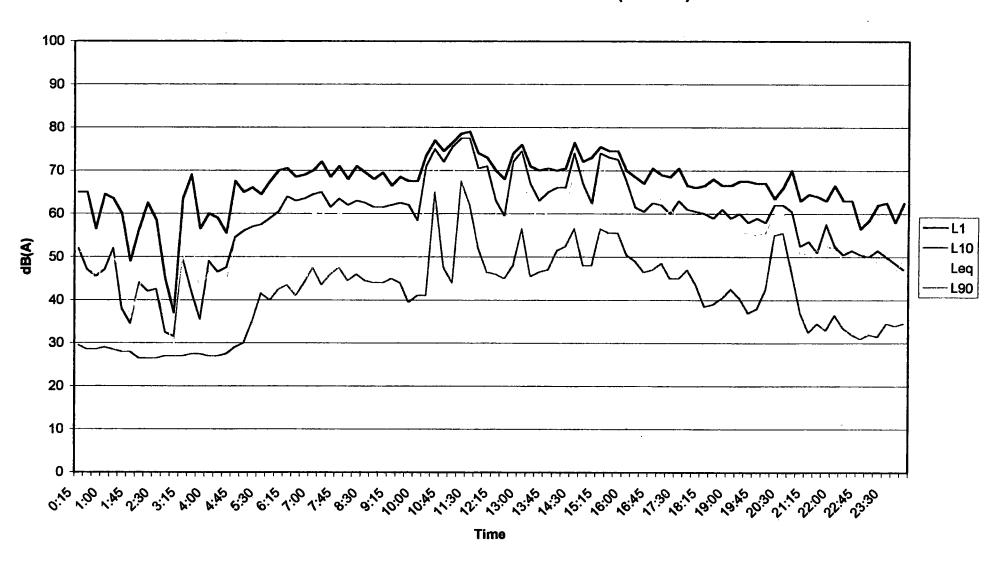
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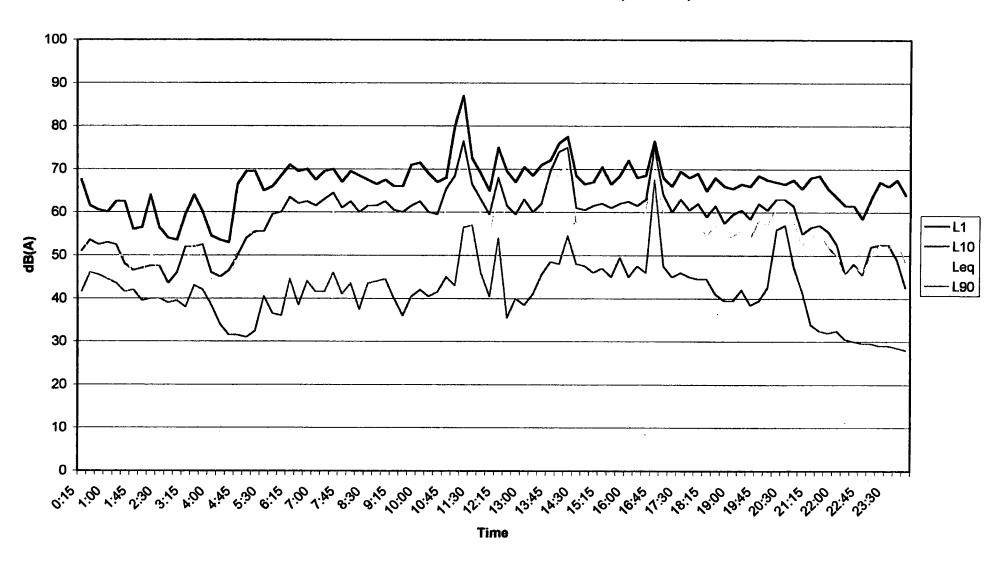
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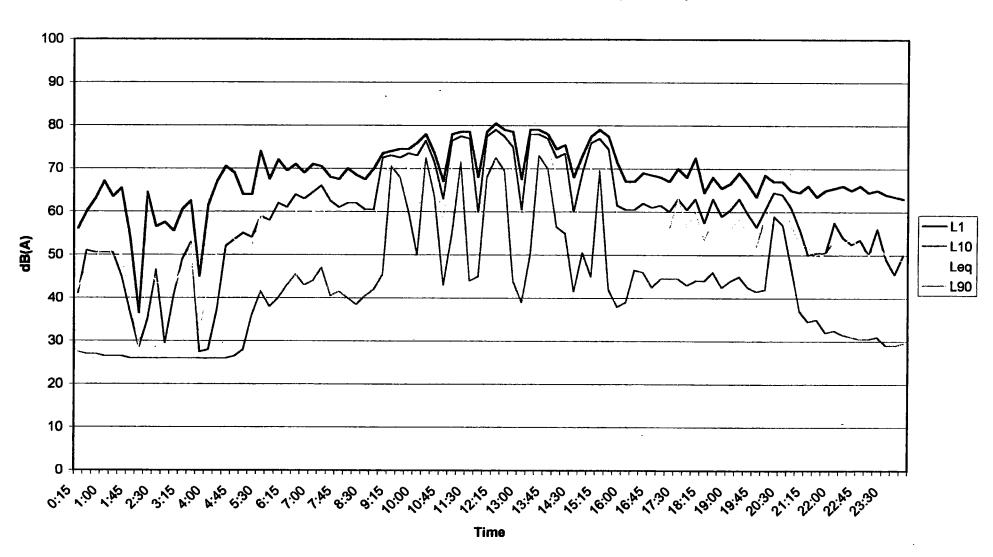
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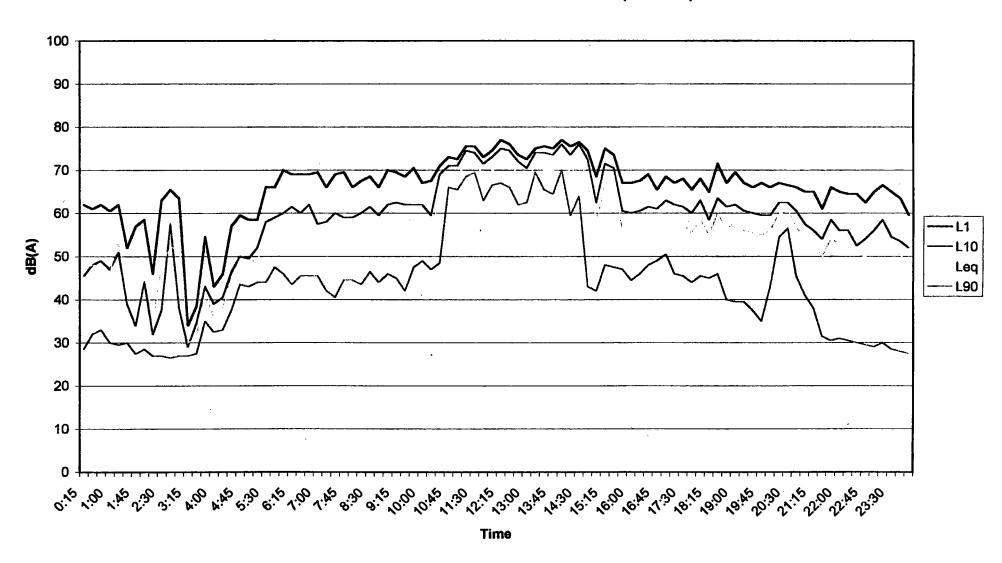
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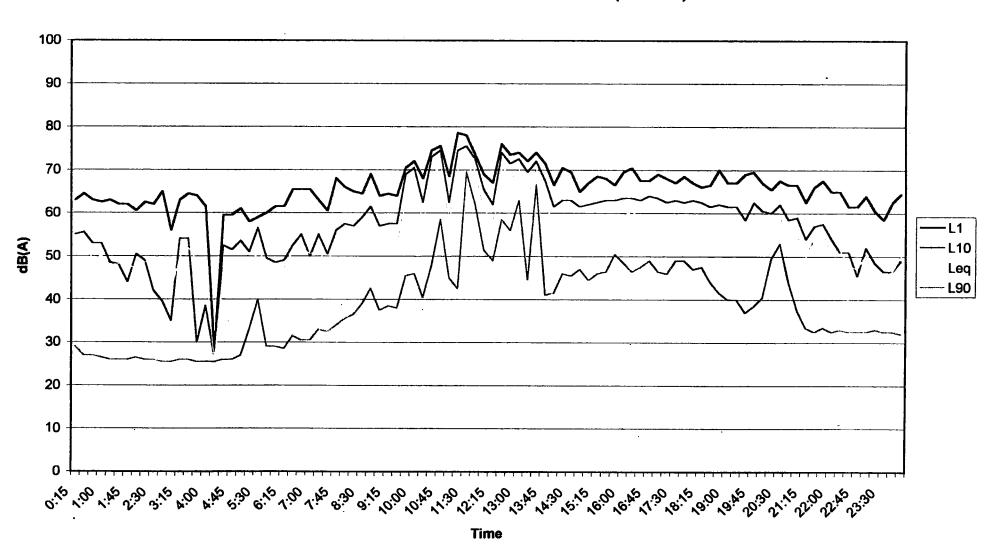
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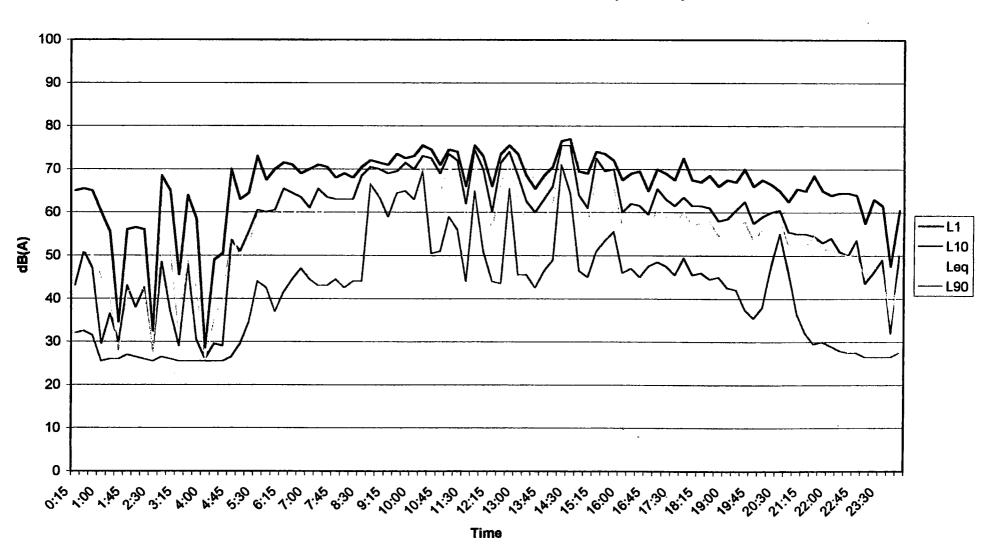
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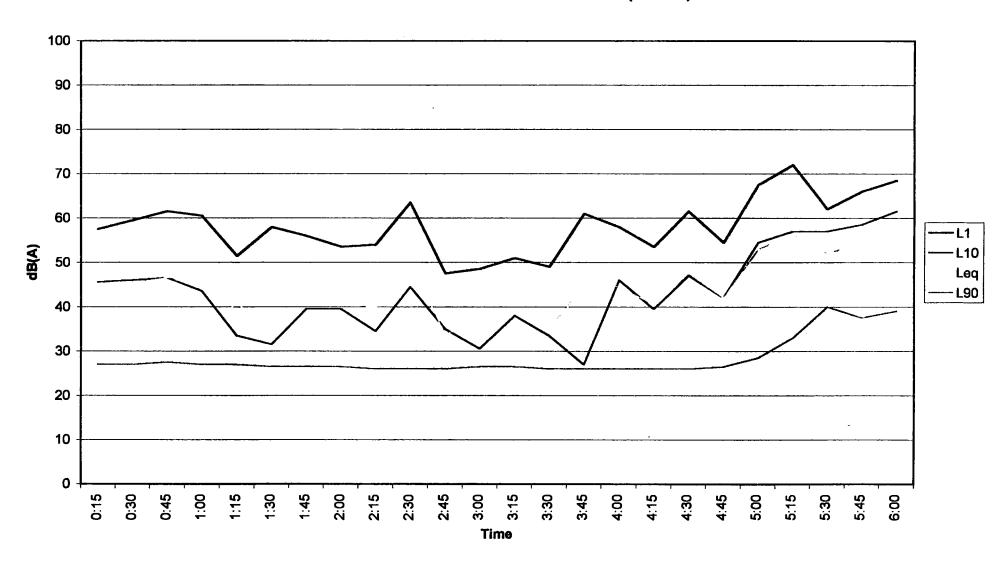
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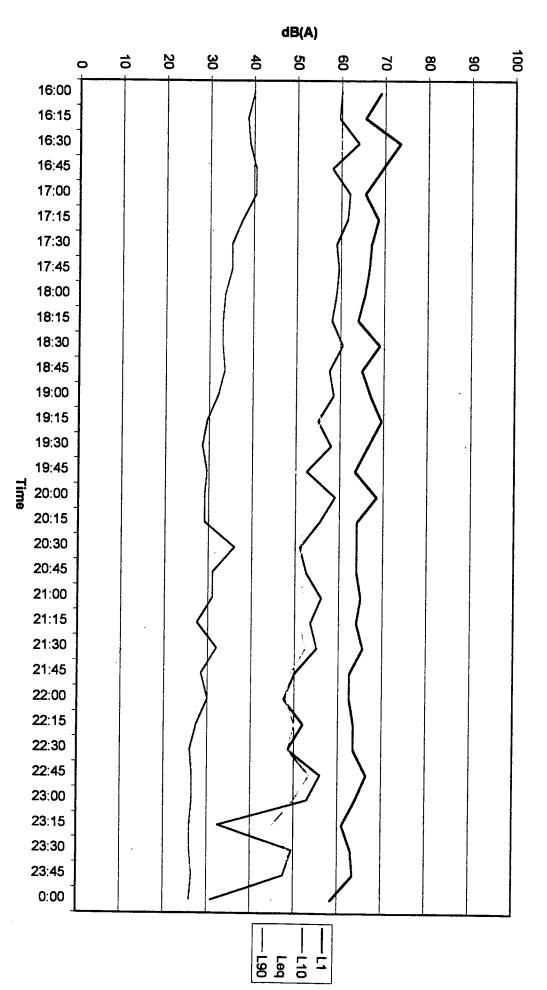


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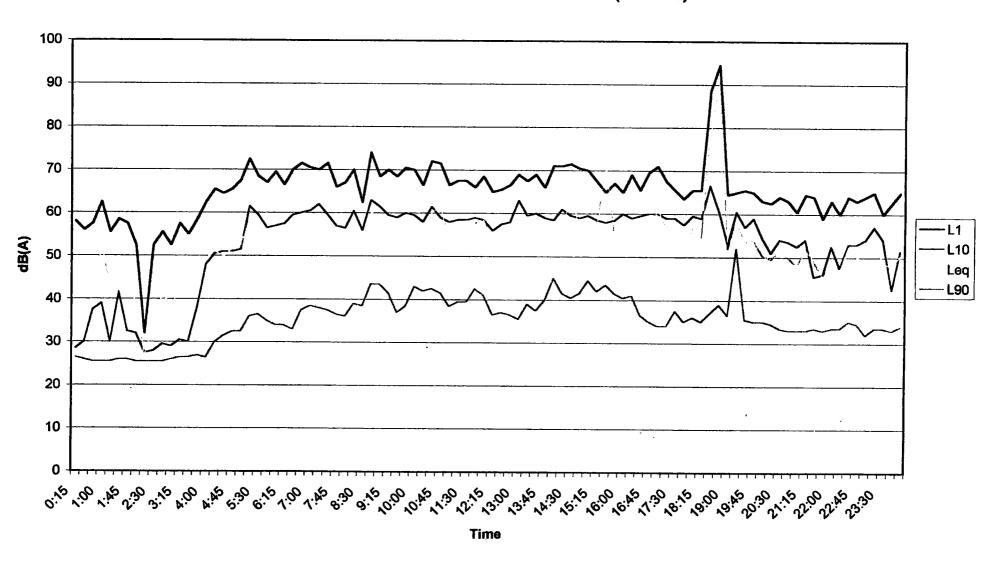
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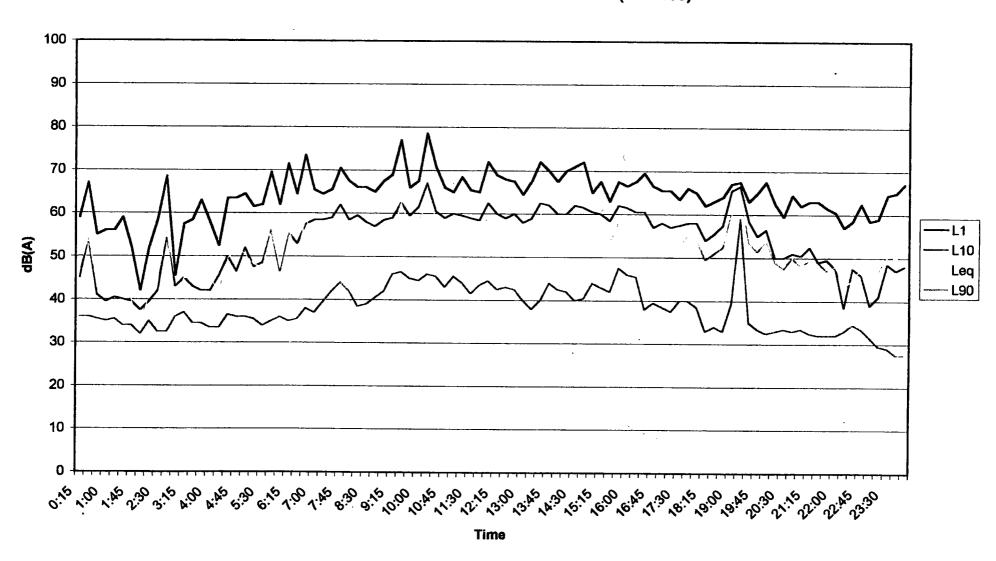


Noise Measurement Results - Location F (20/11/98)

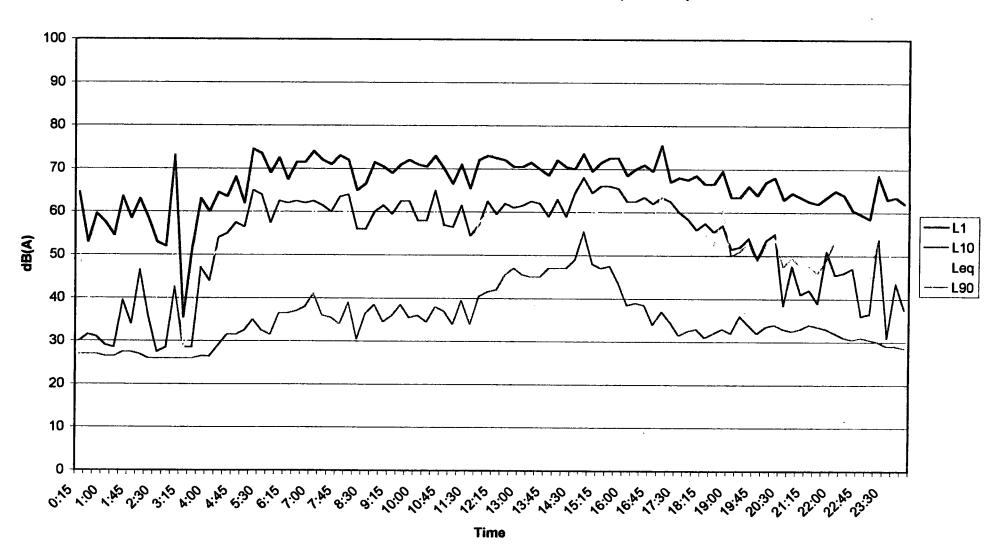
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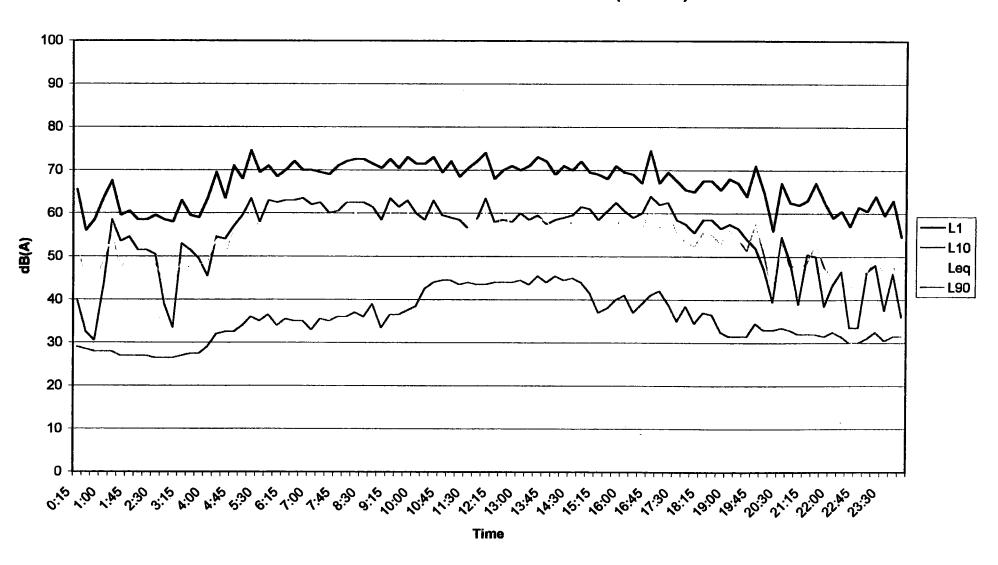
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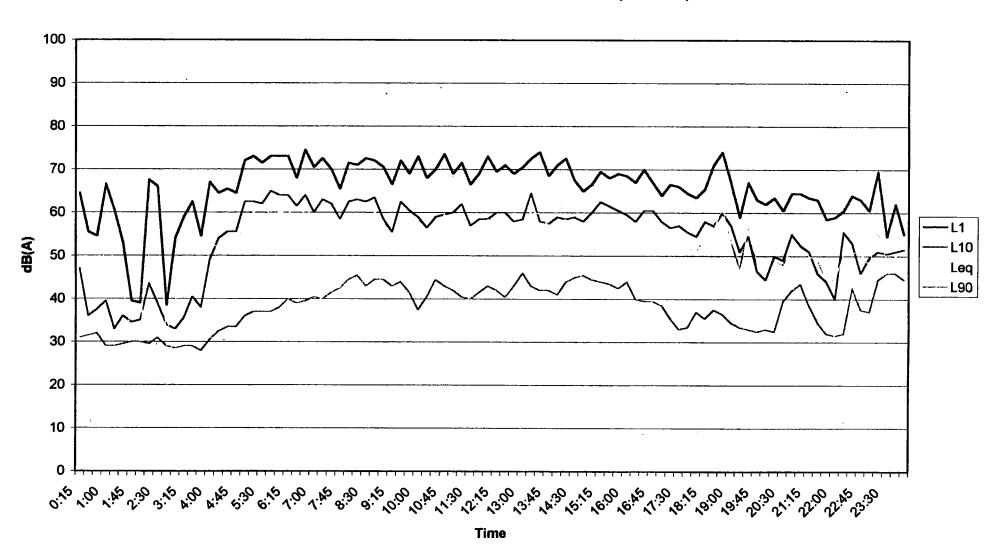
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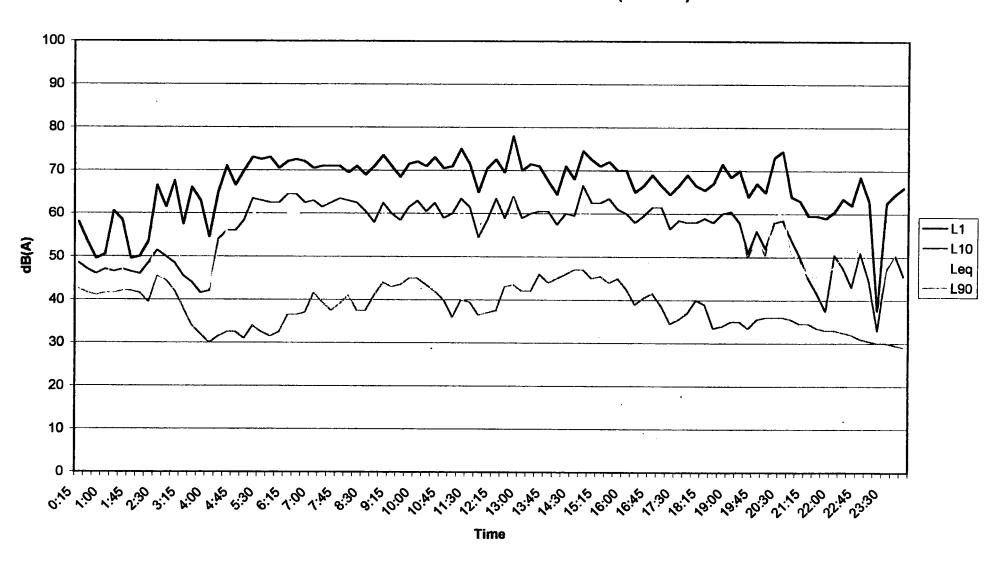
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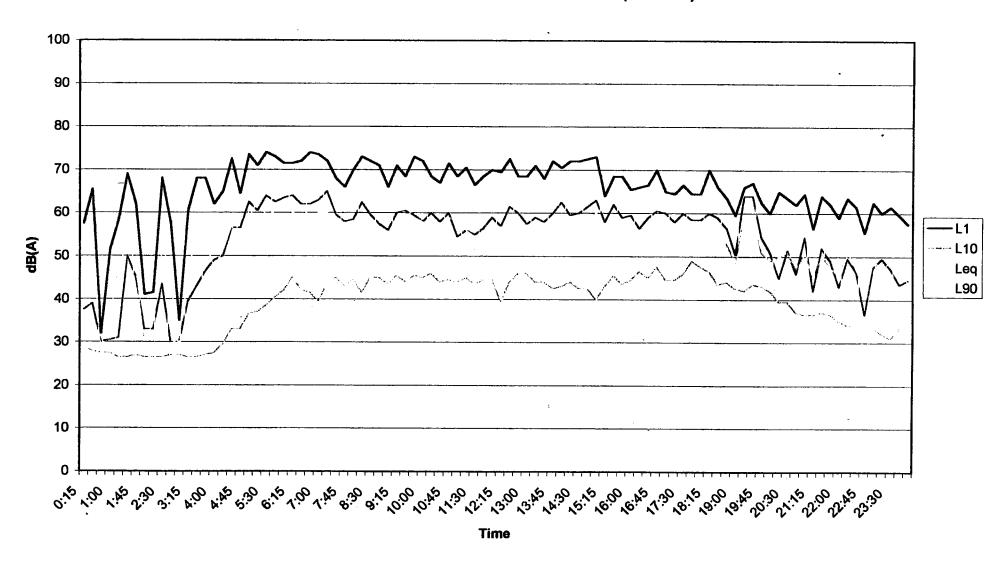
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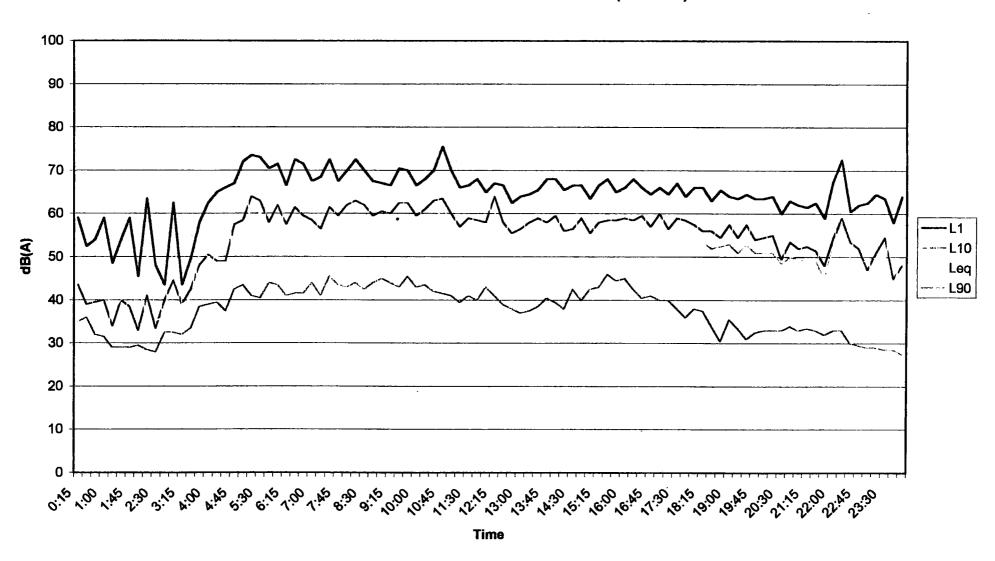
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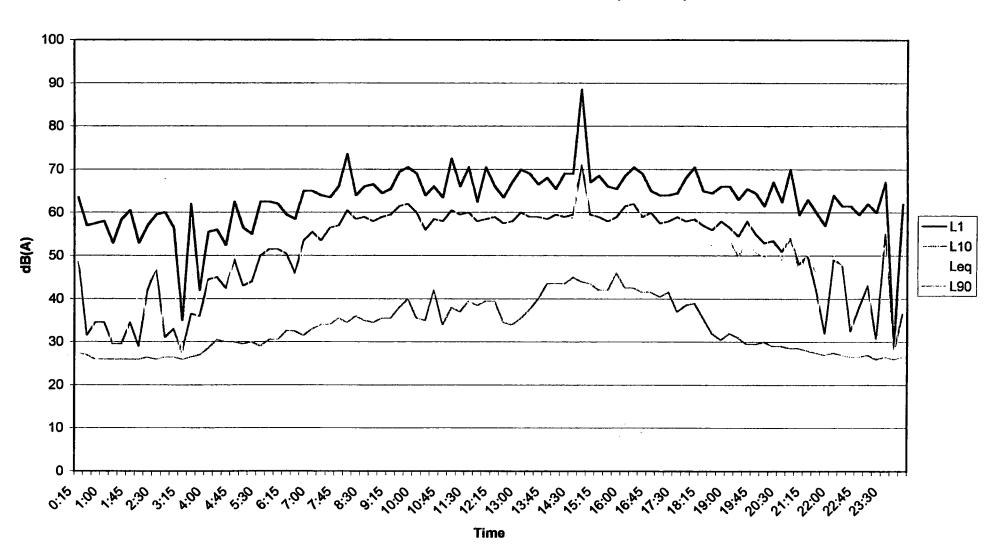
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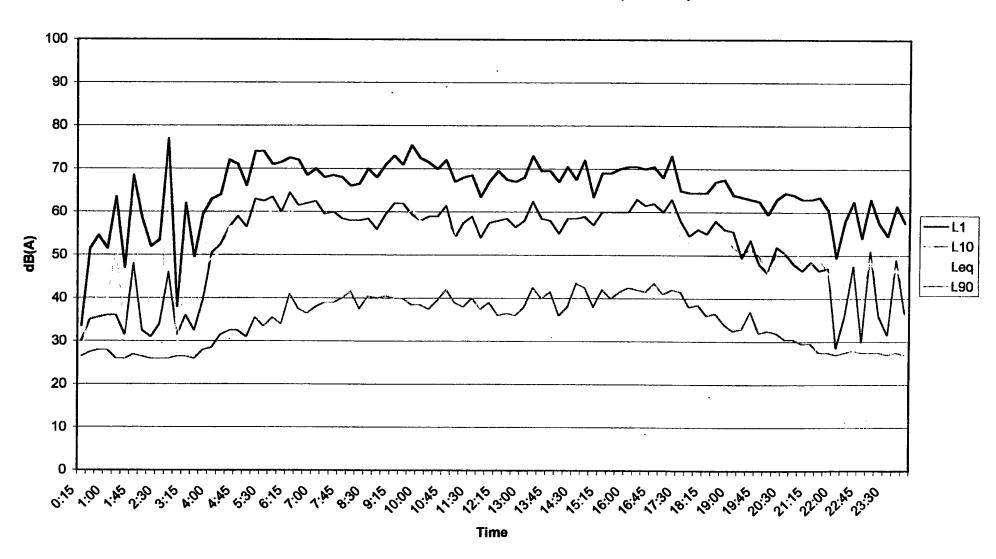
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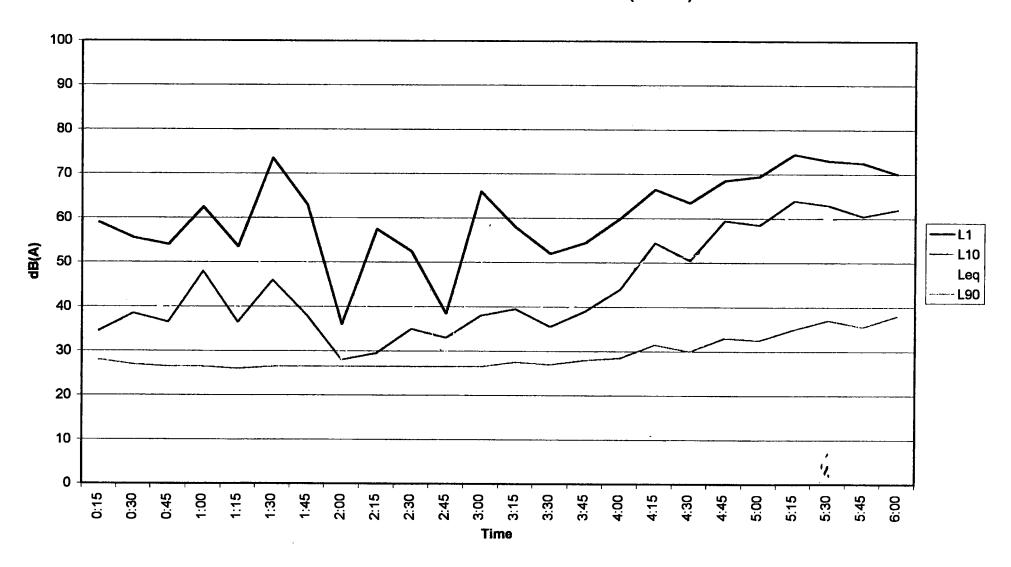
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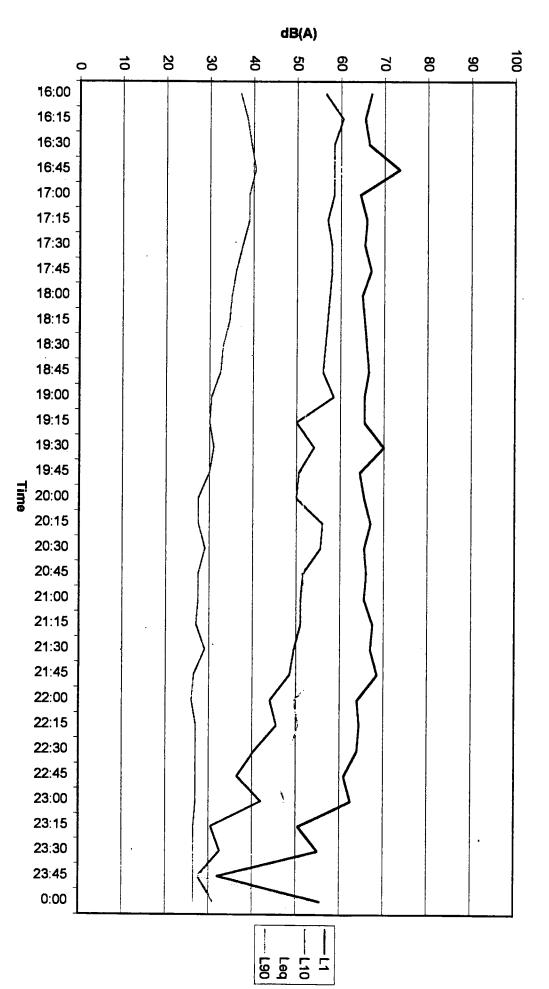


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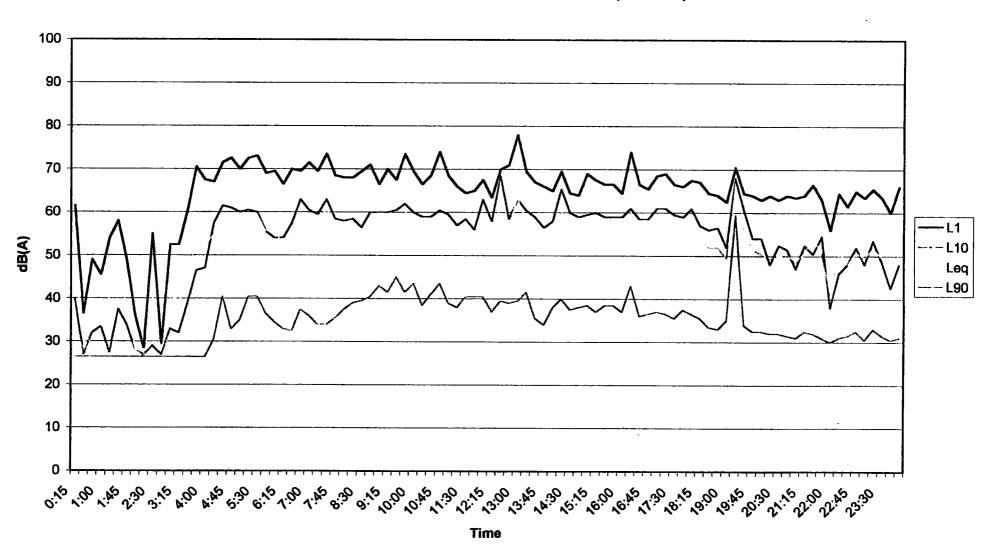
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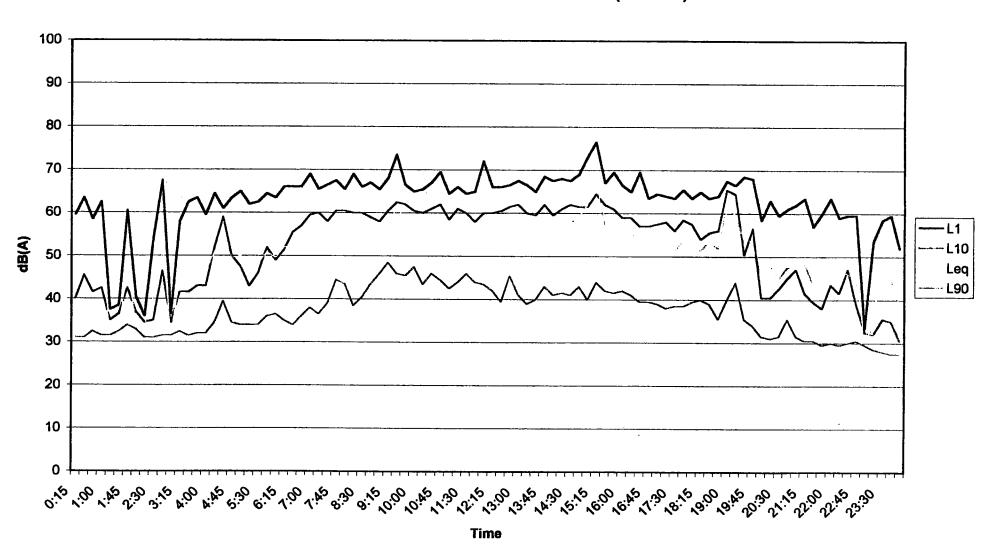


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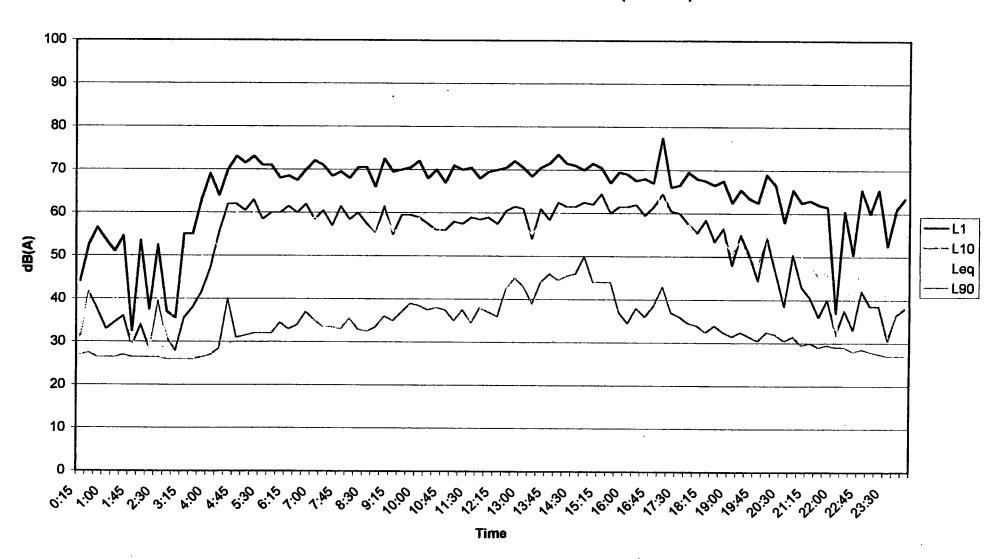
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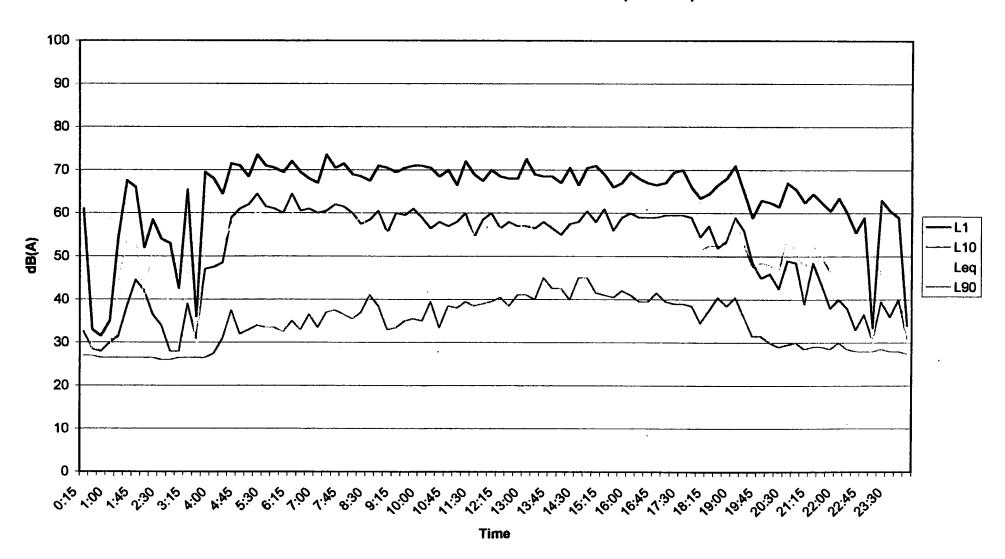
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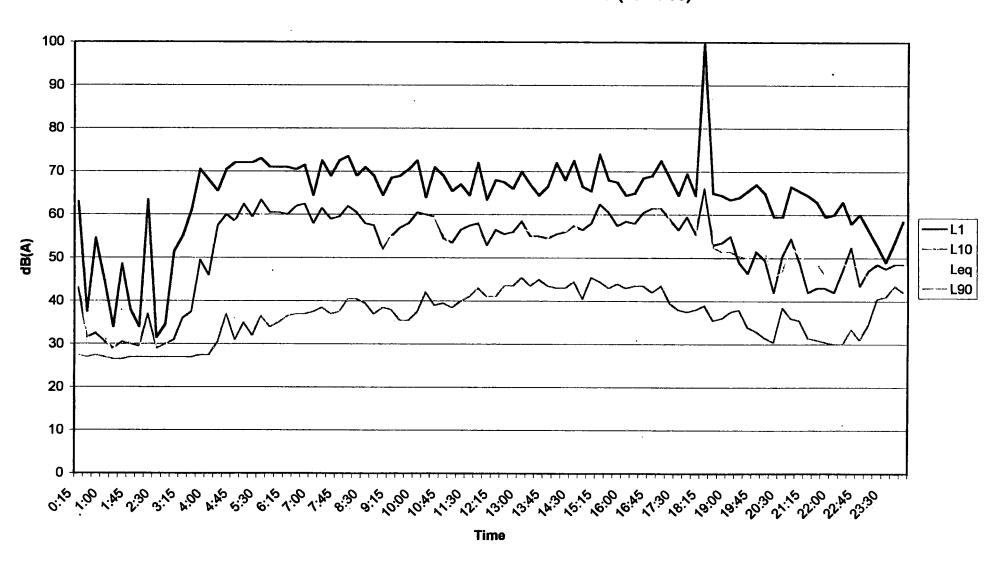


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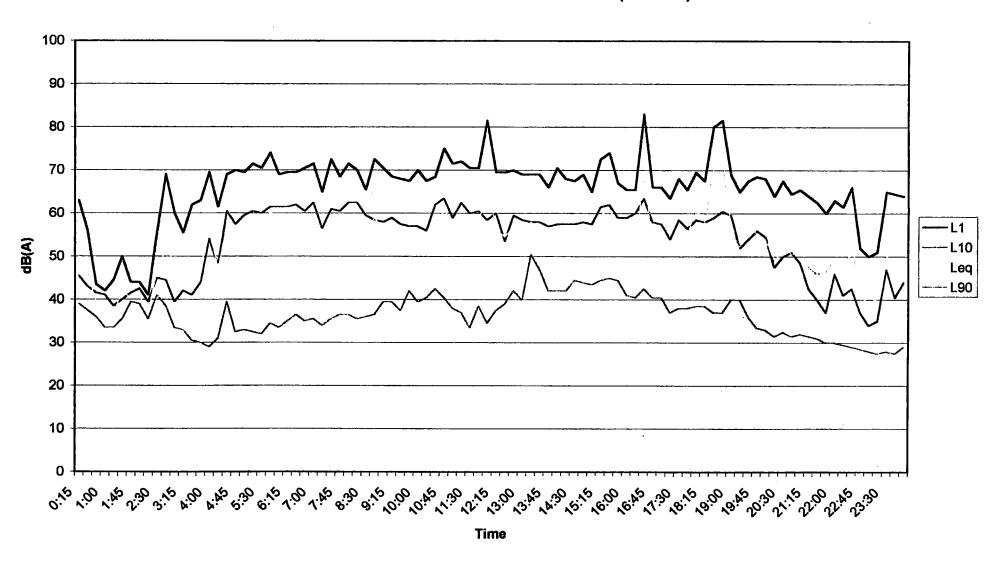


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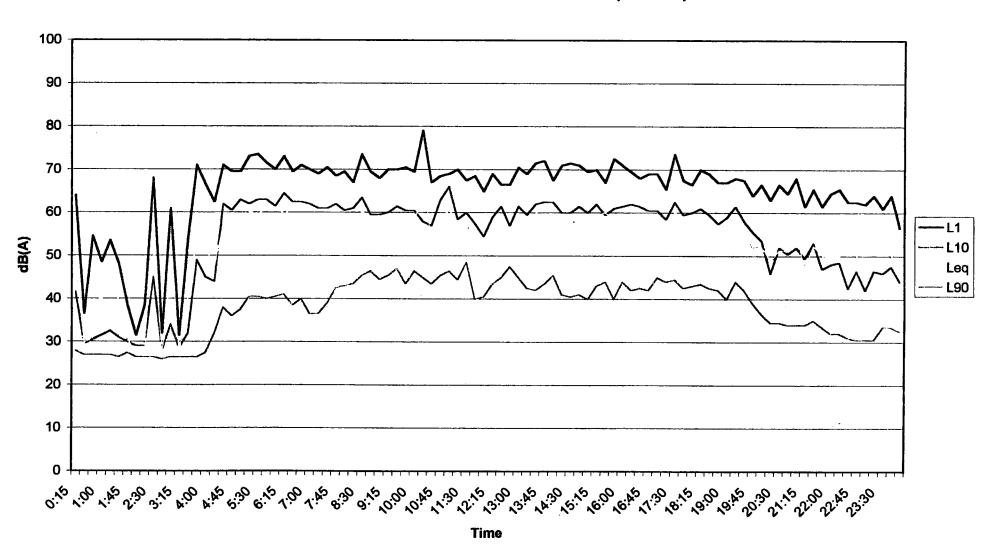
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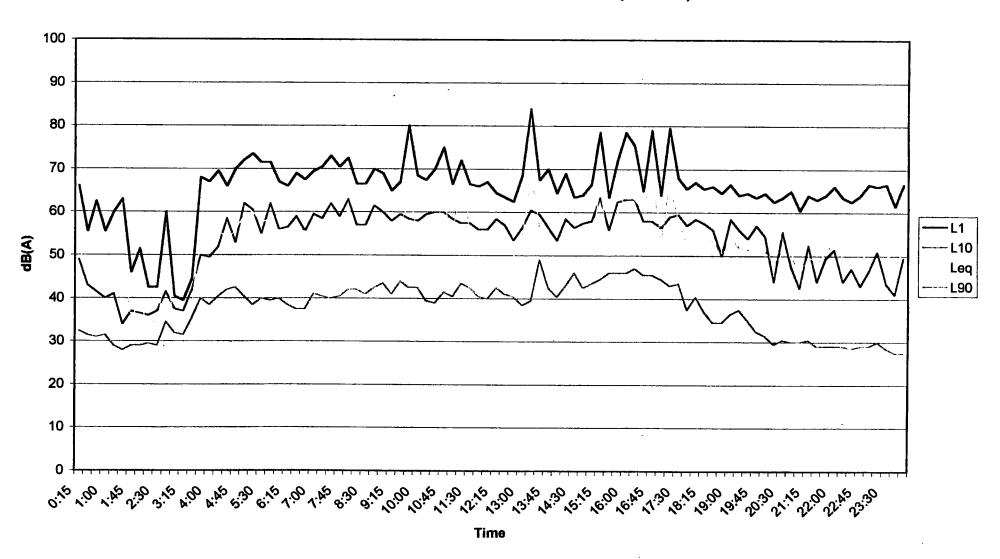
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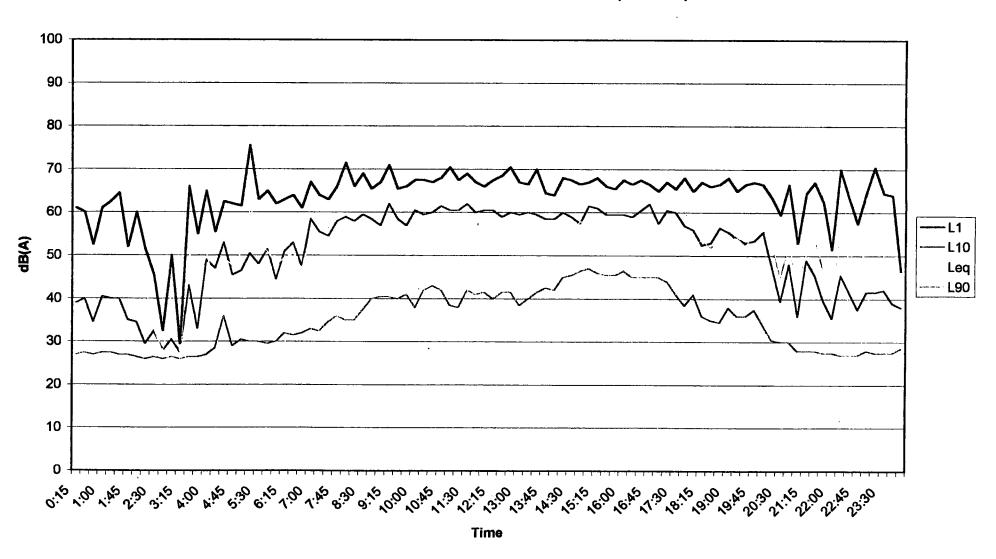
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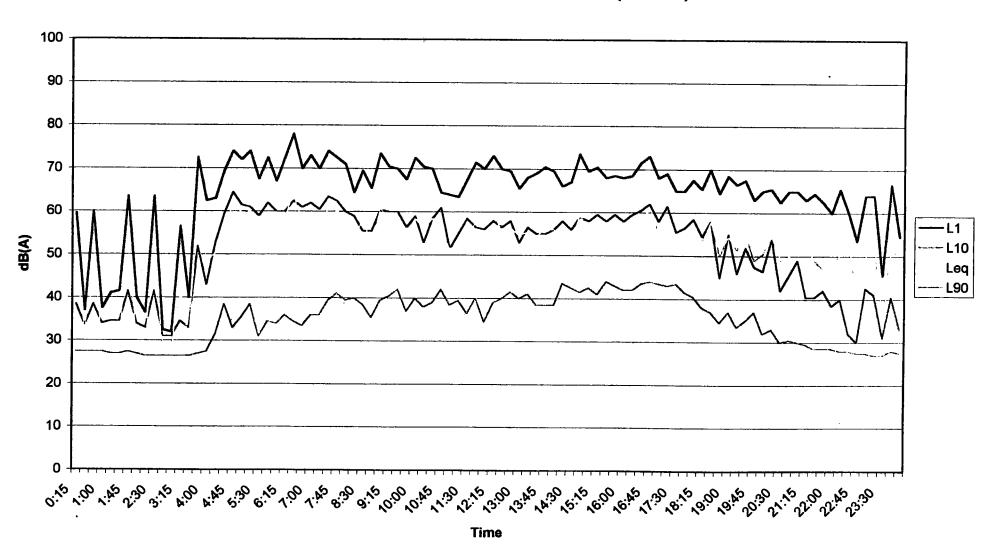
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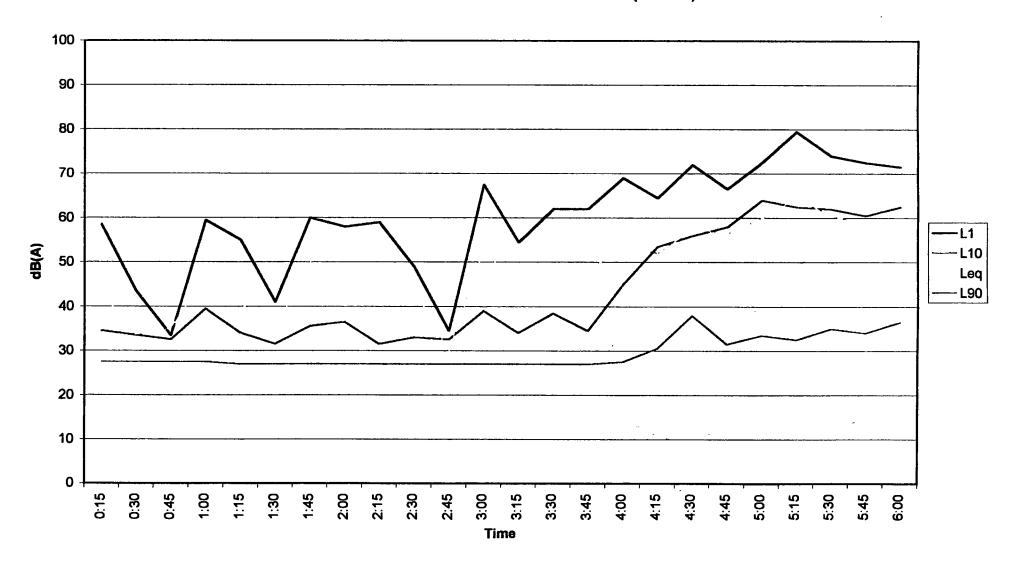
## Noise Measurement Results - Location G (29/11/98)



# Noise Measurement Results - Location G (30/11/98)



# Noise Measurement Results - Location G (1/12/98)



# Appendix C5 – Groundwater Impact Assessment

- 1 INTRODUCTION
- 2 SCOPE
- 3 EXISTING GROUNDWATER SYSTEM
- 4. POTENTIAL IMPACTS ON GROUNDWATER SYSTEM
- 5. GROUNDWATER MANAGEMENT
- 6. REFERENCES

4

Prepared by: Lyall and Macoun Consulting Engineers

# GROUNDWATER IMPACT ASSESSMENT LOTS 196 AND 29, NORTH MAROOTA

## Prepared for

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Job No.: OW560	Date: 16-Feb-99	Principal: TWM
File: J:/OW560/DixonExt.doc	Rev No: 4.0	Reviewer: TWM

#### **Table of Contents**

1. INTRODUCTION	.C5.2
2. SCOPE	.C5.2
3. EXISTING GROUNDWATER SYSTEM	05.0
3.1 Regional Geology and Groundwater System	
4. POTENTIAL IMPACTS ON GROUNDWATER SYSTEM	
4.1 Extraction on Lot 196 and Portion 29	
5. GROUNDWATER MANAGEMENT	.C5.8
6. REFERENCES	.C5.8
TABLES AND FIGURES	
FIGURE 1 - GROUNDWATER MONITORING	C5.
TABLE 1 - GROUNDWATER MONITORING LOCATIONS - NORTH MAROOTA	.C5.4
TABLE 2 - NORTH MAROOTA GROUNDWATER SYSTEM – GROUNDWATER TABLE	E.C5.5
TABLE 3 - DIXON SANDS MONITORING BORES	C5 5

#### 1. INTRODUCTION

Maroota is an Aboriginal word meaning "place of many springs". In the Stage 1 report of the Maroota Groundwater Study (DLWC, 1996), the study is introduced by

"Groundwater drawn from springs, excavations and bores has long been an important resource that has sustained both the community and the natural environment in the area".

This report analyses what is known of the groundwater situation generally and provides some early interpretive assessment of the groundwater situation in the North Maroota area, based principally on data from:

- Three site monitoring piezometers that have been established by Dixon Sand
- The results of the Stage 2 Groundwater Study

Dixon Sand has already taken the step of installing three groundwater monitoring bores or piezometers on the existing extraction site and neighbouring sites. Three bores have been licensed as monitoring bores.

#### 2. SCOPE

The objectives in respect to groundwater management are identified in DCP 500 (BHSC, 1997), from 2.4 Water Resources, as:

- "To conserve the integrity and quality of the groundwater resources of the Shire
- To protect groundwater dependent eco-systems and natural habitats"

DCP 500 also sets out the following "Performance Criteria", requiring proponents to determine:

"the likely impact upon the groundwater and (to) nominate an effective freeboard above wet weather high ground water level capable of conserving water flow patterns and water quality on each extraction site".

and prescribes the preparation of a Groundwater Impact Assessment Report which should:

- "Identify and classify aquifer systems
- Identify all groundwater dependent land uses and environments within catchment areas
- Assess vulnerability of groundwater
- Identify freeboard level above high groundwater level capable of protecting groundwater flow patterns and water quality
- Identify potential sources of impacts including seepage from tailings dams, and
- Outline procedures for monitoring groundwater flow and quality"

#### DCP 500 also requires that:

- "Extraction should not occur within 2 metres of the wet weather high ground water level or otherwise to the requirements of DLWC
- Proponents should ensure that all bores and extraction operations which intercept the groundwater table and/or require pumps, meet the requirements of DLWC
- Proponents may be required to install groundwater monitoring bores as a condition of the consent"

State Government requirements, in respect of groundwater, are also specified as follows:

- the need to establish the watertable level (DLWC)
- the protection of groundwater (HNCMT)
- the impact on groundwater and the location of the watertable (EPA)

The location of the excavations, bore holes and natural springs in the area of North Maroota which can all provide data on the groundwater system, are shown in **Figure 1**, Groundwater Monitoring.

This report is based on an interpretation of available existing information and the development of a monitoring and management strategy that will develop over time.

The report's contents are as follows:

- Section 3 Existing Groundwater System
- Section 4 –Potential Impacts on Groundwater System
- Section 5 Groundwater Management

#### 3. EXISTING GROUNDWATER SYSTEM

#### 3.1 Regional Geology and Groundwater System

#### Introduction

The Maroota Groundwater Study was commenced in March 1996, following concerns over declining flows in established bores and from natural springs. The suspicion was that the changes were due to the rapid expansion of sand mining that had occurred in the early 1990s.

There were four stages outlined for the Groundwater Study. To date Stages 1 and 2 had been completed, with Stage 3 underway. The scope of the various stages is:

- Stage 1 Review available data on hydrogeology of the area and select three sites for monitoring
- Stage 2 Establish the monitoring network
- Stage 3 Assess seasonal and other fluctuations in water levels

Stage 4 will see the preparation of the Groundwater Management Plan, based on a two year monitoring program.

The study is being co-ordinated by the Department of Land and Water Conservation and prepared for the Hawkesbury Nepean Catchment Management Trust.

#### Geology

The base rock in the area is Hawkesbury Sandstone, which in its upper profiles, can be highly weathered and present as soft and friable rock that is easily ripped, but is nevertheless a consolidated rock deposit.

In the original work by Etheridge (1980), the weathered Hawkesbury Sandstone was given a name of an eluvial sand (an "in place" weathered material). It is now generally not referred to as a separate horizon of different age but simply as a continuous upper horizon of the Tertiary sandstone. It varies in thickness up to 15 metres with an average depth of around 10 metres.

The Hawkesbury Sandstone was laid down during the Triassic Period. Overlying the Hawkesbury Sandstone is a principally unconsolidated deposit of sand, deposited under fluvial conditions during the Tertiary Period (2 to 65 million years ago). The Maroota Sand occupies most of the settled area of Maroota either side of Wisemans Ferry Road, and between Old Northern Road and Old Telegraph Road. It varies in thickness up to a maximum of 39 metres at the Maroota Trig.

#### **Groundwater System**

Groundwater occurs separately in the different sand types. The aquifer system is generally described by:

- A shallow aquifer in the Maroota Sands and weathered Hawkesbury Sandstone and generally at depths of up to 30 metres.
- A **deep aquifer** in the unweathered Hawkesbury Sandstone and at a considerably greater depth, of between 100 and 200 metres.

The shallow aquifer is the key aquifer. It is recharged quite quickly by infiltration after rainfall and is the aquifer feeding the various springs and seeps within the area. These seeps and springs are an important source of local water, not only for consumptive and other human uses but also because they provide riparian flows to the downstream drainage systems. The saturated thickness of the shallow aquifer is between 2 and 5 metres but can be up to 10 metres.

The water quality of this aquifer is good, characterised by an acidic pH, generally between 4.5 and 5.5, and a low salinity, generally in the range of 30 to 60 mg/L (less than 100 S/cm).

From springs, the water quality is marginally different, with the pH being lower (4 to 4.5) and salinity being higher, up to 120 mg/L.

The deep aquifer has generally been little utilised in the past. The Maroota Groundwater Study will however monitor the behaviour of both aquifers.

From the deep aquifer, the pH is generally neutral to slightly alkaline but the salinity is higher, being generally in the medium range of 175 to 500 mg/L.

#### 3.2 Local Groundwater System

In the North Maroota area, there are a number of natural springs, excavations and a variety of monitoring bores. Details are set out in **Table 1**, Groundwater Monitoring for the area of North Maroota east of Old Northern Road. It is a collation of information, both from the Stage 1 and 2 Maroota Groundwater Studies as well as available local information. Locations are shown on **Figure 1**, Groundwater Monitoring.

Table 1
Groundwater Monitoring Locations - North Maroota

No.	Туре	Övner	Location	Monitoring Yes/No
DS2	Bore	Dixon Sand	Lot 1, DP 547255	Yes
DS3	Bore	Dixon Sand	Lot 2, DP 547255	Yes
DS1	Bore	Dixon Sand	Lot 196, DP 752025	Yes
S18	Spring	Manaldo	Lot 196, DP 752025	No
S19	Spring	Manaldo	Lot 196, DP 752025	Can't locate
S17	Excavation	M Accurso	Lot 117, DP 752025	No
PF 1,2 & 3	3 Bores	PF Formation	Lot 2, DP 595538	Yes
B60751	Bore	N.K.	Lot 3, DP 595538	Can't locate
S22	Spring	N.K.	N.K. Corner Crown road/Old Northern Road	
S21	Excavation	M. Taouk	Lot 2, DP 547255	No
B16378	Bore	N.K.	Lot 76, DP 752025	Can't locate
B48741	Bore	N.K.	Lot 2, DP 590937	Blocked

Note: NK = not known

The Dixon Sand bores were drilled in August 1998. The bores were drilled as observation bores by Ground Test Pty Ltd.

The standing water level has been monitored over the 4 to 5 months since the bores were drilled.

For the other excavations, springs, etc. listed in **Table 1**, the levels of the free standing watertable are either being monitored or spot checks were taken for this report. Most are on adjacent landholdings. The groundwater details are contained in **Table 2**, North Maroota Groundwater System

# Table 2 North Maroota Groundwater System (Shallow Aquifer) Groundwater Data

Properties	Groundwater Table Data
Lot 196, DP 752025	DS1, 158 m AHD – see Table 3
	• S18, <b>156.2 m AHD</b> (approx.)
Lot 29, DP 752025	Deep excavation to 168 m AHD approx. – only minor groundwater shows as perched
	watertables; no interception of shallow aquifer
Lot 117, DP 752025	Deep excavation, 171 m AHD approx.
Lot 2, DP 595538	• PF1, <b>180m AHD</b> (pH 4.8 to 5.8, EC 90 to 170µS/cm)
	• PF2, 180m AHD (pH 5.3, EC 400 to 500µS/cm)
	• PF3, <b>177m AHD</b> (pH 4.4 to 5.6, EC 110 to 420μS/cm)
Lot 2, DP 547555	DS3, 169m AHD – see Table 3
Lot 1, DP 547555	DS2, 179m AHD – see Table 3

The three Dixon bores have been monitored since September 1998. **Table 3** provides the standing water level data. The bores are located;

• DS1 - S edge of worked area of Lot 196 (166.54m AHD)

DS2 - N edge of Lot 1

(195.37m AHD)

• DS3 - W part of Lot 2

(187.42m AHD)

The levels in parentheses are the ground level at each bore.

Table 3

Dixon Sand's Monitoring Bores

	Bore SWL (m AHD)					
Date	DS3		DS2		DS1	
	Depth	Level	Depth	Lovel	Depth	Level
29/9/98	18.76	168.66	16.60	178.77	8.70	157.84
6/10/98	18.73	168.69	16.64	178.73	8.71	157.83
14/10/98	18.73	168.69	16.60	178.77	8.70	157.84
19/10/98	18.70	168.72	16.61	178.76	8.67	157.87
28/10/98	18.69	168.73	16.60	178.77	8.66	157.88
21/12/98	18.63	168.79	15.90	179.47	8.92	157.62
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In addition to the above data, in Stage 2 of the Maroota Groundwater Study there have been multiple monitoring piezometers established at three sites within south and central Maroota. Site 2 is located some 1.5 km south east of Lot 196. Three piezometers are located at Site 2, namely:

- 75001
- 75002/1

#### • 75002/2

The latter two are shallow bores located between two local excavations. The piezometers are to be used to monitor the behaviour of the aquifer within the Maroota Sands, which, at this location, has a depth of about 25 m. From monitoring to date the standing water level (within the shallow aquifer) was between 178m AHD and 180m. AHD.

East of the shallow piezometers is the deep piezometer, 75001, where the depth of the Maroota Sand is 13.8 m, (which is showing that the sand is thinning to the east.)

(The Site 2 shallow aquifer watertable of around 180m AHD compares favourably with the Site 1 and Site 3 water tables, where it varies between 180m and 185m AHD. The Maroota Sand and Hawkesbury Sandstone interface is at a fairly constant and horizontal level of around 178m AHD, even though surface levels vary between the various sites between Sites 1 and 3 from 190m AHD to 250m AHD.)

Plotting these various results shows the groundwater table in the shallow aquifer appears fairly constant access the "top of the Maroota ridge" at approximately 180m AHD, or slightly less. Away from the high ground (with surface levels of around 200 m, AHD), the water table falls in level, generally in line with surface levels. Immediately to the east of Lot 196 it is approximately 170m AHD (Accurso - 171m AHD, DS3 - 169m AHD), and at the lower part of Lot 196, it drops to 158m AHD.

#### 4. POTENTIAL IMPACTS ON GROUNDWATER SYSTEM

#### 4.1 Introduction

Stages 1 and 2 of the Maroota Groundwater Study have, at this time, yielded little firm information on the potential impacts on the groundwater systems. This will only become clear after a number of years of monitoring.

Some of the early findings noted in the two reports are as follows (<u>emphasis has been added to identify comments related to sand mining):</u>

- The groundwater from the shallow aquifer is relied upon mostly during dry periods and surface water for other times. <u>As such, sand mining activities would seem to require comparatively little</u> <u>groundwater</u>.
- In the case of sand mining, it would be particularly important to verify (or disprove) this currently accepted level of groundwater use for that particular activity, remembering that although one operation might use a water supply source fed primarily from surface runoff, another might be more reliant upon groundwater for supply.
- None of the groundwater used for washing sand is expected to return to the aquifer. When water
  is extracted for sand washing purposes, it enters a closed system where the washed water is
  recycled. There are however, some evaporative loses and other minor loses due to leakage. The
  wash water is topped up from time to time to offset these loses.
- Anecdotal information suggests that irrigation is the largest consumer of groundwater, and that the shallow aquifer is used more extensively than the deep aquifer.

- Overall, excavations above the watertable are (at this stage) expected to have a minimal impact
  on the groundwater flow regime at the shallow aquifer. The capture of surface runoff may
  however impact upon established surface water patterns to streams.
- Over time, an excavation that once contained reasonably permeable sand is filled with fine
  grained, relatively impermeable material (when used as a tailings storage). This practice could
  effectively cap parts of the ground surface and has the potential to reduce or otherwise alter the
  pattern of recharge to the shallow aquifer, by restricting infiltration through the unsaturated zone
  through to the level of the watertable. There is a need to measure infiltration rate at the surface of
  backfilled operations to determine the extent of this potential problem.
- Should backfilling introduce a problem with regard to infiltration, it is important to keep in mind the
  cumulative impact increasing numbers of backfill operations will have. The total surface area
  covered by such backfill operations would be critical in this context. Once the pattern of recharge
  to the shallow aquifer is better understood, it can be established whether or not backfilling should
  be carried out, and if so, how this should be done.
- The base of all excavations made for the purpose of sand mining should be maintained at least 2 metres above the seasonally highest elevation of the shallow watertables.
- The use of 180 m AHD as an arbitrary limit on the depth of excavations should be discontinued.
- All groundwater users extracting significant amounts of groundwater, particularly those pumping from excavations which intersect the shallow aquifer, should be licensed and where practical, meters should be fitted to all high capacity pumps used to extract groundwater.
- Up to three piezometers should be installed on each site, depending on the number of water bearing zones encountered during drilling.
- Issues relating to interaction between aquifers and the two geological formations, and the impact
  of quarrying on them, have not been resolved.
- Compilation of data from all sources, including the private bores, needs some attention and the
  requirements of the Water Act in relation to private bores and the provision of data should be
  noted. These piezometers could aid in monitoring the sandstone section for the northern part of
  the study area, where water level data log is installed and maintained by the department.
- <u>It should be noted that the study has not specifically investigated the impact of sand mining on water resources in the area."</u>

#### 4.2 Impacts from Extraction on Lots 196 and 29

There is no evidence on either Lot 196 or Lot 29 of any prior or current excavation having intersected the shallow aquifer.

From the limited monitoring and anecdotal data assembled for this assessment it would seem that the groundwater table in this local area is dipping in an east to west direction, from a level of around 180m AHD in the land to the east of the site (DS2), to about 170m AHD at the eastern boundary of Lot 29, and outcrops at around 156m AHD in the gully in the SW corner of Lot 196.

Approximate potentiometric contours are shown for 180m AHD, 170m AHD and 160m AHD, (based solely on the spring and the fact that no groundwater has been intersected in any excavation in the area. Excavations in the area have gone down to 162m AHD in Lot 29, and 163m AHD in the SE corner of Lot 196.)

The contours must be considered indicative and particularly where the contours are dashed the location must be treated with caution. There is reported to be a spring that flowed in the existing tailings pond, the original depth of which is unknown. The current bottom level is approximately 170m AHD, well above the likely level of groundwater at 160m AHD plus. It is therefore expected that the excavation (by the previous operator) could have intersected the aquifer, but the resultant tailings placement (by Dixon Sand) would have now sealed the flow.

There are no other excavations on the site that are below 160m AHD.

The main storage dam has a current bed level of approximately 161m AHD. This dam is part of the original excavation on the site, carried out in the 1980s. The standing water level in DS No 1 is 158m AHD, and it is located immediately alongside this storage.

The approximate potentiometric groundwater surface is overlain on Figure 1.

The following can be concluded:

#### 1. Identify and classify aquifer systems

Data from at least 8 sites on or adjacent to Lots 196/29 has enabled a reasonable understanding of the groundwater level for the shallow aquifer, at this time.

#### 2. Identify all groundwater dependant land uses and environments

There is only one groundwater dependant landuse that can be identified. The site S17, a deep excavation, is being used for irrigation of agricultural crops. In addition, the environment downstream of Lot 196 would also seem to dependant on dry weather discharges from the shallow aquifer.

#### 3. Assess vulnerability of groundwater

The groundwater would not appear to be at risk either in terms of its quality or aquifer behaviour.

#### 4. Identify freeboard level

This is not possible until the groundwater level can be defined with greater confidence. Further monitoring under the Maroota Groundwater Study should provide an improved understanding. Details of monitoring of the site's bores will be provided to DLWC which will identify the extent of seasonal fluctuations.

#### 5. Identify potential sources of impacts (including seepage from tailings dams

Potential impacts could include:

- Changed seepage rates
- Changed seepage water qualities
- Accidental spill of contaminant

#### 6. Outline the procedures for monitoring groundwater flow and quality

See Section 5

#### 4.3 Impact of Potential Seepage

See comments above.

#### 5. GROUNDWATER MANAGEMENT

Groundwater levels and pH/conductivity for DS1, DS2 and DS 3 will continue to be monitored, on a frequency to be determined.

The data will be provided on an annual basis to both Council and to the DLWC. An assessment will be provided of both the monitoring data and other locally available data in the annual Water Management Plan.

#### 6. REFERENCES

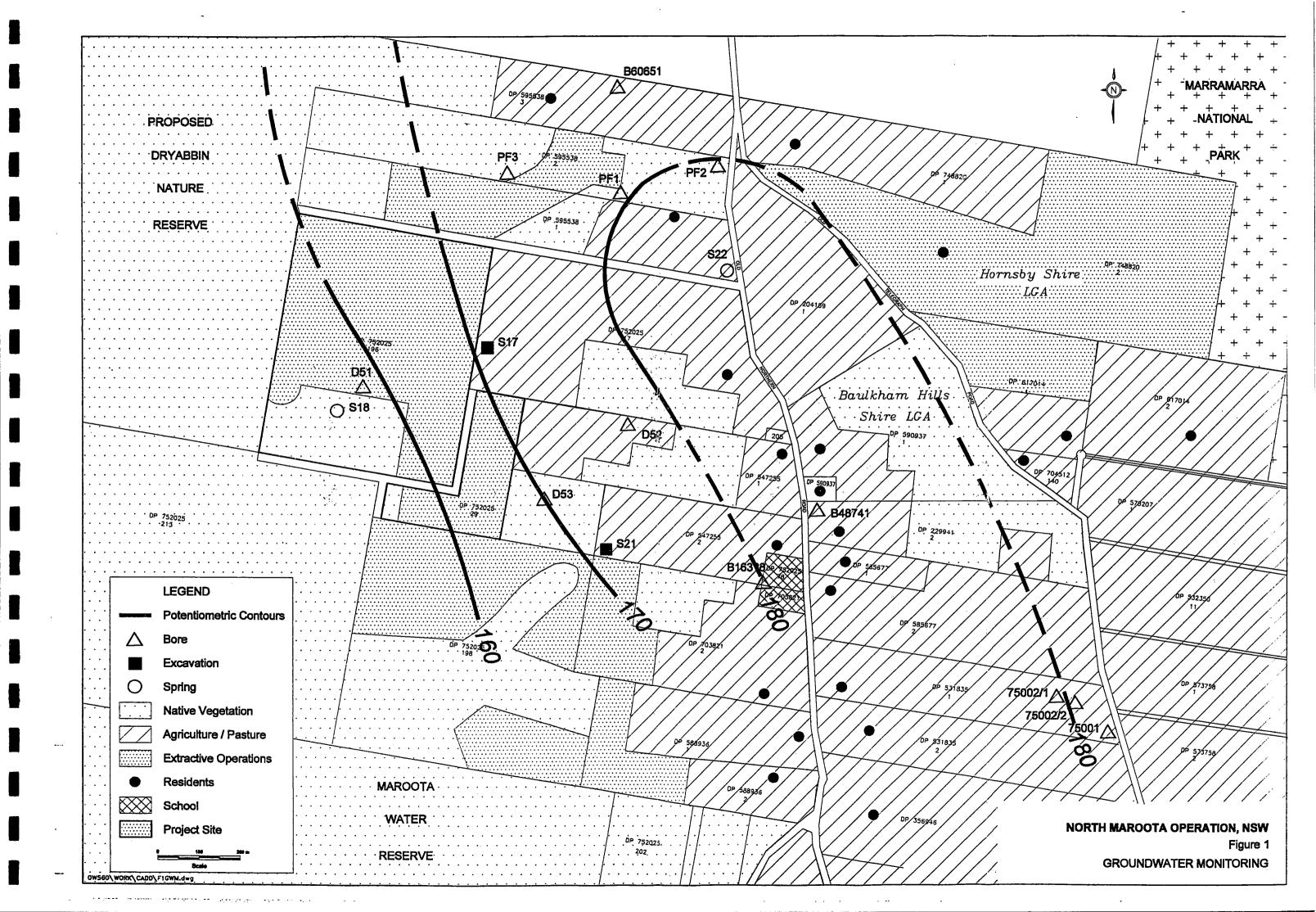
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# APPENDIX C6 – TRAFFIC and TRANSPORTATION ASSESSMENT

#### **Executive Summary**

- 1. Introduction
- 2. Existing Traffic Conditions
- 3. Transport Issues to be Addressed
- 4. The Continuing Quarry and Processing Operations
- 5. Traffic Impacts of Proposed Development

# **DIXON SAND (PENRITH) PTY LTD**

TRAFFIC AND TRANSPORTATION REQUIREMENTS FOR

QUARRYING AND PROCESSING

OPERATIONS PART LOT 196

AND LOT 29

AT

MAROOTA

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**FEBRUARY 1999** 

#### **EXECUTIVE SUMMARY**

The Crown Reserve road provides access to Dixon Sand Pty Ltd from Old Northern Road is located about 1.3 Km north of the intersection with Wisemans Ferry Road.

A twelve hour traffic count was made on 17/12/98 and totalled 120 movements including 67 heavy truck movements. The previous approval allowed 80 heavy truck movements per day.

All trucks from Dixon Sand travel south along Old Northern Road and Wisemans Ferry Road to market. Both roads are State Arterial main roads.

Automatic counters were placed in Old Northern Road south of the Crown Reserve Road (Station 2) and south of Wisemans Ferry Road (Station 335) and in Wisemans Ferry Road west of Old Northern Road (Station 336) to record hourly traffic volumes by direction and vehicle classification on week days and weekend days. The average week day count at Station 2 was 1905 vehicles per day including 151 heavy vehicles. At Stations 335 and 336 the numbers of heavy vehicles were 337 and 289 respectively.

About 85 percent of the 24 hour daily truck movements occurred between 6.00 am and 6.00 pm at the 3 survey locations. The number of truck movements on Saturdays ranged from 50 to 80 percent of the average weekday total at the 3 survey stations.

Old Northern Road and Wisemans Ferry Road have sealed pavements 6.4 metres wide and unsealed gravel shoulders varying in width from 1.5 to 2.5 metres. Based upon Austroads Rural Road Design standards the sealed pavement should be 7 metres wide.

The Crown Reserve Road is partly sealed and in poor condition and is about 600 metres long.

The sign posted speed limit in Old Norther Road increases from 70 to 90 Km/hour about 114 metres south of the Crown Reserve Road.

The Crown Reserve Road / Old Northern Road is operating in Region A (Austroads Figure 5.23a) and provides a satisfactory level of service. The left turn entry radius should be increased to cater for the semi trailers entering the Crown Reserve Road.

The traffic study has addressed the RTA written requirements and transport requirements of Councils DCP No 500, and the Director General's requirements (DUAP).

#### **EXECUTIVE SUMMARY**

(continued)

The processed materials from the quarry will be transported by 3 axile rigid trucks and triaxle semi trailers. The total production days per year allowing for wet weather and public holidays currently total 257. This will increase with Saturday afternoon operations to 283. Based upon 60 loads per day and 24 tonnes payload the site will initially produce 407, 520 tonnes of processed material. It is expected that the average truck payload will increase to 29 tonnes during the life of the project thus increasing the annual production to 492,420 tonnes.

About 50 percent of the trucks carrying processed material will travel south along Old Northern Road and 50 percent will travel on Wisemans Ferry Road. The maximum number of truck movements per hour will be 30.

The weekly increase in heavy trucks is estimated to be 63.6 per cent on the Crown Access Road, 32.4 percent on Old Northern Road at Station 2, 8.8 per cent on Wisemans Ferry Road at Station 336 and 7.5 per cent on Old Northern Road at Station 335.

Assuming an annual growth rate of 2 per cent in Old Norther Road the intersection of the Crown Reserve Road and Old Northern Road will continue to operate at Level of Service A in Region A of Austroads Figure 5.23a.

A conceptual layout showing intersection improvements for the left turn entry including a taper and deceleration lane to the Crown Reserve Road are included in this report. The S.I.S.D. available on each approach complies with the Austroad Standard.

It is recommended that the internal haul road in the Crown Reserve be reconstructed and the pavement sealed for a width of 7 metres. A speed limit of 60 Km/hour is recommeded.

During school hours 8.00 am to 4.00 pm it is estimated that there will be a maximum increase of 2.9 heavy truck movements per hour. No road improvements at the public school are recommended as a result of the increased traffic.

#### **CONTENTS**

#### **EXECUTIVE SUMMARY**

1.0 INTROD	UCTION	
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- 1.1 Background
- 1.2 Scope of Report

#### 2.0 EXISTING TRAFFIC CONDITIONS

- 2.1 Existing Traffic Volumes
- 2.2 Pattern of Truck Movements on Transport Routes in Maroota
- 2.3 Road Inventory
- 2.4 Operation of Crown Road/Old Northern Road Intersection.
- 2.5 Vehicle Access to Site

#### 3.0 TRANSPORT ISSUES TO BE ADDRESSED

- 3.1 RTA Requirements
- 3.2 Baulkham Hills Council DCP No 500
- 3.3 Director General's Requirements, Department of Urban Affairs and Planning

#### 4.0 THE CONTINUING QUARRY AND PROCESSING OPERATIONS

- 4.1 Quarry and Processing Operations
- 4.2 Production Rate of Processed Sand
- 4.3 Estimated Daily Truck Movements
- 4.4 Distribution of Trucks to Main Road System
- 4.5 Projected increase in Hourly and Daily
  Truck Movements on Main Road Network
- 4.6 Need for Intersection Improvements

#### 5.0 TRAFFIC IMPACTS OF PROPOSED DEVELOPMENT

- 5.1 Crown Reserve Road
- 5.2 Operation of Crown Reserve Road/Old Northern Road Intersection
- 5.3 Increased Truck Traffic on Main Road System

# **LIST OF FIGURES**

Figure 1	Regional	Regional Location Map		
Figure 2	Locality F Lot 29	Locality Plan Part Lot 196 and Lot 29		
Figure 3	Peak Hou	ır Traffic Volumes.		
Figure 4	Traffic C	ounting Stations		
Figure 5	Layout O	ld Northern Road and Dixon Sand Access Road.		
Figure 6	Detail and and Lot 2	d Contour Plan Lot 196 29		
Figure 7	Schemati	ic Extraction and Transport Plan		
Figure 8	Future Pe	eak Hour Volumes		
Figure 9	-	Conceptual Layout of Intersection Improvements Access Road/Old Northern Road		
<b>APPENDICES</b>				
Appendix A		raffic Volume and Classification Count for 6.00 am to 6.00 pm at ld Northern Road/Access Road Intersection		
Appendix B		lassification and Volume Counts by Direction at 3 Counting Stations or 7 days on Haul Road Network.		
Appendix C	Table C 1.	Existing Average Hourly Heavy Truck Volumes Monday to Friday on Wisemans Ferry Road and Old Northern Road.		
	Table C 2.	Increase in Heavy Trucks Generated by Continuing Operations Hourly Distribution to Old Northern Road and Wisemans Ferry Road Monday to Friday		
	Table C 3.			
	Table C 4	Existing Hourly Heavy Truck Volumes on Old Northern Road and Wisemans Ferry Road.		
	Table C 5	Heavy Trucks Generated by Continuing Operations and Hourly Distribution to Old Northern Road and Wisemans Ferry Road, Saturdays.		
Appendix D	Vehicle Classif	fication Chart		
Appendix E		Transport from DCP No 500 and State Environment y No 11 (S.E.P.P 11)		

#### 1.0 INTRODUCTION

#### 1.1 Background

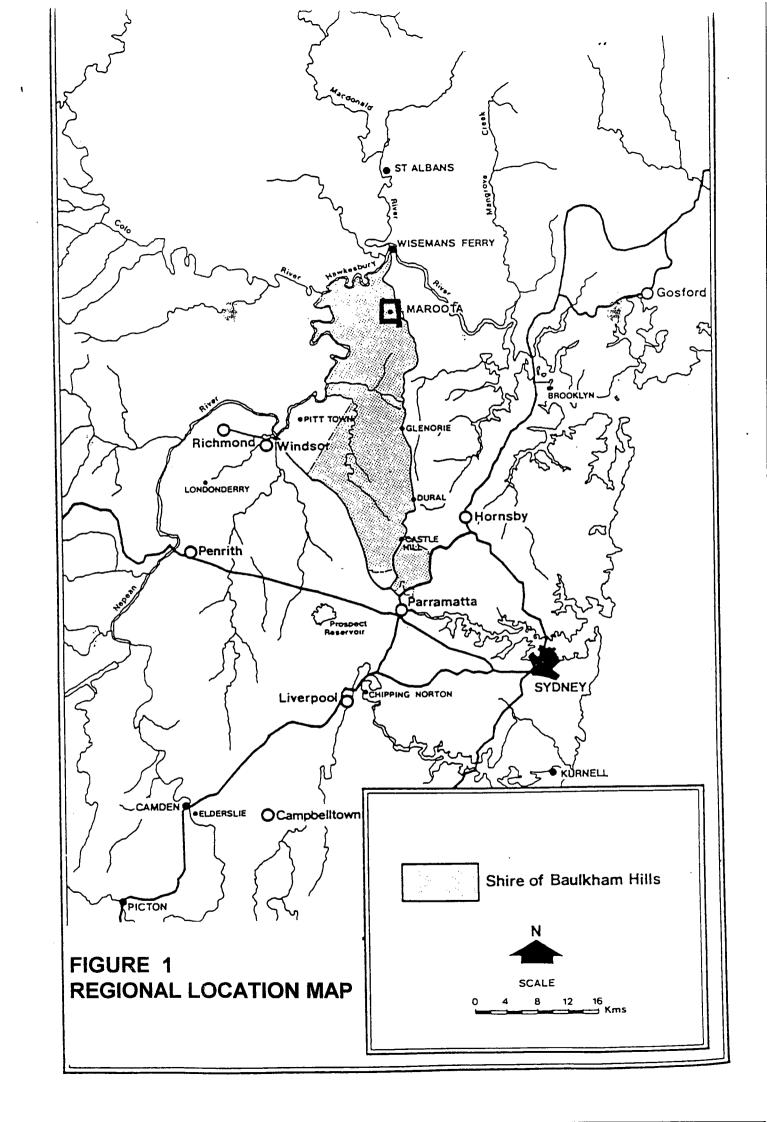
This report on traffic and transportation aspects of the proposed quarry and processing operations on Part Lots 196 and 29 at Maroota, has been prepared for the EIS being undertaken by Lyall and Macoun Consulting Engineers. Maroota is located some 40 km north of Parramatta as shown in Figure 1, Regional Location Map.

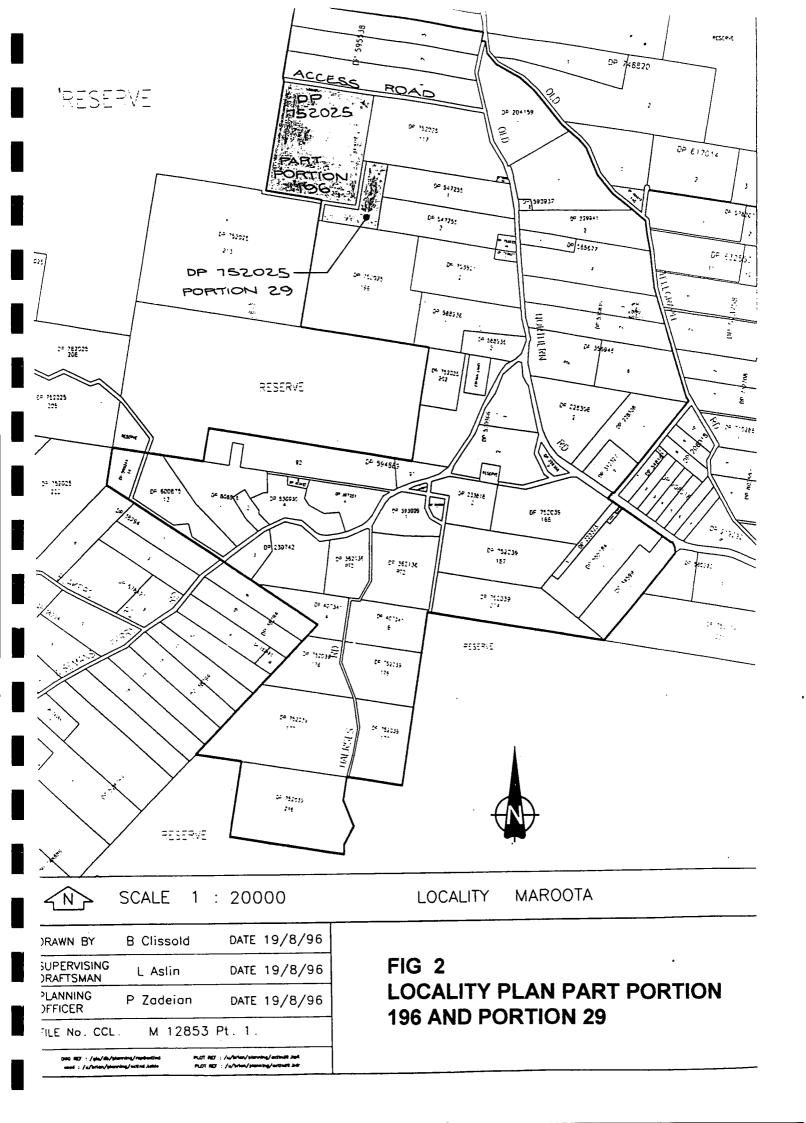
The site of the quarry and processing operations is shown in Figure 2 Locality Plan Part Lots 196 and 29

#### 1.2 Scope of Report

This report addresses the transport issues described in Section 3 of this report and describes our investigation and findings in respect of the following matters:-

- Existing traffic volumes on the proposed haul routes.
- Estimated hourly and daily truck movements generated by the continuing operations.
- Distribution of trucks to the State Arterial Road System.
- Proposed Access to and from the site.
- Access to Old Northern Road and need for improvements.
- Standard of internal access road and need for improvements.
- Impacts of increased truck traffic on the State Roads and nearby residential areas.
- Safety issues and measures to improve safety.





#### 2.0 EXISTING TRAFFIC CONDITIONS

#### 2.1 Existing Traffic Volumes

#### 1) Old Northern Road/Crown Road Intersection.

Twelve hour traffic volume and classification counts were made at the intersection of Old Northern Road and the Crown Road to determine the highest hourly volumes and turning movements at the intersection in order to confirm the extent and type of improvements necessary to meet RTA and Austroad Standards.

Although traffic volumes were low (120) in the Crown Road over fifty percent (67) of heavy trucks were recorded in the twelve hour count. It is relevant to note that the number of heavy trucks was lower than the 80 trucks allowed in the previous approval for Dixon Sands. It is estimated that the average weekday 24 hour volumes would be 125 to 130 vpd.

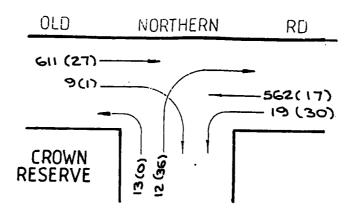
The am and pm peak hours were from 8.00 - 9.00 am and 4.30 - 5.30 pm. The two way through traffic volumes in Old Northern Road ranged from 70 vphr to 132 vphr between 6.00 am and 6.00 pm. The twelve hour count showing cars and light vehicles and heavy trucks and the two peak hour counts are shown in **Figure 3.** 

#### 2) Weekday and Weekend Volumes on State Arterial Roads

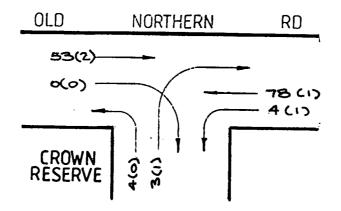
Automatic counters were placed at three locations (See Figure 4) on the haul road network from the subject site to determine the time pattern and volumes of light vehicle and heavy truck movements over a full 7 days including a weekend. Light vehicles are cars, and 2 axle trucks, vans etc and heavy vehicles are three or more axle trucks such as the fleet used for the transport of sand from extractive operations in the area. The counter at Station 334 was vandalized but a recent count in October 1997 has been substituted. A classification chart is included in **Appendix D**.

The average weekday and weekend two way daily traffic volumes at Stations 2, 335 and 336 were as follows:-

Average	Old Northern Road	Old Northern Road	Wiseman Ferry Road
Daily-	MR 181	MR 160	MR 181
Volumes	Station 2	Station 335	Station 336
Average Weekday			
Total Vehicles	1905	1832	1522
Light Vehicles	1754	1495	1233
Heavy Vehicles	151	337	289
Average Weekend			
Total Vehicles	2767	2500	1881
Light Vehicles	2670	2358	1764
Heavy Vehicles	97	142	117



12 HOUR INTERSECTION TRAFFIC VOLUME COUNT 6:00am - 6:00pm 17-12-98

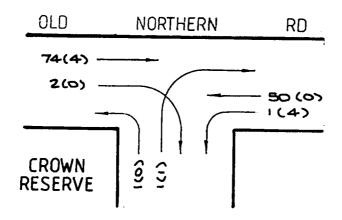


LEGEND

53-CARS & LIGHT . VEHICLES

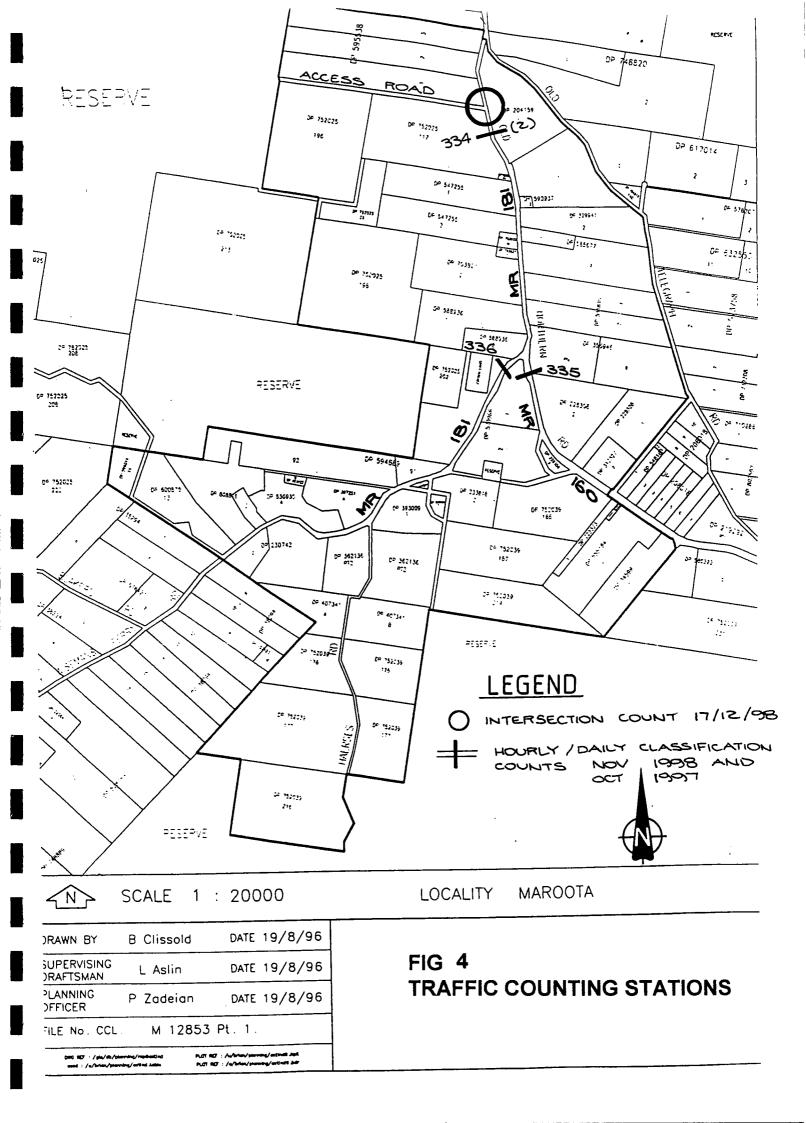
(4) - 3 AXLE TRUCKS & LARGER

AFTERNOON PEAK HOUR TRAFFIC VOLUMES 4:30 - 5:30pm 17 -12 - 98



MORNING PEAK HOUR TRAFFIC VOLUMES 8:00 - 9:00 am 17-12-98

FIG 3
PEAK HOUR TRAFFIC VOLUMES



### 2.2 Pattern of Truck Movements on Transport Routes in Maroota

The complete counts of light and heavy vehicles for each hour of the day by direction at survey stations 2, 335 and 336 are included in **Appendix B**.

The average number of heavy truck movements Monday to Friday by hour of day from 6.00 am to 6.00 pm and for the 24 hour period at each survey location are contained in **Table C1** in **Appendix C**.

Similar data for Saturdays is contained in **Table C4** in **Appendix C**. The main findings were:-

### Station 2- Old Northern Road

The number of trucks northbound, was more than twice the southbound total of 44.6 over the 24 hour period Monday to Friday. Hourly volumes northbound ranged from 3.8 to 11.6 between 6.00 am and 6.00 pm, South bound the hourly volumes were 1.2 to 4.0.

### Station 336- Wisemans Ferry Road

Truck volumes southbound were marginally higher than northbound. Hourly movements southbound ranged from 3.6 to 10.2 between 6.00 am and 6.00 pm. Total heavy truck movements over 24 hours averaged 142 northbound and 147 southbound.

#### Station 335- Old Northern Road

Heavy truck volumes northbound and southbound were roughly equal between 6.00 am and 6.00 pm and were significantly higher than station 336 over the 24 hour period. The average 24 hour volumes Monday to Friday northbound and southbound were 171.8 and 165.2 respectively. Hourly volumes northbound ranged from 6.0 to 17.4 between 6.00am and 6.00pm.

The counts show that about 85 percent of the 24 hour daily truck movements in both directions occur between 6.00 am and 6.00 pm at all survey locations. The pattern of truck movements was abnormal at Station 2 because the northbound total was about twice the southbound total. At Stations 336 and 335, the 24 hour daily total of heavy trucks Monday to Friday in each direction exceeded 142 and 165 respectively. The total number of truck movements on Saturdays ranged from about 50 percent to about 80 percent of the daily Monday to Friday total. However, the number of light vehicles was significantly greater on Saturdays and Sundays (Appendix B).

### 2.3 Road Inventory

Old Northern Road has a sealed pavement about 6.4 metres wide and unsealed gravel shoulders which vary in width from about 1.5 to 2.5 metres. Wisemans Ferry Road is of a similar standard to Old Northern Road. The edges of the sealed pavement are subject to higher loading by heavy vehicles travelling near the edges of the road pavement and require higher maintenance to repair the broken edges. The road pavement is generally in reasonable condition.

Based upon Table 4.1 in Austroads Rural Road Design the sealed pavement in Old Northern Road and Wisemans Ferry Road should be 7.0 metres wide because the AADT traffic volumes are well in excess of 1000 veh/day.

About 114 metres south of the road to Dixon Sands in the Crown Reserve, the sign posted speed limit increases from 70 km/hour to 90 km/hour. There is a horizontal curve south and north of the Crown Reserve which restrict the sight distance to about 200 metres and 220 metres respectively (refer **Photos 4 and 5**). There is a curve warning sign W1 -3R about 143 metres north of the Crown Reserve. The design speed of this section of Old Northern Road is only marginally below the 100 km/hour design standard considered appropriate for an arterial road in this terrain..

The vertical road alignment from the south falls to a culvert and low point about 30 metres north of the Crown Road and rises again to the north. The road layout is illustrated in **Figure 5**.

The access road in the Crown Reserve is about 600 metres long and is sealed for a distance of 400 metres from Old Northern Road. The road pavement is a maximum width of 6.5 metres and is in poor condition. The last 200 metres of the road is an unsealed sand clay pavement in reasonable condition (Refer Photos 6 and 7)

### 2.4 Operation of Crown Road/Old Northern Road Intersection.

Based upon gap acceptance criteria the average delays to right and left turning vehicles are negligible under existing am and pm peak hour traffic conditions.

Based upon existing peak hour volumes the total approaching volumes for the right turn entry and left turn entry are less than 100 pcu's (passenger car units) and therefore with reference to **Figure 5.23a** Warrants for Rural Turn Lanes, the intersection is operating in Region A for both movements. Because of the semi trailers entering the access road via a left turn a larger radius is probably required as illustrated in **Figure 5.16 AUSTROADS Part 5** Intersections at Grade to facilitate the turning manoeuvre.

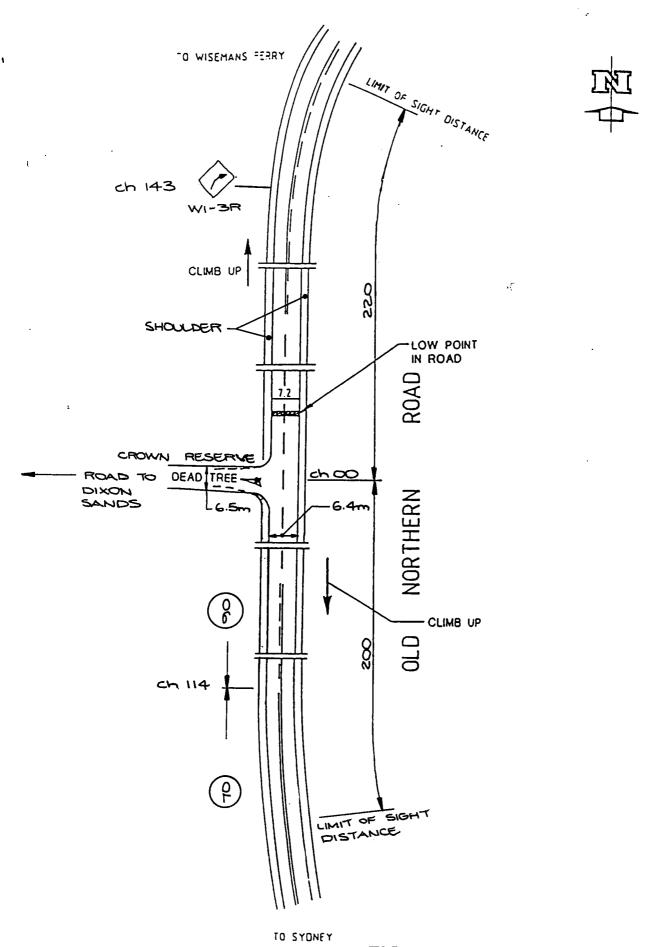


FIG 5
LAYOUT OLD NORTHERN ROAD
AND DIXON SANDS ACCESS
ROAD

### 2.5 Vehicle Access to Site

The entry gate to Lot 196 is located some 600 metres west of Old Northern Road and close to an uncontrolled four way intersection where a private road crosses the Crown Reserve. Sight distance is restricted and signposting with Give Way or Stop signs is required together with an advance warning sign Intersection W2-1A and Heavy Machinery Crossing T1-206 because of the off road vehicles using the private road.

### 3.0 TRANSPORT ISSUES TO BE ADDRESSED

### 3.1 RTA Requirements

The following requirements were contained in a letter dated 14/5/98 from the Land Use/Transport Manager RTA to Lyall and Macoun Consulting Engineers:-

"The Roads and Traffic Authority would like to see the EIS address the following matters:

- The proposed means of access to/from the site;
- 2. Likely daily traffic movements generated by the development;
- 3. An assessment of the likely impact of truck traffic upon nearby residential areas;
- 4. Details of the anticipated route of trucks through the metropolitan road network;"

### 3.2 Baulkham Hills Shire Council DCP No 500

In a letter dated 7/5/98 to Lyall and Macoun Consulting Engineers, the Manager Development Control, Baulkham Hills Shire Council advised that the application is expected to address all requirements of Councils' DCP No 500 Extractive Industries.

A copy of Section 2-3 Transport which specifies Element Objectives, Performance Criteria and Prescriptive Measures is included in **Appendix E** to this report. Reference under Prescriptive Measures is made to State Environmental Policy No 11 - Traffic Generating Developments and this document is also included in **Appendix E**.

### 3.3 Director General Requirements, Department of Urban Affairs and Planning

These requirements were included in a letter dated 20/5/98 from the Acting Manager Major Assessments and Hazards Branch to Lyall and Macoun Consulting Engineers.

The Key Issues referred to S.E.P.P No 11 Traffic Generating Developments, Baulkham Hills DCP No 500 - Extractive Industry and the Departments EIS Guideline "Extractive Industry Quarries". The relevant part of the latter document which deals with traffic and road Issues is reproduced as follows:-

### 3.3 Continued

### 1. Traffic and road issues.

A traffic impact study should be undertaken for all operations involving significant numbers of truck movements including:

- a) the estimated average and maximum hourly, daily and weekly truck movements: proposed truck types and sizes; if trucks will arrive or leave in convoy or queue to enter the site or need to wait outside the quarry gate.
- b) proposed truck routes and possible alternative routes or transport modes, e.g. conveyer belts, rail
- c) the physical condition of the roads or bridges on the proposed routes and upgrading proposals
- d) the measures to prevent sediment transport off-site via transport vehicles including shakedown areas or properly controlled truck wash facilities
- e) the potential impact on the road maintenance program
- f) road safety issues; include:
  - other major road users, peak periods of use and potential conflicts; use of the truck routes by school buses and the location of schools and bus stops
  - ii) any sight distance constraints for:
  - turning traffic into or from the quarry access road
  - any relevant uncontrolled intersections, road junctions or railway crossings
  - iii) proposed measures to improve safety including:
  - any possible realignment of roads
  - any need to improve sight distance or intersections or crossings
  - any need to restrict hours of truck movement, the number of trucks per day or the load size on certain routes.

### 4.0 THE CONTINUING QUARRY AND PROCESSING OPERATIONS

### 4.1 Quarry and Processing Operations

These matters are described in detail in **Chapter 4** of the **EIS**. A reduced copy of the Detail and Site Contours for Lots 196 and 29 prepared by Keown & Drummond Pty Limited, surveyors is included as **Figure 6**. Basically the overburden is removed and stockpiled for reuse and the sandstone resource is ripped, loaded by scraper, loaded into dump hoppers from whence it is moved by conveyor to the crushers where it is crushed, screened, washed (as necessary) and stockpiled to produce concrete and mortar sands for the construction industry.

The processed materials are loaded into rigid 3 axle trucks or triaxle semi trailers for transport to market.

### 4.2 Production Rate of Processed Sand

This aspect is again discussed in detail in **Chapter 4** of the **EIS**. Allowing for wet weather and public holidays the total production days per year total 257. Based upon weighbridge records the average tonnage per truck under the previous consent was 24 tonnes. This is equivalent on the basis of 60 loads per day to some 370,080 tonnes per annum in 15420 truck loads. It is expected in the future that average truck loads will increase to 29 tonnes. Based upon 60 truck loads per day for 283 days the total number of truck loads per year would be 16980 and the quantity carried could increase to 492,420 tonnes.

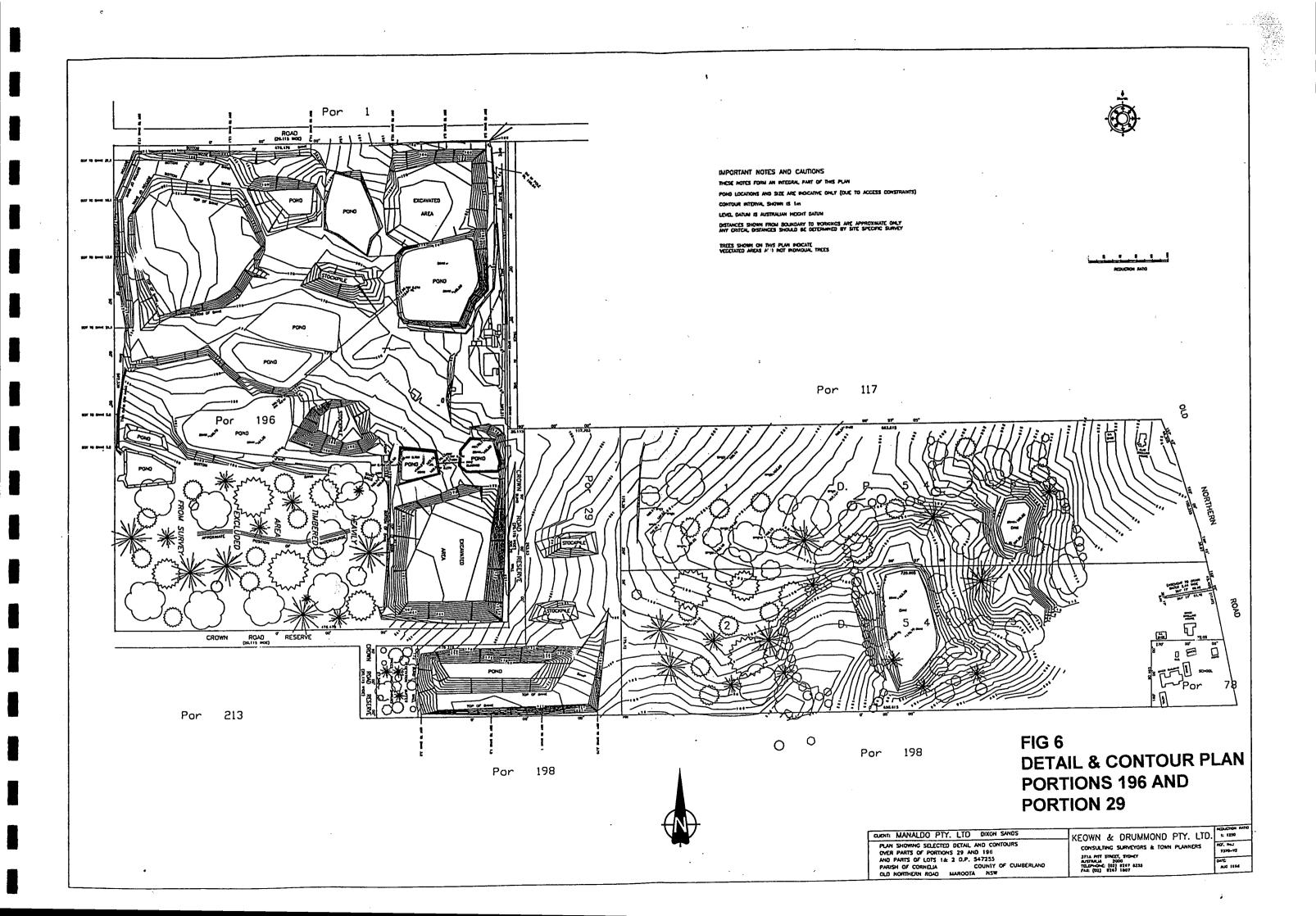
### 4.3 Estimated Daily Truck Movements

Processed material will be transported to market in rigid 3 axle trucks and triaxle-axle semi trailers. Based upon previous records, it is expected that the average laden truck leaving the site will initially carry 24 tonnes payload of processed material.

The proposed daily operating hours at the site will be 6.00 am to 6.00 pm, Monday to Saturday. The site, subject to weather conditions, will operate 283 days per year and initially produce 407,520 tonnes of processed material per annum. Although a maximum 60 laden truck movements per day is applied for, the average number of laden truck movements daily from the site may be less.

### 4.4 Distribution of Trucks to Main Road System

We have been advised that 50 per cent of trucks carrying processed material from the site will travel south along Old Northern Road. These trucks will



### 4.4 (Cont...)

pass through survey Counting Stations 2 and 335 in Old Northern Road.

The remaining 50 percent of trucks will travel south on Wisemans Ferry Road and pass through Counting Station 336.

The number of laden and unladen trucks travelling in Wisemans Ferry Road and Old Northern Road has been estimated for each hour of the day Monday to Saturday between 6.00 am to 6.00 pm based upon the 50/50 split and limitations on hourly volumes imposed following the Acoustic Study carried out by Dick Benbow and Associates Pty Limited. The maximum hourly truck movements from and to the site are as follows:-

TIME PERIOD		MAXIMUM NUMBER OF LADEN AND UNLADEN TRUCKS PER HOUR.
6.00 am - 7.00 am	_	30
7.00 am - 9.00 am	_	
9.00 am - 6.00 pm	_	8
5.55 d 5.55 p		

Total Daily 120

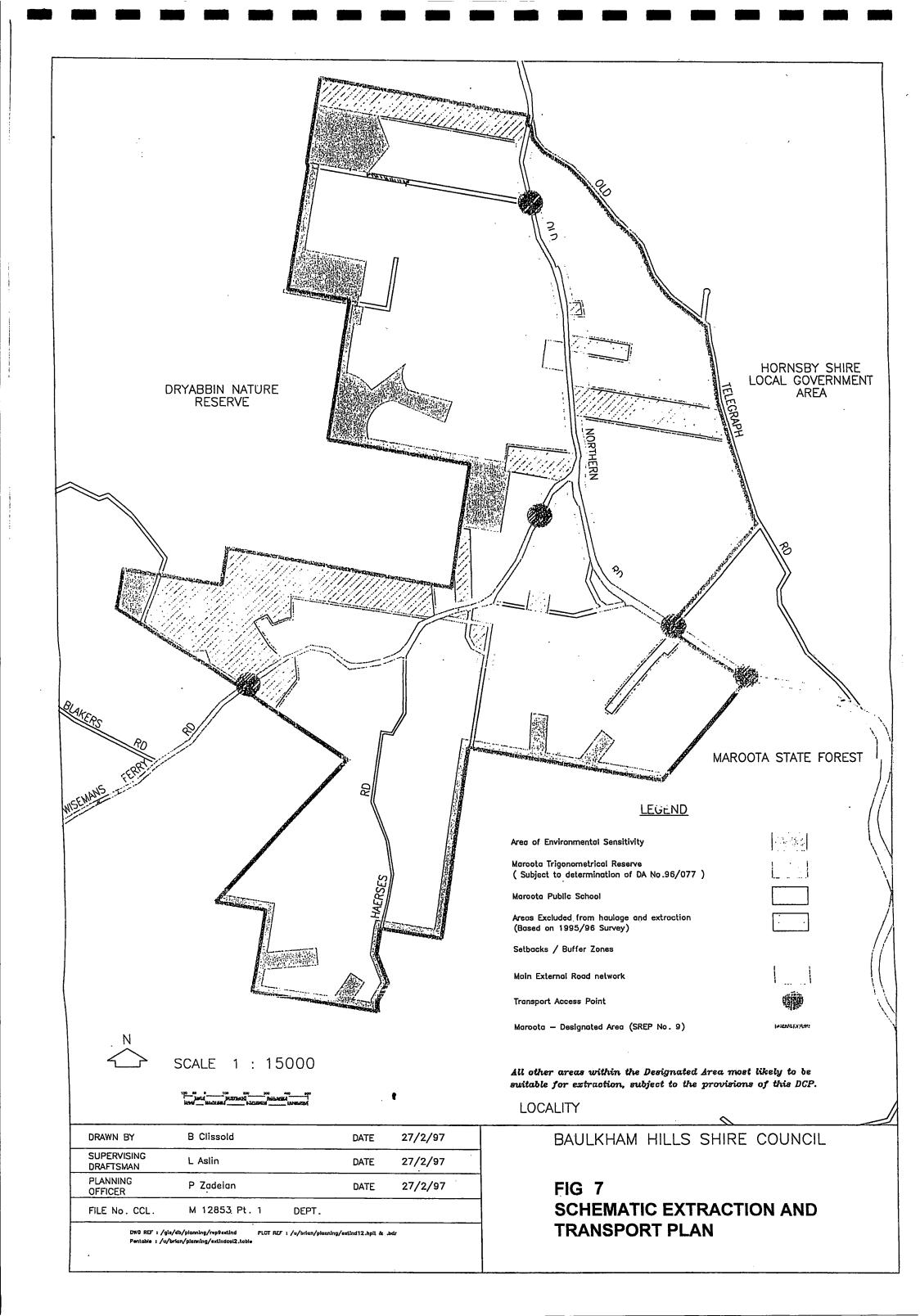
The increased volumes of development generated trucks are shown in **Table C2** (Monday to Friday) and **Table C5** (Saturday). Existing and increased development truck volumes are shown in **Table C3** (Monday to Friday) and **Table C6** (Saturday).

The access road from the site to Old Northern Road is in a Crown Reserve. This road and the access point to Old Northern Road is shown in the Schematic Extraction and Transport Plan contained in the Baulkham Hills DCP No 500 and included as **Figure 7** in this report.

### 4.5 Projected Increase in Hourly and Daily Truck Movements on Main Road Network

As shown in **Table C3** the maximum hourly generation rates inbound and outbound through Station 2 on an average weekday will be between 8.00 am and 5.00 pm Monday to Friday. The truck movements are expected to be lower in the peak direction of flow during the normal 7.00 am to 8.00 am peak hour and in both directions in the 5.00 pm to 6.00 pm commuter peak hour.

During busy times the site could generate up to a maximum of 60 laden and 60 unladen truck movements per day, the corresponding hourly rate would be 7 laden out and 14 unladen returning between 1.00 and 2.00 pm on weekdays.



### 4.5 Projected Increase in Hourly and Daily Truck Movements on Main Road Network (Cont...)

The generation rates for Saturdays will be similar to weekdays. There will be no truck traffic generated on Sundays.

The existing trucks, estimated increased development trucks and total trucks by direction by hour of the day, are shown in Tables C1, C2 and C3 for weekdays and in Tables C4, C5 and C6 for Saturdays.

The number of existing daily truck movements Monday to Friday (averaged) and Saturdays, increase generated by the proposed Development and total heavy truck movements are shown in Table 4.5.

Since pavement design thicknesses are based upon the expected number of equivalent standard axle loadings it is relevant to consider the increase in heavy truck movements.

The figures have been totalled to show the increase for a full week (7 days) at each counting station location and the percentage increase compared with existing heavy truck volumes at each location.

Table 4.5 Increased Heavy Truck Traffic Generated by Development on Average Weekdays and Saturdays

PERIOD	STATION 2							
Monday to Friday	Exist	Increase	Total					
(5 days)	754	200	954					
Saturday	111	80	191					

PERIOD		STATION 3	36	STATION 335				
Monday to				Exist	Increase	Total		
Friday (5 days	1443	100	1543	1685	100	1785		
Saturday	149	40	189	181	40	221		

Summary	Weekly Increase In Heavy Trucks				
Route	Number	Per Cent			
Access Road	280	63 6 percent			
2 Old Northern Road from Access Road to Wisemans Ferry Road	280	32.4			
336 Wisemans Ferry Road south of Old Northern Road	140	8.8			
335 Old Northern Road south of Wisemans Ferry Road	140	7.5			

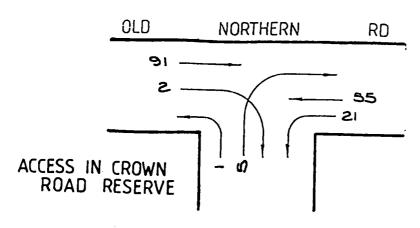
### 4.6 Need for Intersection Improvements

This development application will be for a period of five years although it is likely resource extraction and traffic generation will be completed within five years. Based upon an annual growth rate of 2 percent in Old Northern Road through traffic volumes could increase by 10.4 per cent over five years. The hourly distribution of trucks to and from the site assuming a similar pattern to the existing site and hourly limits as stated in Section 4.4 are listed in Table C2 for Mondays to Fridays and Table C5 for Saturdays.

The estimated future peak hour volumes in 2004 expressed in (passenger car units) pcu's at the intersection of the access road to Dixon Sand and Old Northern Road are shown in **Figure 8**.

Using Gap Acceptance Analysis the intersection will continue to operate under Level of Service A in Region A of Austroads Figure 5.23a

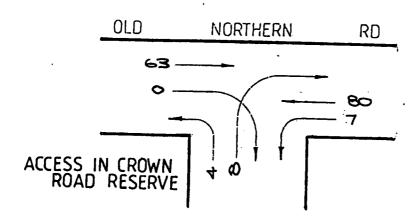
As discussed in Section 2.4 minor improvements to the left turn entry from Old Northern Road to facilitate the turning manoeuvre for semi-trailers and a deceleration lane are required. The improvements are illustrated in concept form in **Figure 9**. Conceptual Layout of Intersection Improvements Access Road/Old Northern Road Intersection and are based upon Austroads **Figure 5.16** 



MORNING PEAK HOUR TRAFFIC VOLUMES 8:00 - 9:00 am 2004

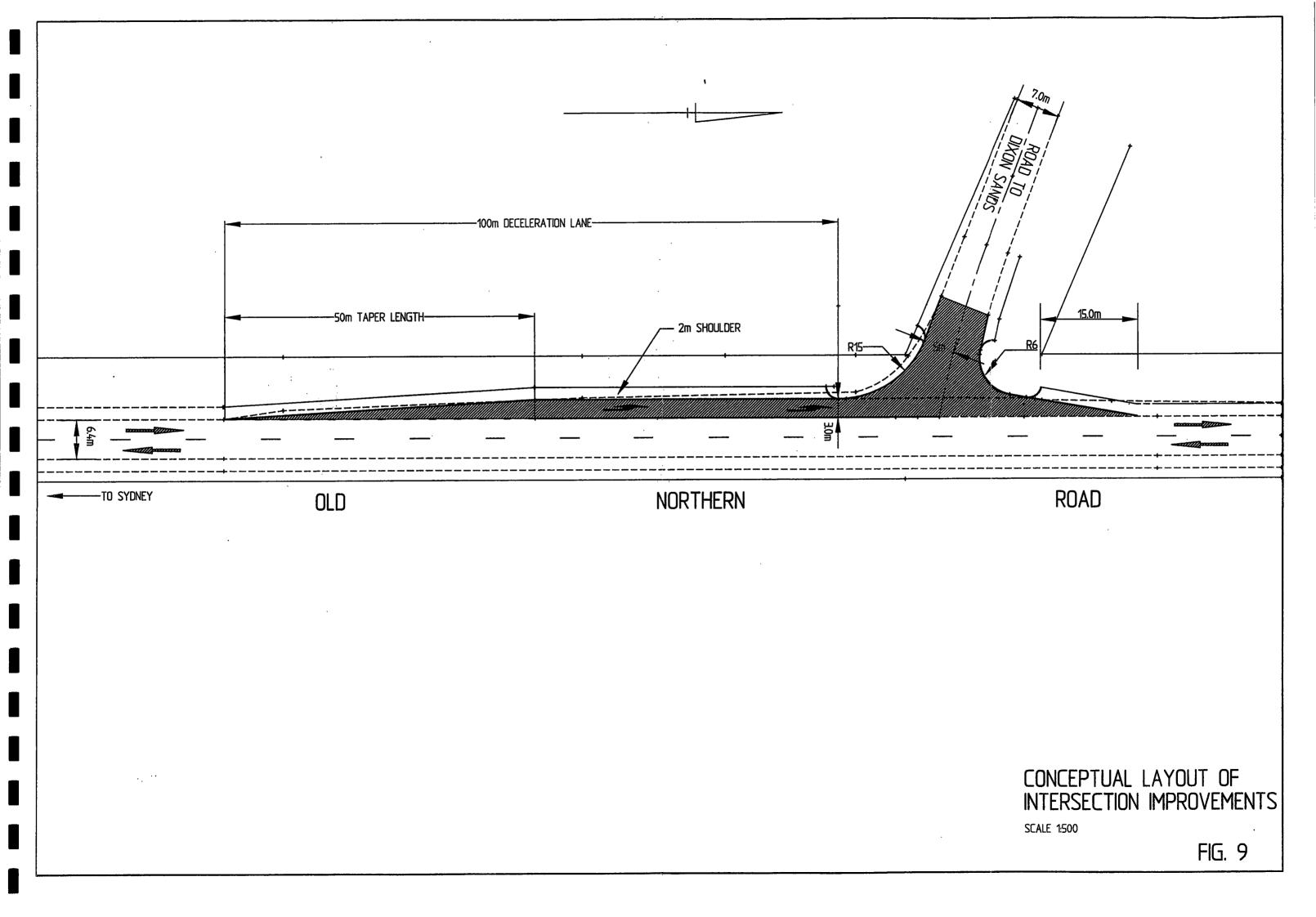
# LEGEND PASSENGER CAR UNITS PCU'S





AFTERNOON PEAK HOUR TRAFFIC VOLUMES 4:30 - 5:30 pm 2004

FIG 8
FUTURE PEAK HOUR TRAFFIC
VOLUMES



### 5.0 TRAFFIC IMPACTS OF PROPOSED DEVELOPMENT

#### 5.1 Crown Reserve Road

The existing twelve hour count shown in **Figure 3** was 120 vehicles including 67 trucks. In the future the number of trucks will be 120, an increase of 53. Therefore the maximum twelve hour volume is estimated to be 173 vehicles of which 120 will be heavy trucks. The existing access road is in poor condition and needs to be upgraded. Off road type vehicles such as scrapers do not use this road and therefore the road pavement should be designed for heavy trucks. Although the future traffic volumes will be less than 200 vehicles per day the percentage of heavy trucks will be around 60 per cent and therefore a pavement width of 7 metres should be provided based upon Austroads **Table 4.1** Traffic Lane Widths for Undivided Sealed Roads.

It is recommended that the road pavement be sealed with a hot flush bitumen seal to eliminate dust. A suitable typical cross section for the internal haul road is shown in **Figure 10**. It is recommended that the road be signposted for 60 km/hour operation for safety and environmental reasons.

There is no alternative route for the access road which is located within a Crown Reserve.

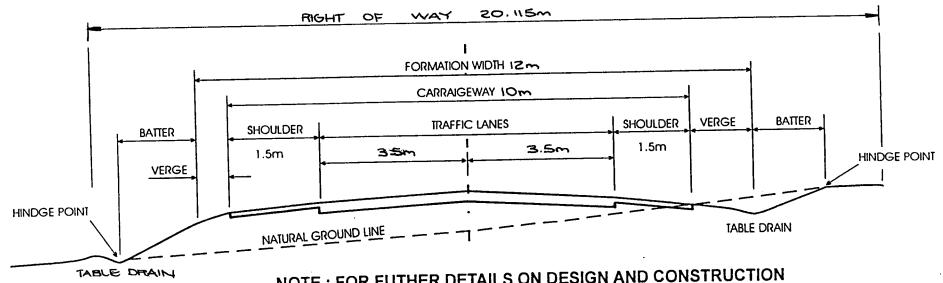
### 5.2 Operation of Crown Reserve Road/Old Northern Road Intersection

#### i) Sight Distance

The minimum requirement to provide the driver of a vehicle adequate distance to observe the roadway layout, including pavement markings etc. in sufficient time to react and stop if necessary before entering the conflict area is the Approach Sight Distance (ASD).

Safe Intersection Sight Distance (SISD) is the minimum standard which should be provided on the major road at any intersection. It provides sufficient distance for a driver of a vehicle on the major road to observe a vehicle from a minor road approach moving into a collision situation and to decelerate to a stop before reaching the collision point.

For vehicles travelling south in Old Northern Road and approaching the access road to Dixon Sand, the design speed is 90 km/hr. For vehicles travelling north in Old Northern Road and approaching the access road the design speed changes from 70 km/hr to 90 km/hr 114 metres south of the access road. The required ASD and SISD sight distances for 70 km/hr and 90 km/hr are as follows from Austroads Tables 5.1, 5.2 and 5.3 from Part 5, Intersections at Grade:-



NOTE: FOR FUTHER DETAILS ON DESIGN AND CONSTRUCTION PLEASE REFER TO ATTACHMENT 1.

FIG 10
TYPICAL CROSS SECTION OF
INTERNAL ACCESS ROAD

### 5.2 Operation of Crown Reserve Road/Old Northern Road Intersectioni) Sight Distance (cont...)

#### ASD Design SISD 4% Speed Metres Metres Downgrade Km/hr Correction 70 85 140 + 5 m. 90 130 210 + 10 m

The S.I.S.D. available on each approach in Old Northern Road complies with the required Austroad standard.

### 2) Warrants for Rural Turn Lanes

The existing and future peak hour traffic volumes at the intersection of the access road and Old Northern Road are such that turning volumes are in the low part of **Region A** in **Figure 5.23a** and hence a **Type A** right turn and **Type B** left turn treatment is required. The length of deceleration lane required for the left turn entry is 100 metres including a 50 metre long taper.

### 5.3 Increased Truck Traffic in Main Road System

The increase in heavy truck traffic in Old Northern Road, north of Wisemans Ferry Road is estimated to be a maximum of 280 movements per week i.e., 40 movements per day Monday to Friday and 80 movements per day on Saturday and represents a 32.4 per cent increase.

Safety improvements have been made at the school so that buses can pick up and set down in a bus lane separated from the main road. Buses travelling south are required to turn right across the north bound traffic lane to reach the set down area. If continuing south after the drop off or pick up the buses have to cross the northbound traffic lane and merge with traffic in the southbound lane. It is understood that the current arrangement whilst not ideal has a good safety record.

Additional trucks travelling south and north will be limited to a maximum of 15 per hour in the current application whereas there was no upper limit in the previous consent. The traffic count made on 17 December 1998 showed that this was a light day with only 67 heavy truck movements from the site compared with approval for eighty movements per day.

### 5.3 (Cont...)

A 26.5 percent increase in truck movements on Monday to Friday equates to an average of 2.9 additional trips per hour on the main road past the school during school hours 8 am to 4 pm.

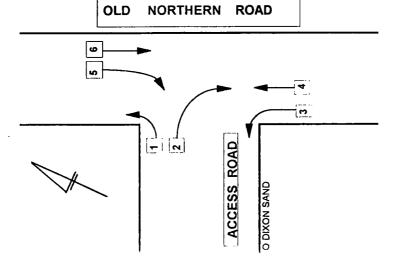
With reference to **Figure 5.23a** in Austroads Part 5 Intersections at Grade, the bus turning manoeuvres are at the low end of Region A and will remain so with the expected increase in truck traffic. During the times of bus operation the 40 km/hr speed limit applies. No road improvements at the school are recommended as a result of the increased traffic.

Irrespective of whether the proposed quarry operation continues or not there is a need to widen the road pavement in Old Northern Road to 7 metres based upon existing traffic volumes and the proportion of heavy trucks to comply with Austroads Standards.

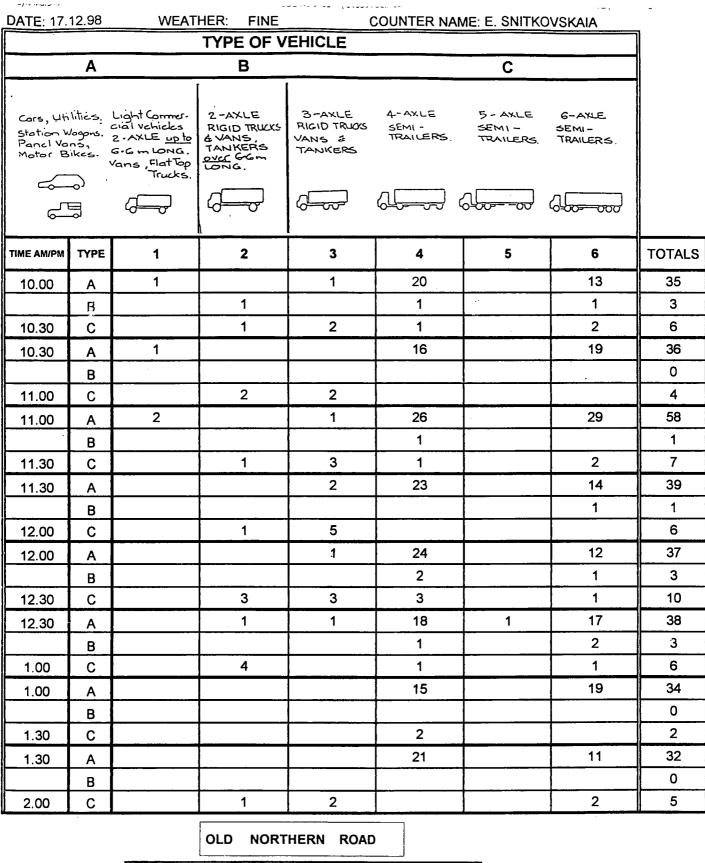


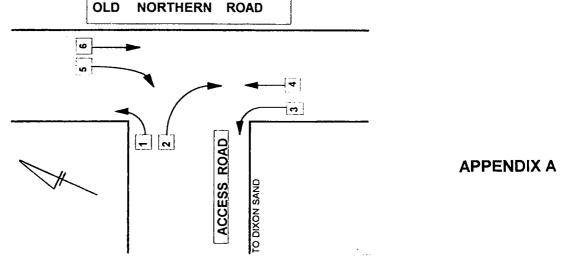


DATE: 17.	12. 98	WE	ATHER: fine		COUNTER NA	ME: E. SNITK	OVSKAIA	-
			TYPE OF V	EHICLE				
	Α		В			С		
Cors, Ut Station I Panci Ve Motor E	<b>⇒</b> :	Light Commercial Vehicles 2-AXLE up to 6-6 m LONG. Vans, Flat Top Trucks.	2-AXLE RIGID TRILKS 4 VANS, TANKERS OVER GGM LONG.	3-AXLE RIGID TRUXS VANS & TANKERS	SEMI - TRAILERS	SEMI - TRAILERS.	6-AYLE SEMI- TRAILERS	
TIME AM	TYPE	1	2	3	. 4	5	6	TOTALS
6.00	Α	1	· · · · · · · · · · · · · · · · · · ·	2	7	1	20	31
	В					1	1	2
6.30	С	·	8	2				10
6.30	Α			2	16	2	31	51
	В				3			3
7.00	С		1	1	2.			4
7.00	Α		2	2	21		40	65
	В	,	-					0
7.30	C		1	.1	1		1	4
7.30	Α				11	2	35	48
	В				3		1	4
8.00	С		1				1	2
8.00	Α		1	1	29		30	61
	В				1		1	2
8.30	ပ			1			2	3
8.30	Α	1			16	2	42	61
	В				4	- :	1	5
9.00	O		1	3			2	6
9.00	Α			1	12		29	42
	В							0
9.30	С		4	1			1	6
9.30	Α		1		19		26	46
	В				1			1
10.00	C		2		1			3



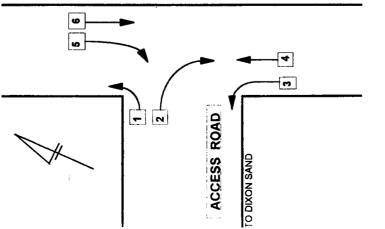
**APPENDIX A** 





WEATHER: FINE COUNTER NAME: E. SNITKOVSKAIA DATE:17.12.98 TYPE OF VEHICLE C Α В Cors, Utilities. Light Commercial vehicles
Station Wagons. 2-AXLE up to
Motor Bikes. 66 m LONG. 3-AXLE 4-AXLE 5-AXLE 2-AXLE 6-AXLE RIGID TRUOS SEMI -TRAILERS RIGID TRUCKS SEMI -SEMI-4 VANS, TANKERS OVER GGM VANS & TRAILERS. TRAILERS. TANKERS Vans , Flat Top Trucks. TOTALS **TYPE** 1 2 4 5 6 TIME PM 3 23 1 24 48 2.00 Α <u>...</u> 1 4 3 В 1 1 1 3 C 2.30 25 26 51 2.30 Α 2 2 В 2 1 1 C 3.00 23 49 26 3.00 Α 3 1 4 В 1 2 4 . 1 С 3.30 21 35 56 3.30 Α 1 1 В 8 3 3 1 1 4.00 C 63 2 22 38 1 4.00 Α 1 1 В 2 3 4.30 C 1 1 23 63 2 37 4.30 Α 5 3 8 В 3 1 1 1 5.00 C 71 25 38 4 2 2 5.00 Α 0 В 2 2 C 5.30 63 2 1 33 27 5.30 Α 1 1 В 2 2 С 6.00 OLD NORTHERN ROAD 9 4 ~

-jic waranan - -.



APPENDIX A

<u>Arrahika</u>

**Hourly Volume By Day** 

Week Commencing: Sunday, 22/11/1998

**Site:** 335

Location: OLD NORTHERN ROAD

**Direction**: Northbound

Day	Sı	un	М	on	Tu	ies	W	ed	Ti	hur	F	ri	Sa	at
Time	22	/11	23	/11	24	/11	25	/11	26	/11	27	/11	28/	11
	С	T	С	T	С	T	С	T	С	Т	С	T	С	T
00.00			.8	0										
01.00			1	0		<b>-</b>								
02.00			3	1				• •						·
03.00			1	1										
04.00			2	2										
05.00			4	9										
06.00			24	11	17	8	21	13	17	6	16	5	16	8
07.00			23	10	34	10	32	9	32	9	24	13	26	8
08.00			31	15	33	10	37	15	47	14	41	8	38	9
09.00			37	14	25	17	36	17	33	11	31	14	75	7
10.00			40	19	34	24	33	12	- 22	12	33	16	79	10
11.00			33	14	43	20	30	20	28	18	52	15	127	8
12.00			35	12	38	8	42	14	33	11	34	11	97	1
13.00			39	11	39	13	48	12	30	14	51	8		
14.00			37	12	35	16	33	15	39	16	52	17		
15.00			41	10	62	11	38	6	57	19	61	14		
16.00			89	4	97	11	83	12	70	11	86	9		
17.00			90	7	88	3	71	· 7	93	6	92	7		
18.00			75	3										
19.00			39	0										
20.00			21	1										
21.00			18	0										
22.00			14	0										
23.00			10	0										
TOTAL	1165	44	714	176	742	175	726	174	721	172	864	162	1072	92

\* Legend

C: Cars and light Vehicles

**Hourly Volume By Day** 

Week Commencing: Sunday, 22/11/1998

**Site:** 335

**Location: OLD NORTHERN ROAD** 

**Direction:** Southbound

Day	Sı	ın	М	on	Τι	ies	W	/ed	Th	urs	F	-ri	S	at
	22/1	<b>1/98</b>	23/	1/98	24/	1/98	25/	1/98	26/	1/98	27/1/98		28/	1/98
Time	С	Т	С	T	C	Т	С	Т	С	T	С	Т	С	Т
00.00			1	4	•		i							
01.00			2	3										
02.00			4	2										
03.00			2	0										
04.00			6	1										
05.00			37	3										
06.00			83	22	74	21	71	24	64	24	81	23	26	24
07.00			113	12	96	15	102	13	107	9	85	10	36	10
08.00			84	12	82	24	76	11	72	10	65	7	43	10
09.00			43	8	46	9	52	17	46	21	48	15	44	7
10.00			39	15	40	23	35	5	50	12	50	10	41	6
11.00			28	9	35	12	35	12	39	14	31	12	46	5
12.00			36	13	32	10	39	15	35	11	39	10	54	0
13.00	•=		49	14	35	12	30	13	30	16	46	15		
14.00			51	12	45	12	38	14	37	7	41	15		
15.00			55	6.	54	12	43	17	38	15	40	6		
16.00			47	6	30	6	44	8	44	7	51.	7		
17.00			32	5	38	6	53	5	36	5	48	6	-	
18.00			15	2										
19.00			11	2										
20.00			10	1										
21.00			2	1										
22.00			4	0										
23.00			2	0										
TOTAL	1639	58	756	156	728	170	735	169	726	173	764	158	840	89

\*Legend

C: Cars and Light Vehicles

**Hourly Volume By Day** 

Week Commencing: Sunday, 22/11/1998

Site:

336

**Location: WISEMANS FERRY ROAD** 

**Direction:** Northbound

Day	Sı	ın	M	on	Τι	ies	W	ed	Th	nur	F	-ri	S	at
Time	22/	11	23	/11	24	/11	25	/11	26	/11	27	/11	28	/11
	С	T	С	T	С	Т	С	T	С	T	С	Т	С	Т
00.00									<u> </u>					
01.00				-										
02.00														
03.00														
04.00														
05.00														
06.00			50	16	50	13	45	15	51	15	57	13	29	15
07.00			67	12	62	16	66	15	70	13	60	13	27	9
08.00			50	12	50	13	48	8	51	8	54	6	31	9
09.00			29	11	39	11	40	14	33	19	41	13	37	7
10.00			26	13	24	18	33	12	27	5	47	9	60	8
11.00	<u>-</u>		34	8	37	9	28	8	35	16	25	12	61	5
12.00			42	9	37	13	29	7	37	12	39	13	60	2
13.00		-	37	13_	31	11	30	12	28	11	41	14		
14.00			25	7	36	9	19	13	45	6	51	16		
15.00			44	4	34	10	42	4	40	8	41	6		
16.00			43	7	42	4	41	9	57	9	57	7		
17.00			38	4	50	4	62	3	40	3	57	4		
18.00														
19.00														
20.00												<del></del>		
21.00														
22.00														
23.00														
TOTAL	1077	43	575	130	607	148	600	141	623	143	752	146	783	72

\* Legend

C: Cars and light Vehicles

**Hourly Volume By Day** 

Week Commencing: Sunday, 22/11/1998

**Site**: 336

**Location: WISEMANS FERRY ROAD** 

**Direction:** Southbound

Day	S	un	M	on	Tu	ies	W	/ed	TI	hur	F	-ri	S	at
Time	22	/11	23	/11	24	/11	25	/11	26	/11	27	//11	28	/11
	С	T	С	T	С	Т	С	T	С	T	С	T	С	Т
00.00														
01.00		·												
02.00														
03.00														
04.00											1			
05.00														
06.00			29	11	17	7	23	8	11	6	16	3	14	6
07.00			27	9	39	10	29	5	29	6	38	11	20	4
08.00			24	10	44	12	34	11	36	8	40	9	37	9
09.00			36	13	37	11	36	17	50	11	45	13	51	8
10.00			31	13	34	15	36	15	35	6	33	13	55	4
11.00			35	7	29	14	30	11	29	17	51	10	84	7
12.00			43	7	31	16	31	12	45	10	33	12	62	2
13.00			37	11	26	9	38	9	33	15	33	11		
14.00			36	8	35	18	30	9	31	18	51	20		
15.00			39	11	55	17	56	10	48	14	57	19		
16.00			72	8	61	8	67	11	61	10	53	6		•
17.00			54	9	52	6	57	7	62	8	68	5		
18.00							_							
19.00														
20.00														
21.00														
22.00						· · · · · · · · · · · · · · · · · · ·								
23.00														
TOTAL	941	42	569	128	581	161	584	145	603	148	671	153	727	77

\* Legend

C: Cars and light Vehicles

APPENDIX C

TABLE C1 Existing Average Hourly Heavy Truck Volumes

Monday to Friday on Wisemans Ferry Road and Old Northern Road

Station 2 Stations 335 & 336 (Period 15.19.97 to 21.10.97) (Period 22.11.98 to 28.11.98

Sto	ation		nern Road ion 2	Stat	Ferry Road ion 3 on 336	Old Northern Road Station 335		
Time		North Bound	South Bound	North Bound	South Bound	North Bound	South Bound	
6.00 - 7.00	0 am	5.0	1.8	14.4	7.0	8.6	22.8	
7.00 - 8.00	) am	7.6	2.4	13.8	8.2	10.2	11.8	
8.00 - 9.00	) am	8.6	3.6	9.4	10.0	12.4	12.8	
9.00 - 10.00	O am	8.0	3.8	13.6	13.0	14.6	14.0	
10.00-11.00	) am	9.6	4.0	11.4	12.4	16.6	13.0	
11.00-12.00	) am	11.0	3.4	10.6	11.8	17.4	11.8	
12.00 - 1.00	) pm	6.8	4.0	10.6	11.4	11.2	11.8	
1.00 - 2.00	) pm	11.6	4.0	12.2	11.0	11.6	14.0	
2.00 - 3.00	) pm	7.6	2.6	10.2	14.6	15.2	12.0	
3.00 - 4.00	) pm	6.2	4.2	6.4	14.2	12.0	11.2	
4.00 - 5.00	) pm	4.4	2.6	7.2	8.6	9.4	6.8	
5.00 - 6.00	) pm	3.8	1.2	. 3.6	7.0	6.0	5.4	
(6.00am to 6.00 pm) TO	TAL	90.2	37.6	123.4	129.2	145.2	147.4	
(24 hours) TO	TAL	106.4	44.6	141.6	147.0	171.8	165.2	

TABLE C2

## Increase in Heavy Trucks Generated By Contimuing Operations And Hourly Distribution To Old Northern Road And Wisemans Ferry Road

### **MONDAYS TO FRIDAYS**

	Station		nern Road ion 2		Ferry Road n 336	Old Northern Road Station 335		
Time		South Bound	North Bound	South Bound	North Bound	South Bound	North Bound	
	6.00 - 7.00 am	+ 5	+11	+2.5	+ 5.5	+ 2.5	+ 5.5	
	7.00 - 8.00 am	+1.8	+3.7	+0.9	+1.85	+0.9	+1.85	
	8.00 - 9.00 am	+ 3.9	-1.3	+1.95	-0.65	+1.95	-0.65	
	9.00 - 10.00 am	-1.7	+2.7	-0.85	+1.35	-0.85	+1.35	
	10.00-11.00 am	+1.7	-1.3	+0.85	-0.65	+0.85	-0.65	
	11.00-12.00 am	+2.8	-6.8	+1.40	-3.4	+1.40	-3.4	
	12.00 - 1.00 pm	-2.9	0	-1.45	0	-1.45	0	
	1.00 - 2.00 pm	+2.9	+2.3	+1.45	+1.15	+1.45	+1.15	
	2.00 - 3.00 pm	+ 1.8	+3.7	+0.9	+1.85	+0.9	+ 1.85	
	3.00 - 4.00 pm	+2.9	+2.3	+1.45	+1.15	+1.45	+1.15	
	4.00 - 5.00 pm	+1.8	+3.7	+0.90	+1.85	+0.90	+ 1.85	
	5.00 - 6.00 pm	0	0	0	0	0	0	
	TOTAL	20	20	10	10	10	10	

TABLE C3 Existing Average Hourly Plus increase in Continuing Operations
Heavy Truck Volumes on Wisemans Ferry And Road Old Northern Road
MONDAY to FRIDAY

Station 2 15.10.97 to 21.10.97 Station 335 & 336 22.11.98 to 28.11.98

Stati	1	hern Road tion 2	1	Ferry Road on 336	Old Northern Road Station 335		
Time	North Bound	South Bound	North Bound	South Bound	North Bound	South Bound	
6.00 - 7.00 a	am 16	6.8	19.9	9.5	14.1	25.3	
7.00 - 8.00 a	am 11.3	4.2	15.65	9.1	12.05	12.70	
8.00 - 9.00 a	am 7.3	7.5	8.75	11.95	11.75	14.75	
9.00 - 10.00 a	am 10.7	2.1	14.95	12.15	15.95	13.15	
10.00-11.00 8	am 8.3	5.7	10.75	13.25	15.95	13.85	
11.00-12.00 8	am 4.2	6.2	7.2	13.20	14.0	13.20	
12.00 - 1.00 բ	om 6.8	1.1	10.6	9.95	11.20	10.35	
1.00 - 2.00 բ	om 13.9	6.9	13.35	12.45	12.75	15.45	
2.00 - 3.00 p	om 11.3	4.4	12.05	15.50	17.05	12.90	
3.00 - 4.00 p	om 8.5	7.1	7.55	15.65	13.15	12.65	
4.00 - 5.00 p	om 8.1	4.4	9.05	9.50	11.25	7.70	
5.00 - 6.00 p	om 3.8	1.2	3.6	7.0	6.0	5.4	
(6.00am to 6.00 pm) TOTA	L 110.2	57.6	133.4	139.2	155.2	157.4	
(24 hours) TOTA	L 126.4	64.6	151.6	157.0	181.8	175.2	

TABLE C4 Existing Hourly Heavy Truck Volumes on Old Northern Road And Wisemans Ferry Road

### **SATURDAYS**

Station	Old Northern Road		Wisemans Ferry		Old Northern Road	
	Station 2		Road Station 336		Station 335	
Time	North	South	North	South	North	South
	Bound	Bound	Bound	Bound	Bound	Bound
6.00 - 7.00 am	7	0	15	6	8	24
7.00 - 8.00 am	4	1	9	4	8	10
8.00 - 9.00 am	10	1	9	9	9	10
9.00 - 10.00 am	9	2	7	8	7	7
10.00-11.00 am	12	4	8	4	10	6
11.00-12.00 am	11	0	5	7	8	5
12.00-1.00 pm	5	3	2	2	1	0
1.00-2.00 pm	NA	NA	NA	NA	NA	NA
2.00-3.00 pm	NA	NA	NA	NA	NA	NA
3.00-4.00 pm	NA	NA	NA	NA	NA	NA
4.00-5.00 pm	NA	NA	NA	NA	NA	NA
5.00-6.00 pm	NA	NA	NA	NA	NA	NA
(6.00 - 1.00 pm) TOTAL	58	11	55	40	51	62
(24 Hours) TOTAL	86	25	77	72	92	89

\* NOTE: NA = Not Available

TABLE C5 Increase in Heavy Trucks Generated By Continuing Operations And Hourly Distribution To Old Northern Road And Wisemans Ferry Road Saturdays.

Station	Old Northern Road Station 2		Wisemans Ferry Road Station 336		Old Northern Road Station 335	
Time	North Bound	South Bound	North Bound	South Bound	North Bound	South Bound
6.00 - 7.00 am	+14.3	+11.7	+7.15	+5.85	+7.15	+5.85
7.00 - 8.00 am	+ 3.0	-0.7	+1.5	-0.35	+1.5	-0.35
8.00 - 9.00 am	-2.7	+3.7	-1.35	+1.85	-1.35	+1.85
9.00 - 10.00 am	+2.7	-1.7	+1.35	-0.85	+1.35	-0.85
10.00-11.00 am	-2.7	+ 3.7	-1.35	+1.85	-1.35	+1.85
11.00-12.00 am	+2.7	+2.3	+1.35	+1.15	+1.35	+1.15
12.00-1.00 pm	+2.7	+5	+1.35	+2.5	+1.35	+2.50
1.00-2.00 pm	+5	+4	+2.5	+2	+2.5	+2
2.00-3.00 pm	+ 5	+4	+2.5	+2	+2.5	+2
3.00-4.00 pm	+5	+4	+2.5	+2	+2.5	+2
4.00-5.00 pm	+ 5	+4	+2.5	+2	+2.5	+2
5.00-6.00 pm	0	0	0	0	0	0
6.00am - 6.00 pm) TOTAL	40	40	20	20	20	20

TABLE C6 Existing Hourly Plus Increase in Continuing Operations Heavy Truck Volumes on Old Northern Road And Wisemans Ferry Road SATURDAYS

Station	Old Northern Road		Wisemans Ferry		Old Northern Road	
	Station 2		Road Station 336		Station 335	
Time	North	South	North	South	North	South
	Bound	Bound	Bound	Bound	Bound	Bound
6.00 - 7.00 am	21.3	11.7	22.15	11.85	15.15	29.85
7.00 - 8.00 am	7.0	0.3	10.5	3.65	9.5	9.65
8.00 - 9.00 am	6.3	4.7	7.65	10.85	7.65	11.85
9.00 - 10.00 am	11.7	0.3	8.35	7.15	8.35	6.15
10.00-11.00 am	9.3	7.7	6.65	5.85	8.65	7.85
11.00-12.00 am	13.7	2.3	6.35	8.15	9.35	6.15
12.00-1.00 pm	7.7	8.0	3.35	4.5	2.35	2.50
1.00-2.00 pm		-				
2.00-3.00 pm						
3.00-4.00 pm			·			
4.00-5.00 pm						
5.00-6.00 pm						
(6.00 - 1.00 pm) TOTAL	77	35	65	52	61	74
(24 Hours) TOTAL	126	65	97	92	112	109

**Traffic Counting Supplies & Service (02) 476-6266** 

**Hourly Volume By Day** 

Week commencing: Wednesday, 15/10/1997

Site:

138

Location: 2

**Direction:** South Bound

**APPENDIX B** 

Day	T	ue	W	ed	Tł	nur	F	ri	Sa	at	Sı	ın	M	on
Time	21	/10	15.	/10	16	/10	17	/10	18/	10	19	/10	20	/10
	С	Т	С	T	С	Т	С	Т	С	Т	С	Т	С	T
00.00	1	1	0	0	0	0	1	0	4	0	24	1	2	1
01.00	1	0	0	0	3	0	1	0	4	0	24	0	0	.0
02.00	4	0	5	0	2	0	5	0	4	1	9	0	3	0
03.00	1	0	1	0	2	0	2	0	1	0	17	0	0	0
04.00	5	0	6	1	9	2	5	2	4	0	9	0	7	0
05.00	29	2	30	0	27	1	35	3	15	3	13	1	29	0
06.00	55	1	55	4	58	3	63	1	25	0	20	0	63	0
07.00	81	6	84	2	74	0	75	3	52	1	30	0	80	1
08.00	81	7	69	3	86	3	73	3	50	1	42	1	70	2
09.00	54	5	53	3	65	4	55	3	64	2	65	6	61	4
10.00	67	10	52	4	53	2	73	2	64	4	59	4	50	2
11.00	39	6	48	2	44	3	47	3	56	0	67	5	51	3
12.00	47	5	57	6	54	4	53	4	54	3	71	0	46	1
13.00	50	7	51	2	50	2	61	4	80	0	113	3	54	5
14.00	59	7	63	1	61	2	65	1	86	3 ·	154	4	63	2
15.00	72	8	61	2	63	1	81	5	100	2	167	6	55	5
16.00	55	3	64	2	68	3	70	2	106	2	254	15	52	3
17.00	34	0	44	2	64	2	51	1	90	0	178	4	40	1
18.00	25	2	23	1	51	3	45	3	50	1	111	1	33	2
19.00	12	3	15	0	16	1	17	1	31	0	44	1	15	2
20.00	5	1	15	1	20	0	15	0	20	0	37	0	14	0
21.00	9	0	11	1	11	1	3	0	28	2	16	0	7	1
22.00	7	0	11	0	5	0	12	1	14	.0	4	0	10	1
23.00	2	0	3	0	9	0	7	0	27	0	8	1	3	0
TOTAL	795	74	821	37	895	34	915	42	1029	25	1536	52	818	36

\* Legend

C: Cars and light Vehicles

T: Heavy Trucks

**Traffic Counting Supplies & Service (02) 476-6266** 

**Hourly Volume By Day** 

Week commencing:

Wednesday, 15/10/1997

Site:

138

Location: 2

Direction: N

Northbound

Day	T	ue	W	ed	Tł	nur	F	ri	Si	at	Sı	ın	M	on
Time	21	/10	15	/10	16	/10	17.	/10	18/	10	19,	/10	20	/10
	C	Т	С	T	С	Т	С	T	С	T	С	T	С	T
00.00	4	1	5	0	4	0	6	0	13	0	21	0	3	0
01.00	3	0	2	0	2	0	2	0	4	0	14	3	2	0
02.00	2	0	1	0	2	0	1	0	3	0	2	0	0	0
03.00	1	0	0	0	0	0	3	0	0	0	6	0	0	0
04.00	4	0	5	0	4	0	6	2	9	2	10	0	7	0
05.00	20	7	24	14	14	9	17	8	15	8	12	2	19	9
06.00	29	6	29	3	27	5	26	8	22	7	14	0	27	3
07.00	35	9	43	8	49	8	40	6	44	4	25	1	45	7
08.00	52	16	53	9	44	7	50	7	63	10	58	3	40	4
09.00	62	15	47	4	46	5	55	6	64	9	64	3	54	10
10.00	54	11	49	5	47	7	73	14	112	12	141	8	50	11
11.00	73	18	66	8	66	11	69	9	122	11	166	2	60	9
12.00	47	8	59	6	51	7	57	8	108	5	145	2	51	5
13.00	51	18	54	6	66	11	61	7	115	6	131	2	50	16
14.00	58	14	53	8	41	4	69	3	125	4	83	2	66	9
15.00	59	9	56	3	61	3	89	11	109	3	71	0	56	5
16.00	63	3	78	8	77	5	82	4	72	0	44	2	81	2
17.00	79	2	65	1	76	4	98	4	78	2	46	0	78	8
18.00	62	3	59	1	70	2	90	3	47	0	35	0	67	0
19.00	36	2	46	1	42	1	61	3	51	0	21	0	31	1
20.00	13	1	26	1	30	0	49	2	78	1	18	0	20	1
21.00	21	0	15	1	29	1	32	3	172	1	8	0	14	1
22.00	12	0	18	1	20	1	27	0	135	0	9	0	18	0
23.00	8	0	16	0	13	0	20	0	66	1	5	0	7	0
TOTAL	848	143	869	88	881	91	1083	108	1627	86	1149	30	846	101

\* Legend

C: Cars and light Vehicles

T: Heavy Trucks

APPENDIX D

# AUSTRALIAN GRCS-5 GOLDEN RIVER CLASSIFICATION SCHEME 5

CNAASRA LEVEL 2 CLASS SCHEMES

CL!	0.00
	UXHICLX
ч.	DESCRIPTION
1	CAR, LIGHT VAH, TAXI 2 AXLES 8.8 TO 3.8 METERS
2	CAR HITH TRAILER 3,4 OR 5 AXLES 3.8 TO 7.5 METERS
3	ACTION LENGTH VEHICLE 2 AXLES 3.8 TO 7.5 METERS
3	MEDIUM LENGTH BUS OR COACH 2 AXLES 2.0 TO 7.5 METERS
4	MIDIUM LENGTH IRUCK OR CORCH 3 AXLES 5.8 TO 7.5 KETERS
5	MEDIUM LENGTH UZNICLE 4 AXLES 3.8 TO 7.5 METERS
6	LONG LENGTH VEHICLE  3 AXLES 7.5 TO 18.5 METERS
6	LONG LENGTH BUS (ARTICULATED) 3 AXLES 7.5 TO 18.5 METERS
7	LONG LENGTH VEHICLE (ARTICULATED) 4 AXLES 7.5 TO 18.5 METERS
7	RIGID 2 AXLE TRUCK + 2 AXLE TRAILER 4 AXLES 7.5 TO 18.5 METERS
8	LONG LENGTH VEHICLES (ARTICULATED)  5 AXLES 7.5 TO 18.5 HEIERS
8	RIGID 3 AXLE TRUCK + 2 AXLE TRAILER 5 AXLES 7.5 TO 18.5 METERS
9	LOHO LENGTH VENICLES (ARTICULATED)  6 AXLES 7.5 TO 18.5 METERS
9	RIGID 2 AXLE TRUCK + 3 AXLE TRAILER  6 AXLES 7.5 TO 18.5 METERS
10	LONG LENGTH VEHICLES 7 OR 8 AXLES 7.5 TO 18.5 METERS
11	MEDIUM COMBINATION UEHICLES ("B" DOUBLES +to) 5 TO 11 AXLES 18.5 TO 34.8 METERS
12	LONG COMBINATION UEHICLLES (ROAD TRAINS +to) 6 TO 19 AXLES AND GREATER THAN 34 METERS
13	ALL OTHER VEHICLES

#### 2.3 TRANSPORT

#### Element Objectives:

- To maintain and upgrade the safety and efficiency of the existing external road network;
- ♦ To provide safe, co-ordinated and controlled transport links for Extractive Industries; and
- ♦ To protect and maintain the safety and amenity of existing rural and residential activities.

#### Performance Criteria:

- Extractive operations should use controlled and limited access points to main roads;
- Transport routes and their access points should be located, designed, constructed and maintained to conserve:-
  - the amenity and safety of community facilities;
  - the amenity of properties not associated with extraction; and
  - · areas of environmental sensitivity.

- Extractive operations should provide safe and direct internal Haul road link between extraction sites, processing areas and the external road system;
  - Achieving this arrangement may depend upon private and legal binding agreements between operators and landowners for the full life of the activity.
- Internal access arrangements for Extractive Industries should be in accordance with established and recognised road construction standards.

#### Prescriptive Measures:

An internal access carriageways associated with Extractive Industries should be no less than 20m wide, as illustrated in <u>Figure 4: Typical Cross</u> <u>Section of Internal Access Road</u>;

Alternative designs of internal access and intersection points may be considered by Council having regard to the requirements of:-

- specific needs of the operation and site characteristics;
- · Austroads: Guide to Traffic Engineering Practice;
- RTA: Road Design Guide;
- RTA: Guide to Traffic Generating Developments;
- or other designs agreed to by the Roads & Traffic Authority (RTA).
- Internal access carriageways associated with Extractive Industries should be set back no less than:-
  - 10m from adjoining property boundaries:
  - 50m from environmentally sensitive areas including habitats of threatened species;
  - 100m from residences not associated with extraction.
- ► The location of any internal access carriageway is flexible and may change depending upon alternative routes, environmental & physical constraints and the nature & value of the underlying resource;

- ► The standard of construction of Internal Access Carriageways shall have regard to:
  - Cross sectional characteristics, including straight runs, curves and bends;
  - Horizontal and Vertical alignment characteristics;
  - Pavement & drainage proposals
  - Other Technical parameters; and
  - Suitable vehicle grades.
- ► In preparing extractive industry proposals reference should be made to the provisions of the Roads Act and State Environmental Planning Policy No.11 -Traffic Generating Developments;
- Certified weighbridge dockets and a log book to verify the frequency and timing of vehicle movements may be required as a condition of consent.

### Appendix A: SEPP 11

### State Environmental Planning Policy No. 11 Traffic Generating Developments

#### . Citation

1. This State environmental planning policy may be cited as "State Environmental Planning Policy No.11 Traffic Generating Developments".

#### Aims, objectives, etc.

- 2. The aims, objectives, policies and strategies of this Policy are to ensure that the Roads and Traffic Authority
  - (a) is made aware of; and
  - (b) is given an opportunity to make representations in respect of, developments referred to in Schedule 1 or 2.

#### Interpretation

- 3. (1) In this Policy, except in so far as the context or subject matter otherwise indicates or requires- "arterial road" means-
  - (a) a road shown on a map or an environmental planning instrument by-
    - (i) a continuous or intermittent red line on white between firm black lines;
       or
    - (ii) a broken red band on white between black lines:
  - (b) a road proclaimed to be a main road under either the Roads Act 1993; and
  - (c) a road declared to be a secondary road under the Roads Act 1993;

"roadside stall" means a building or place where only primary products produced on the property on which the building or place is situated are exposed or offered for sale;

"Roads and Traffic Authority " means the Roads and Traffic Authority of New South Wales.

(2) A reference in Schedule 1 or 2 to the erection of a building does not include a reference to the making of structural alterations to the building, except where the structural alternations have the effect of increasing the gross floor area beyond the figure specified in Schedule 1 or 2 in relation to the building.

APPENDIX E



#### Application of Policy

4. This Policy applies to the State.

Certain provisions in environmental planning instruments to be of no force or effect.

5. A provision contained in any other environmental planning instrument requiring a consent authority, before determining a development application, to consult with and to take into consideration in determining that application any representations of the Police Service or the Roads and Traffic Authority shall, to the extent only of the requirement, be of no force or effect.

#### Model Provisions

6. The definitions in clause 4(1) of the Environmental Planning and Assessment Model Provisions, 1980 (except for the definitions of 'arterial road', 'general store', 'main road' and 'roadside stall') are adopted for the purposes of this Policy.

Development applications to be referred to the Roads and Traffic Authority.

- 7. (1) Subject to subclause (2), this clause applies to applications for development consent to carry out development specified in Schedule 1 or 2.
- (2). Where the Roads and Traffic Authority has notified a consent authority that this clause does not apply to a development application (whether by reference to the type, purpose or location of the development the subject of the application or otherwise) this clause shall not apply to that development application.
- (3). Where a consent authority receives a development application to carry out development specified in Schedule 1, the consent authority shall, within 7 days of its receipt of the application, forward a copy of the application to the Roads and Traffic Authority.
- (4). Where a consent authority receives a development application (other than a development application to which subclause (3) relates) to carry out development specified in Schedule 2, being development on or of land that has direct vehicular or pedestrian access to-
  - (a) an arterial road; or
  - (b) a road connecting with an arterial road, if the access is within 90 metres (measured along the road alignment of the connecting road) of the alignment of the arterial road, the consent authority shall, within 7 days of its receipt of the application, forward a copy of the application to the Roads and Traffic Authority
- (5) Where a copy of a development application has been forwarded to the Roads and Traffic Authority pursuant to subclause (3) or (4), the consent authority shall not determine the application until-



- (a). it has received a representation with respect to the application from the Roads and Traffic Authority, or
- (b). the Roads and Traffic Authority has informed the consent authority that it does not wish to make any representation with respect to the application; or
- (c). 21 days have elapsed after the date on which the copy of the application was forwarded to the Roads and Traffic Authority:

whichever first occurs.

(6). The consent authority shall forward to the Roads and Traffic Authority a copy of any determination of a development application referred to in subclause (3) or (4) when giving notice of that determination to the application pursuant to section 92 of the Act.

#### **SCHEDULE 1**

Development for the purpose of or being -

- (a). the erection of, or conversion of a building into, a residential flat building comprising 300 or more dwellings or the enlargement of extension of a residential flat building by the addition of 300 or more dwellings;
- (b). the erection of a building for the purposes of shops where the gross floor area of the building is or exceeds 2,000 square metres or the englargement or extension of a building used for the purposes of shops where the gross floor area of the enlargement or extension is or exceeds 2,000 square metres;
- (c). the erection of a building for the purposes of shops and commercial premises where the gross floor area of the building is or exceeds 4,000 square metres or the enlargement or extension of a building used for the purposes of shops and commercial premises where the gross floor area of that enlargement or extension is or exceeds 4,000 square metres;
- (d). the erection of a building for the purposes of commerical premises where the gross floor area of the building is or exceeds 10,000 square metres or the enlargement or extension of a building used for the purposes of commerical premises and industry where the gross floor area of that enlargement or extension is or exceeds 10,000 square metres;

APPENDIX É



- (e). the erection of a building for the purposes of commerical premises and industry where the gross floor area of the building is or exceeds 15,000 square metres or the enlargement or extension of a building used for the purposes of commerical premises and industry where the gross floor area of that enlargement or extension is or exceeds 15,000 square metres;
- (f). the erection of a building for the purposes of industry where the gross floor area of the building is or exceeds 20,000 square metres or the enlargement or extension of a building used for the purposes of industry where the gross floor area of that enlargement or extension is or exceeds 20,000 square metres;
- (g). subdivision of land into 200 or more allotments where the subdivision includes the opening of a public road;
- (h). drive-in theatres of the enlargement or extension of existing drivein theatres so as to enable the accommodation of more than 200 motor vehicles;
- (i). educational establishments accommodating 50 or more students or the enlargement or extension of existing educational establishments to accommodate an additional 50 or more students;
- (j). transport terminals, bulk stores, container depots or liquid fuel depots or the enlargement or extension of any existing transport terminal bulk store, container depot or liquid fuel depot by increasing by more than 8,000 square metres the area of land or the gross floor area of buildings used for that purpose;
- (k). junk yards or depots or regional depots, within the meaning of the Waste Disposal Act, 1970;
- (l). heliports, airports or acordromes;
- (m). extractive industry or mining;
- (n). areas used exclusively for parking or any other development having ancillary accommodation for 200 or more motor vehicles, or the enlargement or extension of a parking area where the enlargement or extension accommodates 200 or more motor vehicles.

APPENDIX E

## Appendix C7 – Flora and Fauna Assessment

#### SAND EXTRACTION at MAROOTA

LOTS 29 and 196 DP752025, OLD NORTHERN ROAD **DIXON SANDS** 

### FLORA & FAUNA ASSESSMENT STAGE ONE

February 1999

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#### SAND EXTRACTION AT MAROOTA LOTS 29 and 196 DP752025, OLD NORTHERN ROAD DIXON SANDS

### FLORA & FAUNA ASSESSMENT REPORT STAGE ONE

#### February 1999

#### 1 INTRODUCTION

Dixon Sands Pty Ltd operates an existing sand extraction facility at Maroota, on Lots 29 and 196 DP 752025, Old Northern Road. The existing sand extraction activity has been conducted for a number of years at this location, involving the removal of vegetation (native and/or horticultural), the removal and stockpiling of topsoil, extraction of sand, earthworks and the creation of sediment and stormwater ponds, and eventual regrading of the landscape and rehabilitation works. Most of Lots 29 and 196 have been cleared and modified for the sand extraction operation, with only the western part of Lot 29 and the southwestern corner of Lot 196 retaining a native vegetation cover.

The Stage 1 Flora & Fauna Assessment report addresses the existing activities on the subject site, in response to the decision of the Land & Environment Court of NSW (Proceedings No 401309 of 1998 - Baulkham Hills Shire Council v Dixon Sands (Penrith) Pty Ltd and Anor). The Land & Environment Court has determined that the use of the "subject land for extractive industry and sand mining" is to cease until the granting of development consent pursuant to the NSW Environmental Planning & Assessment Act 1979 (EP&A Act).

In response to the finding of the Land & Environment Court, an investigation of the existing operations of Dixon Sands at Maroota with respect to the natural environment has been conducted:

- to identify and describe the effects of the operation on adjoining bushland;
- to determine to the significance of impacts which may be or are being imposed upon adjacent native vegetation and fauna habitats; and
- to provide recommendations for impact amelioration and environmental management to reduce adverse impacts and to enhance the natural environment.

#### 2 FLORA & FAUNA SURVEY

Several investigations for flora and fauna have been conducted on the site of the existing sand extraction operation at Maroota, and around its periphery, specifically addressing issues arising from the existing operation (this report). Additional flora and fauna investigations have been conducted on adjacent lands (to the north and east) by Gunninah Environmental Consultants (GECon), and a number of other flora and fauna investigations have been conducted either on the subject site or in the vicinity.

As noted above, this report (the Stage 1 Flora & Fauna Assessment report) addresses the existing sand extraction operation at Maroota, which only involves a continuation of sand extraction within the already disturbed areas of Lots 29 and 196, and does not involve the further extension of extraction activities.

Specific investigations of the existing operation which have been conducted for the preparation of this report have included:

- a site inspection in May 1998 to obtain an overview of the extraction activity and of its potential effects on adjoining vegetation and fauna habitats;
- a walked survey of the upper reaches of the creekline which flows through the southwestern corner of Lot 196 (in an area of retained natural vegetation). A detailed investigation of the vegetation along this portion of the creekline was

conducted on the 15th of June 1998, and the upper portions of the creekline were also inspected for native fauna and fauna habitats, and the extent of disturbance to native vegetation and fauna habitats. The nature and condition of the creekline, and the levels of disturbance of the creekline and of adjacent riparian vegetation were recorded:

- a walked survey of the whole of the boundary of Lots 29 and 196 on the 16th of January 1999, to identify and document areas of disturbance arising from the existing operation and the intensity and extent of adverse impacts on adjacent vegetation. In particular, observations were made of the extent of sediment discharge into adjoining vegetation;
- a supplementary walked survey of the boundary and along the southwestern creekline on the 23rd of January, following three days of significant rainfall, to document impacts arising from the rain event (if any); and
- inspection of the stand of *Kunzea rupestris*, a threatened plant pursuant to the *NSW Threatened Species Conservation Act 1995* (TSC Act), which occurs on the eastern part of Lot 29 and on adjoining land. The stand of *Kunzea rupestris* was investigated in May and June of 1998, and in January of 1999.

Other investigations of flora and fauna have been conducted by GECon in the vicinity, including on the adjacent Crown road easement along the northern boundary of the subject site, and in Lots 1 and 2 which are located between the eastern boundary of Lot 196 and the Old Northern Road. Investigations in these areas involved site inspections, detailed flora surveys and dedicated fauna surveys, with both flora and fauna investigations involving dedicated surveys for threatened species known to occur in the general locality. Whilst these other flora and fauna investigations are not directly relevant to the existing extraction operation, they do provide some background information regarding the flora and fauna assemblages of the vicinity, and indicate flora and fauna species which could theoretically or potentially be affected by indirect impacts arising from the existing operation.

Other investigations have been conducted on the natural environment on the subject site or in the vicinity, including:

- a survey of the natural vegetation of part of Lots 29 and 196 (Straede 1992a) which contributed to the *Environmental Impact Statement Extractive Industry* prepared for Dixon Sands (Penrith) Pty Ltd by Taylor Thomson Whitting;
- a report on the condition of the stand of *Kunzea rupestris* at the junction of Lots 198, 29 and 213, Maroota (Straede 1992b); and
- a fauna survey conducted for the existing sand extraction operation (MKES 1992).

#### 3 THE EXISTING ENVIRONMENT

The areas which are the subject of this investigation and report have been used for ongoing sand extraction activities over a long period, and are essentially devoid of native vegetation (with the exception of water plants in several dams and small areas of shrubby regrowth). The area which is the subject of this report is, however, boarded by native vegetation to its north, west, southwest and southeast. The southern boundary of the subject site (Lots 29 and 196) abuts another sand extraction operation, and most of the eastern boundary abuts existing cleared agricultural land.

Whilst most of the subject site has been highly disturbed as a result of the existing sand extraction operations, two parts of the land have been retained with a covering of native vegetation. The southwestern part of Lot 196 retains the native forest vegetation, and has been excluded from extraction activities. Similarly, the western extremity of Lot 29 retains a sandstone shrub vegetation cover, including part of the stand of *Kunzea rupestris*. In addition, Lot 196 is bounded on its western side by extensive forest and woodland vegetation (typical of the Sydney Sandstone environment), and the northern boundary of Lot 196 also abuts extensive areas of forest and sandstone shrub communities, although the eastern two-thirds of that boundary retains only a narrow strip of open forest vegetation within a road

reserve, with a substantial sand extraction operation immediately to the north. Lot 29 is principally surrounded by cleared agricultural land or existing sand extraction operations, although the western boundary abuts the extensive sandstone forest and shrub vegetation discussed above, and the southern half of the eastern boundary also abuts an area of native vegetation. In both instances, however, access roads separate the sand extraction operations from the adjoining native vegetation (Figure 2).

Native vegetation communities in the immediate vicinity include an array of vegetation typical of Sydney Sandstone environments, including Gully Open Forest, Ridgetop Open Forest/Woodland, Open Woodland, Shale/Sandstone Transition Forest, Ridgetop Scrub Heath, Maroota Sands Dry Heath and (artificial) Freshwater Wetlands. Straede (1992a) describes vegetation on parts of Lot 29 and 196 as an Open Scrub community, dominated by shrubs and small trees.

A number of threatened plant and animal species are known from the general locality, and two "endangered ecological communities" pursuant to the TSC Act are also known to occur in the locality. As noted above, Kunzea rupestris occurs at the western margin of Lot 29, and this part of the stand of K rupestris has been retained on the subject site (see discussion below). One additional threatened plant species, the Black-eyed Susan Tetratheca glandulosa, is also known to occur in bushland in vicinity. Threatened fauna species which are known to occur in the vicinity include the Yellow-bellied Glider (MKES 1992) and the Giant-burrowing Frog (NP&WS Wildlife Atlas). A number of other threatened fauna and flora species could potentially occur in the general vicinity, although the subject site itself is not regarded as of relevance for any such species.

The two "endangered ecological communities" which occur in the locality (Shale/Sandstone Transition Forest and Maroota Sands Swamp Forest) are not present on the subject site (ie that portion of the land which is affected by existing sand extraction operations). Generally, the vegetation communities immediately adjacent to the existing sand extraction operations are widespread in the sandstone environment which surrounds Sydney, and are extremely well conserved in the National Parks and Nature Reserves of the Sydney Basin region.

#### 4 IMPACTS of EXISTING ACTIVITY

#### 4.1 General

**Dry Weather Survey** 

The walked survey of the boundary of the existing sand extraction operation on Lots 29 and 196 at Maroota (the subject site) undertaken in dry weather conditions in early January 1999 revealed little evidence of existing or ongoing adverse impacts upon the natural environment (Plates 1-6).

The eastern boundary of the existing operations on Lot 196 are adjacent to an access road constructed for an adjoining sand extraction activity, and this area generally is highly disturbed and modified by roads, a weigh-bridge, buildings and other artificial features. There is no native vegetation in this vicinity, and there are no apparent adverse impacts upon the natural environment.

Existing retained vegetation on the eastern and northeastern parts of Lot 29 are essentially unaffected by extraction operations, either draining onto areas which have been cleared and disturbed or being separated by a small bund (20cm high) from cleared land. There is no evidence of any notable sediment discharge into bushland on the eastern or northern parts of Lot 29.

The southern boundary of Lot 29 is abutted by an unsealed private haul road/access road, which is located on Lot 198. The extraction operation on Lot 29 abuts the access road, and there is no relevant native vegetation along the southern boundary of Lot 29 to be affected.

The existing unsealed private access road, which is used by an adjoining sand extraction operator, is located in a Crown road reserve on the western and northern sides of Lot 29. This access road effectively isolates Lot 29 and the activities on it from the extensive areas

of adjacent bushland to the west. Consequently, the extraction activities on Lot 29 do not involve the imposition of direct or indirect adverse impacts upon native vegetation on land adjoining it.

There is one small portion of native heath ridgetop vegetation retained in the southwestern corner of Lot 29, above an existing operating sand extraction pit. This small stand of vegetation contains part of the known stand of *Kunzea rupestris*, although the stand has been bisected by the existing private access road within the Crown road reserve. As noted above, that access road is not utilised by Dixon Sands Pty Ltd. There is no evidence for adverse impacts from the sand extraction operation on Lot 29 on the stand of *Kunzea rupestris*.

The southern and western boundaries of the existing sand extraction operation on Lot 196 involve a number of existing bund walls and ponds which have been in place for some considerable time. All of the bund walls and slopes into adjacent vegetation are naturally regenerating, and whilst there is some evidence of limited erosion and sediment discharge in the past, there is no evidence for significant sediment loss currently from these relatively stable bund walls (Plates 1-6).

In particular, the banks adjacent to the retained bushland in the southwestern corner of Lot 196 are well-established, and support an array of native vegetation, as well as some introduced plants. These banks are well-vegetated, stable and regenerating, and do not contribute any notable or relevant sediment into the adjacent bushland. Furthermore, there is no evidence for a reduction of vigour in the vegetation downslope of these banks, with no evidence of either trees or shrubs being adversely affected by the existing activities. Similarly, the natural watercourse which flows through the bushland in the southwestern part of Lot 196 has been previously affected to only a limited extent by the sand extraction activities, and there is no evidence for any existing notable or significant adverse impacts upon this watercourse (see below).

As indicated above for the southern and southwestern parts of Lot 196, there is little evidence for current sediment discharge or erosion of the banks and bund walls on the western side of Lot 196, into the adjacent native bushland. Bund walls and banks adjacent to existing or previous earthworks along the western boundary are generally stable, and in many cases are well-vegetated by naturally regenerating native plants. Whilst there is evidence of previous sediment discharge in some locations, this is generally limited to a maximum discharge of 5 metres into adjacent bushland, and in most areas is less than 2 metres. These discharges are historical rather than current, and there is no evidence for significant adverse impacts arising from sediment discharges from the existing stable bund walls and banks on the western side of Lot 196.

The northern boundary of Lot 196 abuts a Crown road reserve which has remained undeveloped, and supports native vegetation. The eastern half of the Crown road reserve is at a slightly higher elevation than the adjoining Dixon Sands site, and there is only a small bund (formed by spillage from earth-moving machinery) between the disturbed surfaces on the sand extraction site and the remnant land surfaces within the Crown road reserve. Recent earthworks in this area have created a second small bund which is, in most areas, located within the Dixon Sands site and does not involve soil or sediment discharge into the Crown road reserve. Additionally, it should be noted that the older bund (which is just 20cm high or thereabouts) shows evidence of stabilisation, with native plants growing on it and through it. There is little or no evidence of sediment discharge into the Crown road reserve in this area (Plates 1 and 2).

The western half of the Crown road reserve is at a lower elevation than the sand extraction operation, and there is, in many places, a high (2m - 5m) embankment of sand and earth from the extraction area down to the adjacent vegetated land to the north. Most of this embankment has been in place for some considerable time, as indicated by natural regeneration and a range of native plant species growing on the top of the embankment and on its northern slope (Plates 3 and 4). As elsewhere, many of the plants in this area display good vigour, with a number of species flowering during the field inspection in January 1999.

As is the case elsewhere along the outer bund walls and embankments from the sand extraction area, there is little evidence of sediment discharge into adjacent bushland. In most areas, the embankments are well stabilised and are naturally revegetating, and evidence for sediment discharge indicates previous limited erosion with discharge plumes

often extending less than 2m into adjacent vegetation. At a few isolated sites, previous sediment discharge has extended further into the adjacent vegetation (up to 5m), although in all instances these areas currently display evidence of natural regeneration.

The one site at which some sediment discharge has occurred more extensively into the adjoining native vegetation is at the northwestern corner of Lot 196. At this site, drainage channels on the outer sides of the embankment (to the north and to the west) meet and discharge in a northwesterly direction into the adjacent vegetation (Plate 5). Erosion and sediment control measures have been implemented at this location, involving the installation of hay bales and a silt fence to retain sediment within the discharge channels. The hay bales, however, are degrading, and there has been some previous limited discharge of sediment through this channel. Conversely, there is only limited evidence for sediment deposition in the vegetation downslope of the embankment at this locality, with only small patches of sand occurring along a narrow band for up to 10m from the embankment toe. Many of these small sediment deposits are regenerating, and there is no evidence for a significant adverse impact upon the native vegetation, either in terms of the extent of sediment deposition or in terms of plant vigour.

#### Wet Weather Survey

The survey conducted on the 23rd of January 1999, following three days of heavy rain, provided corroborative evidence for the observations regarding sediment loss and discharge described above. In general, there was little evidence for any notable sediment discharge despite the heavy rainfall, with many portions of the boundary displaying essentially no evidence of erosion and sediment discharge into adjacent bushland (Plates 7 and 8). At a few locations, particularly along the northern boundary where some portions of the embankment are relatively exposed and have not been colonised by native plants, some minimal discharge of sediment for a few metres into adjacent bushland had occurred. However, even at these locations, the quantities of sediments discharged were extremely small and no significant impacts on plants were noted or are regarded as likely.

At one location along the northern boundary, however, a small erosion gully had formed in the embankment, resulting in the discharge of sediment into adjacent bushland (Plate 9). However, even at this location, the discharge of sediment occurred over an area extending no more than 8 metres from the foot of the embankment, and no significant smothering or covering of native vegetation was evident. Elsewhere, the embankment had remained essentially undamaged, and there was little or no evidence of sediment discharge.

Of particular note was the lack of sediment discharge from the drainage channels at the northwestern corner of Lot 196. Despite the three days of rainfall, there was no evidence of any notable discharge of sediment from this portion of the subject site (Plates 10 and 11). Nevertheless, as discussed below, supplementary works are recommended in this location to enhance the erosion control and rehabilitation of this portion of the site.

#### 4.2 Southwestern Creekline

The creekline in the retained vegetation in the southwestern part of Lot 196 is typical of many of the small permanent creeklines which occur throughout the sandstone escarpment country of the Hawkesbury region, exhibiting small pools, minor cascades and waterfalls, and overhanging riparian vegetation.

The creekline does not support a significant continual flow, although 'flood marks' up to 0.75m above the channel bottom occur in some areas, and faster flow rates are evidenced by the flattening of vegetation, and the occurrence of fallen trees forming dams across the creek. Storm events with periods of intense and relatively high rainfall are a natural phenomenon of the region, and it is likely that the majority of local creeklines would experience minor flooding from time to time, and would show similar signs of such disturbance.

An artificial retaining wall had been constructed across the creek, approximately 50m downstream of the Dixon Sands site. It appears that this wall has been in place for a considerable period of time, possibly constructed to provide a more reliable water supply for agricultural or emergency bushfire control needs.

#### **Dry Weather Survey**

The water entering the creek from the Dixon Sands site was observed to be relatively clear and free of sediment during the surveys in 1998 and early January 1999, with no foam or other gross pollutants sighted along the surveyed length of the creekline (Plate 6). The observable quality of water appears to be satisfactory, although no chemical analysis of the water was undertaken.

Evidence of extremely minor levels of natural erosion occur in the upper reaches, generally in areas on the outside of bends, and at the foot of small escarpments or waterfalls. It would appear that this erosion is restricted to periods of peak water flow, or during high rainfall storm events, and is not occurring as a general direct result of the sand extraction activities.

Deposition of small quantities of sediment is evident upstream of the artificial retaining wall, in some pools along the creek, and where vegetation and other debris has built up against large branches and fallen logs. However, the observed levels and effects of sedimentation are relatively low, and the impacts lessen with distance from the site. It is highly unlikely that any adverse impacts would currently be imposed on the lower reaches of the creekline, or on Jackson's Swamp (at its downstream limit).

It is probable that sediment discharge occurs only during high rainfall storm events, when even the most rigorous water quality and sediment control measures are likely to be overcome, and when some erosion and sedimentation would occur naturally.

Riparian vegetation adjacent to the creekline appears to be in relatively good condition, although a number of invasive weed species (including Crofton Weed Ageratina adenophora, Tall Fleabane Conyza bonariensis, Flatweed Hypochaeris radicata, Paddy's Lucerne Sida rhombifolia and Blackberry Nightshade Solanum nigrum) are present immediately upstream of the artificial retaining wall.

It would be difficult to determine the ultimate source of such weeds without a more detailed investigation, as the seeds are easily transported by wind and water, and can be carried by birds, mammals and other fauna species. It is not likely that the Dixon Sands site is the sole or even predominant source of these invasive species, and many of these species occur upslope and upstream of the site. Nevertheless, creeklines in general are more susceptible to weed-infestation when in a partially disturbed state.

A very fine particulate matter was observed on the leaves of some small groundcover herb and fern species, immediately adjacent to the creekline. The occurrence of this material decreased considerably with distance from the Dixon Sands site. Whilst the particulate matter may adversely affect individual plants upon which it has settled, the impacts are not significant with regard to vegetation in general, or to the creekline and other habitats in particular. No evidence of a lack of vigour in plants along the creekline was observed.

A previous investigation of the Dixon Sands site at Maroota had identified the creekline in the southwestern part of Lot 196 and the adjacent vegetation as being of conservation value, particularly for a population of the threatened Yellow-bellied Glider *Petaurus australis* (MKES 1992). Conservation of the area of vegetation and the creekline at this location was recommended and has occurred, as a means of protecting the natural environment and habitat for the Yellow-bellied Glider in particular. As noted above, there is little evidence of any significant adverse impacts upon the creekline, and no evidence for a decline in vigour of any of the trees or shrubs downstream of the Dixon Sands site.

#### Wet Weather Survey

The supplementary survey of the subject site on the 23rd of January 1999, following three days of heavy rain, revealed little significant or notable effect arising from the discharge of stormwater runoff from the Dixon Sands site. Whilst the water being discharged down the creekline was slightly discoloured (Plate 12), there was no evidence of significant sediment deposition within the creekline as a consequence of the rain immediately preceding the investigation. Small pools within the creek channel did, in some instances, contain a thin layer of fine sediment, but there was no evidence of substantial areas of native vegetation being affected or smothered by the sediment.

As noted above, vegetation along and immediately adjacent to the creekline provides no evidence of significant stress or damage which could be attributed to sediment discharge and deposition, or to poor water quality. It is of note that downstream of the artificial dam wall there is only limited evidence of sediment deposition, and the sand and other sediments within the small artificial dam may contribute to an improvement in water quality by acting as a sediment trap and assisting in filtering sediments and suspended solids from water discharged from the Dixon Sands site.

#### 4.3 Kunzea rupestris

A brief inspection of the individuals and stands of the threatened plant species *Kunzea rupestris*, located at the western side of Lot 29 in the southern part of the subject site, revealed no obvious adverse impacts as a result of the sand extraction activities of Dixon Sands on the subject site. Conversely, as noted below, there is some potential for adverse impacts arising from traffic in the immediate vicinity (particularly trucks using the private access road), and there has clearly been some previous loss of individual *K rupestris* as a result of the construction of that road.

Individual *K rupestris* and other native flora species were inspected on Lot 29 immediately west of the existing extraction area at the southern boundary of the Dixon Sands site. Neither any specimens of *K rupestris* nor any other native flora specimens displayed evidence of stress or a lack of vigour which could be ascribed to the extraction activities on Lot 29. Whilst there are a number of dead or partially dead plants (not *K rupestris*) in this locality, they are clearly related to events prior to the sand extraction activity, probably involving bush fire.

The existing sand extraction pit on this portion of the Dixon Sands site is not currently being actively worked, and there is a buffer of exposed natural rock between the western edge of the extraction pit and the stand of *K rupestris*. In addition to the lack of evidence for stress in the plant specimens adjacent to the extraction pit, natural regeneration of exposed soil areas is occurring around the pit, including in the area which still supports the individuals of *K rupestris* on the Dixon Sands site.

Conversely, the access road which is located on the Crown road reserve to the west and south of Lot 29 has been constructed through part of the stand of *K rupestris*, and doubtless involved the removal of individuals of this species. Continuing use of the private access road also involves the generation of dust, and shrubs in the immediate vicinity of the road had (at the time of the most recent field inspection) a fine coating of dust. Whilst no specific indicators of environmental stress were observed on vegetation near the road, a detailed investigation was not conducted, as this activity is not part of the Dixon Sands operation.

A draft strategy has been prepared for the conservation of the stand of *K rupestris* on the adjacent land (Lot 198) at Maroota (Burcher 1997). Most of the threats recognised by Burcher and the activities proposed in the draft strategy relate to the existing disturbance of this stand of *K rupestris*, which arises primarily from the presence and use of the access road along the Crown road reserve and on Lot 198. As discussed above, there is no indication that the sand extraction activities on Lot 29, being conducted by Dixon Sands, are imposing adverse impacts upon the stands of *K rupestris* in this location. As noted by Burcher (1997), "the most serious threat to the population is the potential of heavy rain to erode the haulage road and dump sediment on the population". The existing operations by Dixon Sands at Maroota have not, as noted above, adversely affected the stand or individual specimens of *K rupestris*. No further sand extraction from the southwestern part of Lot 29 is proposed.

#### 5 ENVIRONMENTAL MANAGEMENT MEASURES

As noted above, there are only limited adverse impacts arising from sediment discharge associated with the existing sand extraction activities of Dixon Sands P/L at Maroota. In general, stormwater management on the site is appropriate and successful, with the discharge of sediments from the site, including from bund walls and embankments, into adjacent bushland being limited to very small areas and one or two sites of minor impact.

In general, the operation currently appears to have involved the implementation of appropriate stormwater management, erosion control and soil management activities, and is currently imposing only limited impacts upon the natural environment, both on the subject site and adjacent to it.

In terms of native vegetation and plant species of conservation significance, the existing operations being conducted by Dixon Sands P/L do not involve the imposition of significant effects on the natural environment. In this regard:

- there is no evidence for the imposition of adverse impacts upon the stand of Kunzea rupestris located on Lot 29 as a consequence of the sand extraction activities;
- the creekline which flows through the southwestern part of Lot 196 appears in good condition, with only extremely limited evidence of sediment discharge, and no indication of adverse impacts to any significant extent upon native vegetation or plants; and
- the external embankments and bund walls of the operation display only limited past erosion and sediment deposition into adjoining vegetation, generally to a distance of less than 2 metres.

There are, however, some environmental management and impact amelioration measures which could readily be applied to further reduce adverse impacts upon adjoining native vegetation and to provide additional benefits for the natural environment in the immediate vicinity. As noted above, sediment discharge and adverse impacts upon native vegetation adjacent to the sand extraction operation are extremely limited, and the activity does not constitute "a significant effect" for any threatened biota or their habitats, nor a "significant" impact on any elements of the natural environment.

Nevertheless, additional environmental benefits for flora and fauna can readily be derived from the implementation of a number of environmental management and impact amelioration measures, including:

- upgrading of the sediment discharge channels and erosion control measures at the northwestern extremity of Lot 196, involving:
  - supplementing the hay bales and silt fences currently present in this locality;
  - the planting of native vegetation (including sedges, grasses and ground covers) to reduce the erosion rates and sediment discharge from bare embankment walls and to increase the deposition of sediment within the stormwater control structures; and
  - the use of mulching, direct planting, spray application of vegetation and/or groundcover mats to reduce sediment discharge and promote revegetation;
- minor modifications to and management of the small artificial dam in the creekline in the southwestern corner of Lot 196 (downstream of the extraction area), to improve its function as a water quality control feature. In this regard, existing sediments within the dam should be redistributed so that water discharged under low and moderate flow conditions from the Dixon Sands site percolates through the sand prior to its discharge from the bottom of the stone wall (as is currently the place). This process should assist in sediment deposition and the filtering of suspended particles in the discharge water, and further improve water quality downstream of the dam. A management program for monitoring and cleaning out of the artificial dam needs to be prepared, and implemented as part of the EMP for the Dixon Sands extraction operation;
- the addition of some topsoil in areas and on embankments which are at their completed levels, and planting of native endemic vegetation. In this regard, a combination of natural regeneration, transplanting of individuals and the use of commercially available native seed would be appropriate. In addition, the collection of seed from adjacent vegetation, its propagation and subsequent

replanting on the embankments and on the subject site should also be encouraged;

- some limited regrading of areas of steep embankment adjacent to retained native vegetation, to reduce sediment discharge and to assist in the regeneration of native vegetation; and
- consideration of the necessity for a reduction (in a few locations) of the height of bund walls and embankments, to limit the potential for sediment discharge.

With respect to the above recommendations, an Environmental Management Plan could be prepared to document the location and extent of earthworks, the species and mix of native vegetation to be used in regeneration activities, and the use of native seed and propagation measures to provide plants for replanting programs. In addition, the assistance of a local nursery should be considered, to assist in the revegetation and rehabilitation process.

#### 6 CONCLUSIONS

As detailed above, the existing operations at the Dixon Sands site at Maroota (Lots 29 and 196) do not display any evidence of the imposition of significant adverse impacts upon the natural environment in the immediate vicinity. Whilst there is some limited erosion and sediment discharge off the site, primarily from bund walls and embankments, most of the discharges into adjacent bushland are minor in extent and have occurred in the past. There is no evidence for notable or significant sediment discharges from the subject site currently or recently.

In particular, despite three days of heavy rainfall in January 1999, sediment discharge from the subject site into adjoining vegetation was extremely limited. At one location, where there had been some erosion of the outer embankments, sediment discharge occurred for up to 8m into adjacent bushland, although no significant smothering of or disturbance to native plants was evident or is regarded as likely. Elsewhere, there was little evidence of sediment discharge from the site.

The existing operations at Maroota involve an array of water management and sediment control measures which essentially confine sediment and other contaminants to the existing disturbed portion of the subject site. Whilst there will doubtless be some discharge at times of sediment laden water from the site, particularly during periods of high rainfall, the potential for adverse impacts to be imposed under these circumstances is limited by the volumes of water naturally occurring in the environment at the time. As noted in detail above, there is some limited sediment discharge from external bund walls and embankments, but in most instances the extent of disturbance or degradation of adjacent bushland is minimal or non-existent.

Similar considerations apply to the creekline in the southwestern corner of Lot 196, which displayed only limited evidence of sediment discharge and deposition following the three days of rainfall in January 1999. It is not likely that significant adverse impacts had been or will be imposed upon the natural environment as a result of the minor levels of sediment discharge observed.

Furthermore, the sand extraction operations being conducted by Dixon Sands at Maroota do not appear to be adversely affecting the threatened plant species *Kunzea rupestris* which is located on Lot 29 and adjoining lands. There is no evidence to indicate any decrease in vigour of plant specimens in the vicinity of the extraction operations, arising from the extraction activities themselves, with specimens both of *K rupestris* and of other plant species at this location demonstrating good vigour.

On the basis of the available evidence which indicates only extremely limited impacts arising from erosion and sediment discharge from the subject site, the extraction activity does not appear to be imposing any significant adverse impacts upon the natural environment. Furthermore, the current operation does not appear likely to impose "a significant effect" on any threatened biota or their habitats.

To ensure that the existing sand extraction operation continues to minimise adverse impacts upon the adjoining natural environment, and to contribute in a positive manner to conservation and environmental management in this locality, some upgrading of the environmental management measures along the periphery of the sand extraction operation are recommended (as detailed in Section 5 of this report). These are particularly intended to further reduce any potential for sediment discharge from external bund walls and embankments, and to promote the regeneration of native vegetation in the vicinity (including on the exposed walls) and enhancement of the adjacent vegetation.

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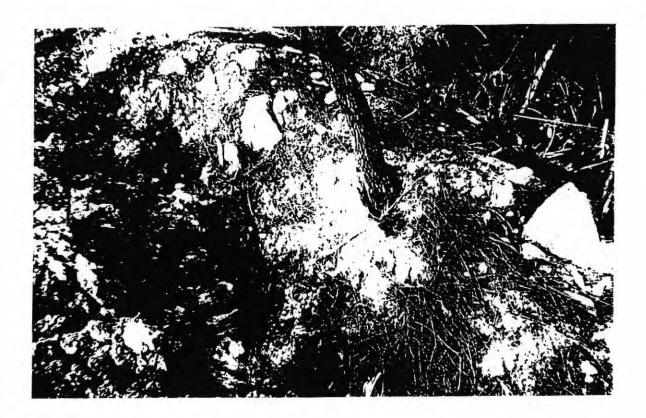


PLATE 1 Dry weather survey. Original small bund on northern side of the subject site, illustrating colonisation by native plants and a long-term surviving She-oak. The newer bund is located to the left of the photograph, and adjacent (essentially undisturbed) woodland is located in the top right corner.



PLATE 2 Dry weather survey. A more substantial portion of the bund along the northern boundary, illustrating extremely limited discharge of sediment into the adjacent bushland. There is no evidence for a reduction in plant vigour adjacent to this bund.



PLATE 3 Dry weather survey. Substantial embankment near the northeastern corner of the subject site, indicating long-term stability, natural colonisation by native plant species, and vigour of immediately adjacent vegetation (to the right). Sediment discharge from the embankment at this location is generally less than 2 metres in extent.



PLATE 4 Dry weather survey. Existing embankment near northeastern corner, indicating recolonisation of embankment and a lack of evidence for sediment discharge into adjoining bushland. There is no evidence of sediment deposition on the rock shelf in the middle right of the photograph, despite its location downslope of the embankment.



PLATE 5 Dry weather survey. Drainage channels at northeastern corner of the subject site, indicating sediment deposition in the channel, colonisation of the banks by native plants, and the use of silt fence and hay bales to trap sediment. Evidence for sediment discharge downslope of the channel is minimal, with sediment deposition occurring only in a very narrow band for approximately 10 metres (at maximum) downslope.

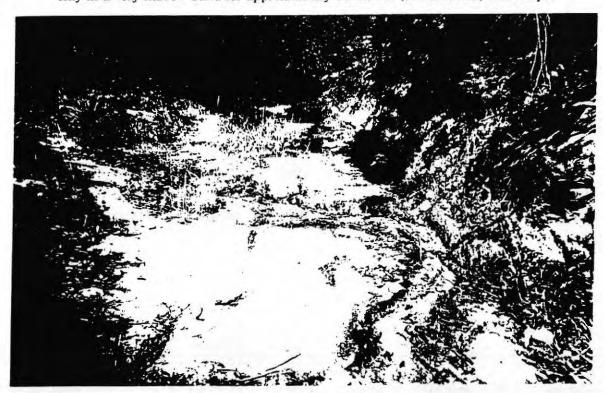


PLATE 6 Dry weather survey. Creekline in southwestern part of Lot 196, indicating minimal sediment deposition and colonisation by native and introduced plants of the channel bed. At the time of this photograph there was only a very low flow of clear water, with some long-term staining of the drainage channel.



PLATE 7 Wet weather survey. Original bund along northern boundary of subject site, indicating virtually no sediment discharge into adjoining bushland as a consequence (near Plate 1 site) of the heavy rains over a three day period.



PLATE 8 Wet weather survey. High embankment on northern boundary with adjacent bushland, indicating a lack of sediment discharge into the native vegetation following heavy rains.



PLATE 9 Wet weather survey. Native vegetation adjacent to the foot of the high embankment on the northern boundary of the subject site, at the location of the single notable site of sediment discharge following the three days of rain. Sediment is visible between grass tussocks and groundcover plants, but the extent of discharge into adjacent bushland was no more than 8m, and no plants appeared to have been smothered as a consequence.

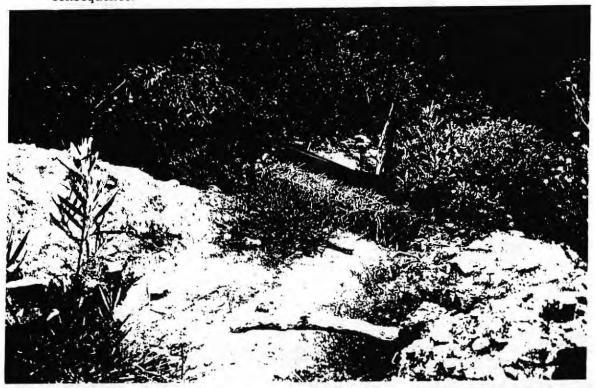


PLATE 10 Wet weather survey. Drainage channel at northeastern extremity of the subject site following three days of rain. Note that the small log in the floor of the channel had moved (see Plate 5) as a result of water ponding. The walls of the channel and adjacent embankment displayed little evidence of significant sediment discharge, and there is little additional sediment in the floor of the drainage channel.

North Maroota Operation, NSW

## Appendix C8 – Flora and Fauna Assessment – Crown Road

# APPENDIX C8: FLORA AND FAUNA ASSESSMENT - CROWN ROAD.

The access road currently utilized by PF Formation, that separates Lots 196 and 29 of the Dixon Sand quarry has been inspected to assess if any flora or fauna exist on this road. This inspection took place by Southern Environmental in on three separate days in May 1999. The road in question shows signs of frequent heavy vehicle movements with deep wheel tracks. In addition the road had been dressed with a mixture of crushed rock and cement dust. No flora or fauna were observed on this road. On all three occasions no vehicles were observed using the road despite the inspections lasting between two and three hours. At each inspection no animal tracks were observed despite the lack of vehicle movements. The edges of the road have minimal growth due to the high pH stormwater running off this road.

### Appendix C9 – Visual Amenity Assessment

- 1. INTRODUCTION
- 2. REGIONAL VISUAL ASSESSMENT
- 3. LOCAL VISUAL ASSESSMENT
- 4. CONCLUSION

Prepared by Lyall & Macoun Consulting Engineers

## VISUAL AMENITY AND SCENIC QUALITY STUDY

#### **NORTH MAROOTA SAND OPERATION**

#### Prepared for

#### **DIXON SAND (PENRITH) PTY LTD**

February 1999

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File: docs\waterman\water99.doc	Rev: 1.0	Reviewer: TWM

#### **TABLE OF CONTENTS**

1.	INT	RODUCTION1
	1.1	The Site1
	1.2	Statutory Obligations1
2.	RE	GIONAL VISUAL ASSESSMENT4
	2.1	Objectives4
	2.2	View Shed4
	2.3	Assessment of Impact4
	2.4	Proposals to Screen Site4
	2.5	Conclusions5
3.	LO	CAL VISUAL ASSESSMENT6
	3.1	Objectives6
	3.2	View Shed6
	3.3	Assessment of Impact6
	3.4	Proposals to Screen Site7
	3.5	Conclusions7
4.	SU	MMARY AND RECOMMENDATIONS8
		List of Figures
_	re 1.	•
Figu	re 1.	2 Photos of Regional Views
Figu	re 2.	1 Photos of Local Views

**Photos of Local Views** 

**Photos of Local Views** 

Local Lines of Sight

Figure 2.2

Figure 2.3

Figure 3

#### 1. INTRODUCTION

The purpose of this report is to address the possible impacts on the visual amenity and scenic quality of the area from the proposal to complete extraction and rehabilitation on Lots 196 and 29, North Maroota. The standards set by the planning agencies in respect to visual aesthetics, are in Baulkham Hills Shire Council's Development Control Plan No. 500 (DCP 500) and the Local Environmental Plan (LEP) and the requirements of the Sydney Regional Environmental Plan No. 20 (SREP 20) of the Department of Urban Affairs and Planning (DUAP).

The quarry site is visible from local residences and from publicly accessible vantage points (roads) within the local and regional areas. In this assessment, local views have been classified as views within two kilometres of the site.

#### 1.1 The Site

On a local scale, the site is situated on the western side of Old Northern Road and bordering natural bushland that is continuous to the west. It is approximately 600m from the main road and there is only one approved access point for the site. All 'local' development is to the east of the site, generally between the site and Old Northern Road.

Old Northern Road is at a higher level than the site and the land in between is used for agriculture. (The local visual access of the site is from Old Northern Road, near the junction with the Crown reserve road leading to the site and from one local residence).

The extraction site is located some 3 to 4 km from the Hawkesbury River. The topography of the river corridor is characterised by the deeply entrenched river valley, formed in the sandstone plateau. This topography has allowed native flora and fauna to form a picturesque landscape right along the section of the river, a visual landscape of significance in tourist and recreational terms.

The extraction site is also usually accessible from the north, from Old Northern Road.

#### 1.2 Statutory Obligations

#### 1.2.1 The Hawkesbury-Nepean Scenic Quality Study

This document was part of a comprehensive review of SREP No.20 conducted by DUAP in 1996. The main objectives were:

- "To identify areas of high and regional significance including both natural and cultural landscapes
- To provide a clear statement of significance for each of the identified areas."

The study was intended to make application of the SREP No.20 less ambiguous about scenic quality issues.

The Scenic Quality Study identifies that the section of the Hawkebury-Nepean River closest to the site, from Lower Portland to Wisemans Ferry to Spencer, has significant heritage aspects and recreational value. The unique structure and aesthetics of the landscape, which the site is a part of, affect both the heritage and recreational aspects of the river.

The main strategy item that is considered from this report is:

"Consider the need to retain existing vegetation, especially along riverbanks, slopes visible from the river and its banks and along the skyline, and the need to carry out new planting of trees, and shrubs, particularly locally indigenous plants."

#### 1.2.2 Hawkesbury-Nepean SREP 20 (No.2 1997)

DUAP produced the Sydney Regional Environmental Plan No. 20 to

"protect the environment of the Hawkesbury-Nepean River system by ensuring that the impacts of future land uses are considered in a regional context."

The plan provides policies and strategies. The policies and strategies must be considered when assessing a development proposal, as all proposals must comply with Part 2 of the SREP No.20. As the section of the river from Wisemans Ferry to Spencer is identified as having high scenic quality of State significance, it is necessary to consider all the requirements of SREP No.20 and not just Part 2.

The Policy for 'Riverine scenic quality' is:

"Clause 6 (7): Policy: The scenic quality of the riverine corridor must be protected."

Riverine corridor is defined as: "the river and the land marked on the map as scenic corridor." According to the SREP No.20 map, the site is within this corridor. This means the visual impact of the proposed development on the regional scenic quality must be considered.

#### 1.2.3 Baulkham Hills Shire Council LEP (1991)

The Baulkham Hills Shire Council produced the Local Environmental Plan in 1991. The aims of the LEP include:

"Clause 2 (1)(d) to facilitate and encourage development which is compatible with the environmental amenity and heritage of the Shire."

The LEP defines extractive industry as:

"the winning of extractive material or an industry or undertaking, not being a mine, which depends for its operation on the winning of extractive material from the land on which it is carried out."

The proposed development is classified as an extractive industry and needs to comply with clause 34 (Extractive Industries) in its entirety. This clause does not have any specific requirements concerning scenic quality and neither are there any Special Provisions in Part 3 of the LEP relating to visual effects.

#### 1.2.4 Baulkham Hills Shire Council DCP 500

Council adopted the Development Control Plan No.500 (Extractive Industries) on 2 December 1997, in accordance with Section 72 of EP&A Act (1979). Visual amenity and scenic quality are addressed in **Section 2.5 Visual Amenity and Scenic Quality**. The Objectives of **Section 2.5** are:

- "To conserve the scenic and landscape quality and diversity of the Shire
- To conserve the aesthetic, visual, cultural, scientific, historic, social, or other special values of the Baulkham Hills Shire landscape; and
- To retain the natural and rural/ residential character of the Shire."

The Performance Criteria in Section 2.5, includes:

- "Extraction operations should provide setbacks capable of minimising the visual impact of extraction sites particularly when viewed from surrounding private and public places." (emphasis added)
- "Extraction operations should: protect the surrounding natural and/or rural landscape and minimise the sources of visual and other environmental pollution."

There are a series of Prescriptive Measures, and the key ones are:

- "Proponents should submit with their application a Landscape Site Analysis which identifies and assesses the scenic qualities, landscape constraints and options for landscape protection of the proposed extraction site;
- Machinery and equipment associated with extraction should be stored in buildings and structures
  of non-reflective materials and of a height, bulk and scale proportional with the surrounding
  landscapes;
- Extraction sites are to be rehabilitated to a final landform compatible with the shape, grade, level, form, land use, landscape quality and bio-diversity of the surrounding terrain."

Section 2.16 Maroota, lists one of the objectives as:

"To protect and maintain the safety and amenity of the Maroota Public School and residences not associated with extraction."

#### 2. REGIONAL VISUAL ASSESSMENT

#### 2.1 Objectives

One of the objectives of this study is to assess the current impact upon the region's scenic quality. 'Regional' is defined in this report as beyond 2 km from the site. DCP 500 and the SREP No.20 are the two key standards.

#### 2.2 View Shed

A small section of the river can be viewed from the highest point of the site, in the north west corner of Lot 196, and as shown in the photo in **Figure 1.1**. The viewing distance is 3 km approximately. Thus it can be assumed that the public viewing points and private residences on this section of the river, can view a very small section of the cleared area of white sand, on their horizon.

The other regional location that can see into the site is to the north. Old Northern Road follows the ridge as it continues north, with houses located on the western side. A section of the road north of the site changes direction to become oriented in an east to west direction and it is higher than the land which separates it from the site. This leaves a visual access to the site from the road, as can be seen in **Figure 1.2**. Some of these residences can be seen from the highest point of the site and will therefore have a view of the site. The area of the site visible from this vantage point is the north-west corner of the site and much of the northern edge of Lot 196. The viewing distance is about 2.5 km. The elevation is very similar to the site.

#### 2.3 Assessment of Impact

The section of the riverbank affected is far enough away from the site that the impact on the scenic quality of the view is minimal. The view is also a very limited one. With further excavation, this higher part of the site will be lowered sufficiently to eliminate the site completely from the river's view. The adjacent land has dense vegetation. It is currently a proposed Nature Reserve, ensuring that the present vegetation remains.

The view of the site from the Old Northern Road regional vantage point to the north is of the excavation faces in the north west corner of the site. This can be considered an intrusion on the visual amenity as all the landscape surrounding the site is vegetation. The impact will not be completely removed within the first few years of extraction, although it will be softened by the rehabilitation taking place in the centre of Lot 196. (It is noted that there are many other extractive areas visible along Old Northern Road through Maroota). The objective, however, in line with the DCP must be to screen or at least limit all views.

#### 2.4 Proposals to Screen Site

Excavation of the elevated sections of the site and perimeter screen planting along the northern and north western edge of Lot 196 would reduce the impact of the site on the regional visual amenity to an acceptable level. The priority will be to carry out the perimeter screen planting to a level of density

to screen out the visual access. The extent of the screen planting will need to be along half of the northern boundary of Lot 196 (west).

#### 2.5 Conclusions

There are presently two regional locations whose visual quality is affected by the site - the riverbank to the north west and a section along Old Northern Road, to the north. The intrusiveness and extent of the view from the riverbank is minimal and can be considered negligible given the distances involved. The vantage point along Old Northern Road is more significant and needs appropriate action to be taken. Improved setback vegetation will ameliorate the affect.

#### 3. LOCAL VISUAL ASSESSMENT

#### 3.1 Objectives

The other objective of this study is to assess the level impact on the local region's scenic quality and as necessary, determine appropriate mitigation concerns. A DCP 500 policy is to conserve the scenic quality of the Shire using certain prescriptive measures to fulfill the performance criteria given in Section 2.5 of DCP 500. (It is noted DCP 500 is relevant to both local and regional views):

"Extraction operations should provide setbacks capable of minimising the visual impact of extraction sites particularly when viewed from surrounding private and public places."

This section analysis local or views within 2 km of the site.

#### 3.2 View Shed

The present impact of the site on local scenic quality is analysed in photos in **Figures 2.1** to **2.3** inclusive. The lines of sight from a range of possible vantage points are shown in **Figure 3**.

#### 3.3 Assessment of Impact

All possible viewing locations from residences and Old Northern Road within the local region were investigated. The following sites were chosen and the assessment of visual access from each is set out below:

<u>Vantage point (1)</u> (residence) has a clear line of site into the site from the site entrance to the office area including the various operating areas of the Lot 196 site. The location is approximately 20 m higher than the site.

<u>Vantage point (2)</u> (roadside) is a public viewpoint. The location has a view of all east-facing extraction faces in Lot 196. Approximately 200 m, of this road can gain views of the site. Again the level is at or over 200 m AHD, some 20 m higher than Lot 196 surface level.

Vantage point (3) and (4) (residences) have their views shielded by the dense vegetation on Lots 117 and 1.

<u>Vantage point (5)</u> is the school. Any possible visual access is completely screened by continuous vegetation the full length of Lot 2.

<u>Vantage point (6)</u> is a residence on the eastern side of Old Northern Road. There is agriculture and natural vegetation completely shielding the view of the site, even though the top of the foothills surrounding the Hawkesbury-Nepean River can be seen on a clear day.

<u>Vantage point (7)</u> (residence) is located near a large hydroponics shed. There is no view of the site from this location.

Vantage point (8) (roadside) is at the junction of Old Northern Road and Wisemans Ferry Road. There is no view of the site from this vantage point.

The only viewing locations with visual access to the site are points (1) and (2). There is a need to consider proposals that will ameliorate the visual amenity impacts from these vantage points.

#### 3.4 Proposals to Screen Site

The DCP 500 lists prescriptive measures in Section 2.5:

"Perimeter screen planting known to achieve sufficient height capable of softening the exposure of extraction sites when viewed from surrounding private and public places should be provided at all times."

Screen/vegetation plantings should be undertaken along the full length of the access road to the site office area either on the bund separating the access road from operational areas or along the eastern boundary of Lot 196. Such plantings should be undertaken immediately and although such plantings will not eliminate the visual access completely it will soften the impact of the site upon the scenic quality from points (1) and (2).

An alternative strategy would be to carry out plantings along the western side of the Old Northern Road road easement and on Lot 1 (Vantage point 1). Approvals would be required for such action from the respective landowners.

#### 3.5 Conclusions

Only two vantage points in close vicinity of the entrance to the site are effected by the extraction site. The problem is readily ameliorated even if it cannot be fully resolved. Other intrusive visual access problems to other sites cannot be solved.

#### 4. SUMMARY AND RECOMMENDATIONS

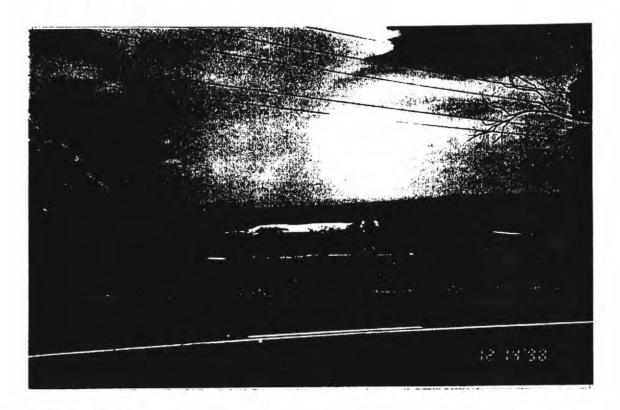
The impact of the quarry site on the visual quality of the region and local area surrounding the quarry is limited to only three (3) locations. Regionally, there are views from an area along the Hawkesbury River and from Old Northern Road to the north. Locally, the vantage points with affected visual amenity due to the site, are located in the close vicinity of the entrance to the site.

The proposed development contained in the EIS would not increase the level of visual access from any local or regional location.

All actions recommended in this report are within the requirements of the State and local planning instruments and in particular DCP 500 and SREP No.20. These instruments have policies and recommendations for improving the scenic quality of the area, all of which have been considered in this report.

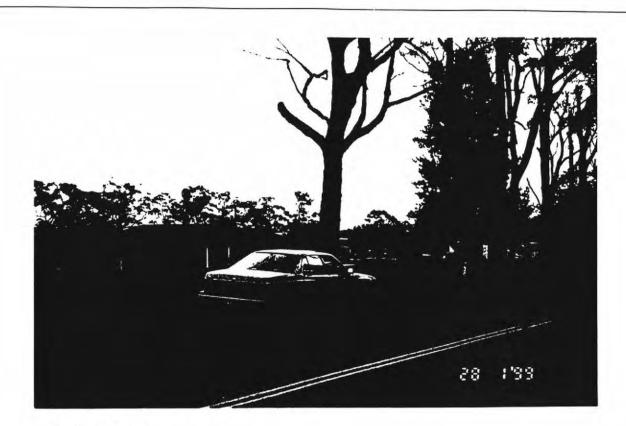


Vantage Point 1



Vantage Point 2

Figure 3.1 PHOTOS OF LINE OF SIGHT

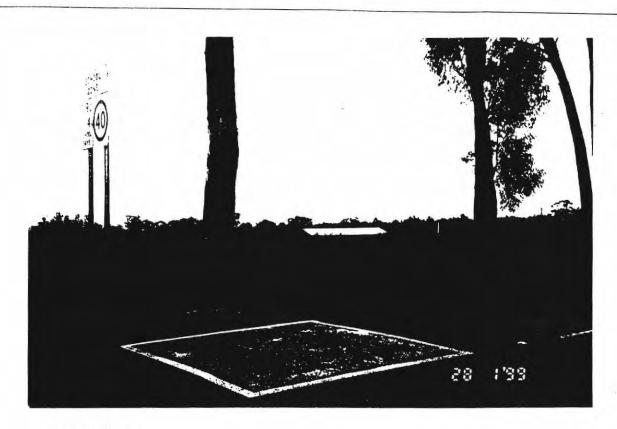


Vantage Point 3

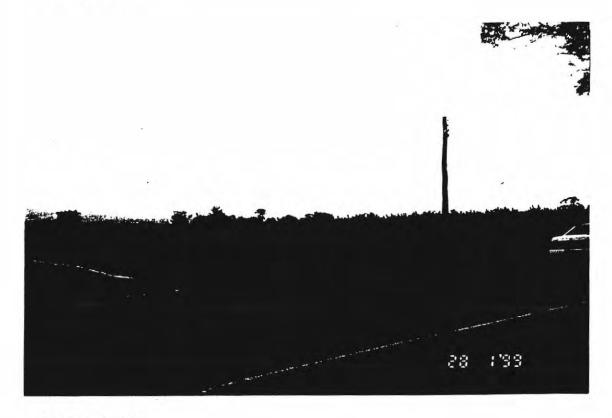


Vantage Point 4

Figure 3.2 PHOTOS OF LINE OF SIGHT



Vantage Point 5



Vantage Point 6

Figure 3.3 PHOTOS OF LINE OF SIGHT



View from site - Old Northern Road



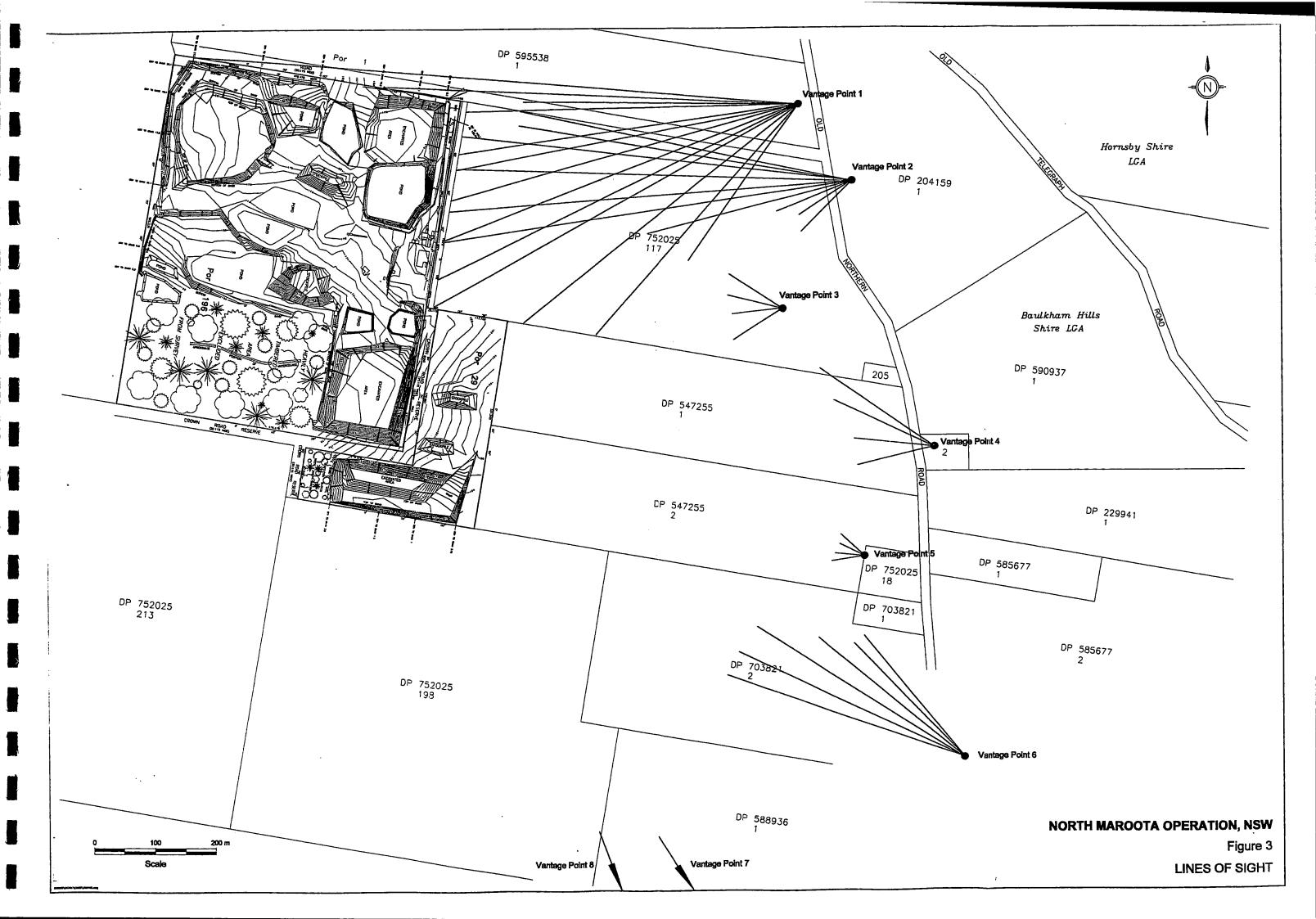
View from site - Hawkesbury River



View from Old Northern Road



View from Old Northern Road



# Appendix C10 – DRAFT ENVIRONMENTAL MANAGEMENT PLAN

#### 1. INTRODUCTION

This report looks at the scope, content and structure of the future EMP.

The future EMP is specified under draft Consent Condition No 6.5. The content required for the EMP is set out.

This report commentates the full range of statutory obligations that will be imposed as part of this consent, which in addition to the consent under the "Environmental Planning and Assessment Act, 1979" (an amended) is also likely to include all licences and approvals including:

- licence and pollution control approval (under Pollution Control Act, 1970) and encompassing air and noise issues (as a prescribed site) and discharge licence
- consent for works on a public road (under the Roads Act 1993)
- possible licence (under Water Act 1912)

Each of the licences and approvals will specify various requirements as an integral part of the currency of the approval.

All conditions and requirements of all approvals will be compiled into the Environmental Management Plan.

# 2. EXISTING ENVIRONMENTAL MANAGEMENT PLANNING

The Manual of site Environmental Management Requirements (Dixon Sand, 1998) was issued on 3<sup>rd</sup> December 1998. With the order of the Court on 18 December 1998, this manual is no longer current. It was based on the requirements of the Consent 92/591 and the general environmental due diligence responsibilities of the operator.

It was prepared to provide environmental management requirements for an extension of the consent, (which Council refused and as a consequence that consent has now lapsed)

#### 3. SCOPE AND CONTENT OF NEW OPERATION EMP

The new EMP can only be prepared once all the consent approvals and licences have been issued. However the requirements of the new consent etc are largely known. The existing EPA licence, for example, will provide the basis for the new licence. DCP 500 provides a Sample – Notice of Development Consent, in Attachment 5. The previous manual contains the QA procedures, Environmental Policy and many of the Standing Site Instructions, applicable to this operation, both in the past, and it continuance.

The following attachments are provided

Attachment 1

- Table of Contents

Manual of Site Environmental Requirements

Attachment 2

- Commentary on Draft Conditions of Development Consent

# 4. CONCLUSION

An EMP will be required as a Consent Condition. Due diligence in NSW requires procedure management of environmental responsibilities.

This report has outlined the frame, content and structure outlines for the future EMP.

# **ATTACHMENT 1**

# DIXON SANDS (PENRITH) PTY LTD

# MAROOTA QUARRY - PORTIONS 196/29, OLD NORTHERN ROAD, NORTH MAROOTA, NSW

Manual of Site Environmental Management Requirements

Copy No. 2

**Lyall & Macoun Consulting Engineers** 

### **DIXON SANDS (PENRITH) PTY LTD**

### MAROOTA QUARRY – PORTIONS 196/29, NORTH MAROOTA

#### MANUAL OF SITE ENVIRONMENTAL MANAGEMENT REQUIREMENTS

December 1998 (1st Edition)

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Date: 3 December 1998
Rev No.: 2.0

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Reviewer:

#### TABLE OF CONTENTS

	Pag	e No.
	FLYSHEET	1
	TABLE OF CONTENTS	2
1.	CONTENTS OF ENVIRONMENTAL REQUIREMENTS MANUAL	3
2.	USE AND RESTRICTIONS ON USE OF ENVIRONMENTAL REQUIREMENTS MANUA	\L 4
3.	ENVIRONMENTAL POLICY	5
4.	STANDING SITE INSTRUCTIONS	6
5.	RESPONSIBILITIES OF EMPLOYEES AND CONTRACTORS TO PROTECT THE ENVIRONMENT	7
6.	ROUTINE INSPECTION REQUIREMENTS	8
7.	ANNUAL ENVIRONMENTAL COMPLIANCE AUDIT	9
8.	COMPLAINTS REGISTER	10
9.	ISSUE OF ENVIRONMENTAL REQUIREMENTS MANUAL	11
10.	AMENDMENTS TO ENVIRONMENTAL REQUIREMENTS MANUAL	12

#### **ATTACHMENTS**

- A. DEVELOPMENT CONSENT NO. 92/591
- B. STANDING SITE INSTRUCTIONS
- C. ROUTINE INSPECTION FORMS
- D. COMPLAINTS REGISTER/VISITORS BOOK
- E. NOTICES 1. "Notice to all Carriers"
- F. SITE LAYOUT PLAN

#### CONTENTS OF ENVIRONMENTAL REQUIREMENTS MANUAL

This manual addresses the following:

- "INTRODUCTORY" matters (blue)
  - 1. Contents of Environmental Requirements Manual
  - 2. Use and Restrictions on Use of Environmental Requirements Manual
  - 3. Environmental Policy
- "ENVIRONMENTAL REQUIREMENTS" matters (green)
  - 4. Standing Site Instructions
  - 5. Responsibilities of Employees and Contractors to Protect the Environment
  - 6. Routine Inspection Requirements
  - 7. Annual Environmental Compliance Audit
  - 8. Complaints Register
- "DOCUMENTS CONTROL" matters (yellow)
  - 9. Issue of Environmental Requirements Manual
  - 10. Amendments to Environmental Requirements Manual

#### USE AND RESTRICTIONS ON USE OF ENVIRONMENTAL REQUIREMENTS MANUAL

- > This manual has been prepared to ensure the ongoing compliance of the operations of Dixon Sand (Penrith) Pty Ltd at the North Maroota site (Portions 196/29) with the statutory requirements of the existing development consent, licences and other relevant NSW environmental planning and control legislation.
- > This manual is issued under the authority of Dixon Sand (Penrith) Pty Ltd. It has been prepared by Lyall & Macoun Consulting Engineers (LMCE), Chatswood NSW and is issued by LMCE.
- > The manual is a controlled document, and is subject to the requirements for use and restrictions on use, as set out in this document.
- > The manual is subject to copyright. It cannot be photocopied except with the written permission of Lyall & Macoun Consulting Engineers
- > The purpose of the manual is to set down the rules of operation of the North Maroota Sand Quarry that are necessary to meet the environmental performance standards of the operation. The manual binds the company, the company's employees and the company's contractors working at the North Maroota operations, on Portions 196 and 29 only. (The manual may be extended to include other Dixon operations at other sites, at some future time).
- > The manual will be updated, as necessary. It will only be issued to authorised persons. Upon the issue of an updated version, all superseded documents will be recalled to ensure that only current documents are in circulation. For minor edits, single amended pages could be issued and it will be the responsibility of the authorised holder of a copy of the manual to ensure revised pages are inserted into the manual to replace superseded pages.
- > This manual is a restricted document, limited to the use of Dixon Sand (Penrith) Pty Ltd and to those authorised persons listed in Table 1 of this document. It is not to be copied or circulated to any third party without the written approval of Lyall & Macoun Consulting Engineers
- > Any employee of, or contractor to, Dixon Sand (Penrith) Pty Ltd at the North Maroota operation, not abiding by the requirements of this document, will be subject to disciplinary action.

#### 3. ENVIRONMENTAL POLICY

- > This is the environmental policy of Dixon Sand (Penrith) Pty Ltd for the sand quarrying and sand processing operation carried out on Portions 196/29 and known as the North Maroota operation.
- > The Environmental Policy set out below is the basis for the standards contained in this requirements manual:

This is the Environmental Policy of Dixon Sand (Penrith) Pty Ltd for the operation of sand extraction and processing on Portion 196 and Portion 29, described as the North Maroota operation. All employees and contractors are bound to observe this policy and the rules and requirements promulgated under this policy.

Dixon Sand commits to meet all requirements of statutory consents, approvals, licences, etc. issued to the company and relating to the operations on the subject site.

Dixon Sand commits to comply with all general and specific requirements of NSW environmental law covering pollution control law, health and safety law and environmental planning law generally.

Dixon Sand commits to meet the reasonable requirements of Baulkham Hills Shire Council and to work with Council officers in the furtherance of environmental standards on the site and the development of regional planning strategies for the long term benefit of the Maroota area and the citizens of the Maroota community.

Dixon Sand commits to communicate with local community groups and do so in an open and frank manner, in order to facilitate harmonious relationships between the parties, and achieve an environmentally responsible outcome.

Dixon Sand is committed to the development of long term sand extraction and processing operations within the Maroota area. Dixon Sand is equally committed to carrying out those operations in an environmentally responsible and sustainable manner in keeping with the objectives of the SREP No. 9.

Signed on behalf of Dixon Sand:

Date.

. . .

#### 4. STANDING SITE INSTRUCTIONS

- > Standing Site Instructions (SSI) are Issued in order to set environmental practice standards for the North Maroota operation of Dixon Sand (Penrith) Pty Ltd. Copies of current SSIs are included in Attachment B.
- > SSIs are subject to the control provisions of this manual. They can be amended as necessary, again subject to the provisions of this manual.
- > It is the responsibility of all employees and contractors to comply with all SSIs. Failure to comply with an SSI will result in a breach of the company Environmental Policy and could result in a breach of a statutory consent or licence, which is an offence and potentially prosecutable under NSW law.
- Failure to comply with the requirements of SSIs could result in the prosecution of the directors of the company, the land owner, the company's management personnel and individual employees involved in causing or allowing that breach to occur. Under NSW law, such breaches can result in fines of up to \$1,000,000 for a company and for an individual, \$250,000, or 7 years imprisonment or both.
- > There is a duty to notify the EPA of any pollution incident. Should a breach of an SSI occur, it is the responsibility of employees and contractors to immediately advise company management. Further details are provided in Section 5.
- It is the responsibility of all employees and contractors to be aware of the requirements of SSIs. They will be prominently displayed at the site and routine training sessions will brief all employees on their requirements. They will also form part of all contract documentation for work at the North Maroota operation.
- > The form of a Standing Site Instruction will be as follows:

DIXON SANDS (PENRITH) PTY LTD - NORTH MAROOTA OPERATIONS
STANDING SITE INSTRUCTION NO
TITLE:
Short Description and Purpose of SSI
-
Detailed Requirements
· ·
Consequences of Non Compliance
:
Issued by: Signed by: Date:

# 5. RESPONSIBILITIES OF EMPLOYEES AND CONTRACTORS TO PROTECT THE ENVIRONMENT

- > It is the responsibility of every employee and contractor of Dixon Sand (Penrith) Pty Ltd, working on the site, to:
  - be aware of all of the requirements of this manual.
  - not deliberately or inadvertently, cause or let happen anything that may cause harm to the environment.
  - report to company management any incident or accident that potentially could cause harm to the environment.
- > Any incident or accident which could cause environmental harm runs the risk of prosecution under NSW pollution control law, and can cause damage to the reputation of Dixon Sand, as an environmentally responsible operator. A reputation for responsible environmental management requires the support of all of the workforce.
- > All Dixon employees and contractor's employees are bound by the requirements of this manual, whilst physically on the North Maroota site. An action by any person employed by or contracted by Dixon Sand (Penrith) Pty Ltd, which results in a breach of their requirements of this manual, is potentially prosecutable as having caused environmental harm. Any such action will also be considered a breach of employment conditions and/or conditions of contract.
- > Harm to the environment could be caused by, for example:
  - any dirty water leaving the site.
  - any excessive noise at the site boundary.
  - any disturbance to any species of indigenous plant, or any animal in areas adjacent to the site.
  - any spill of any fuel, lubricant, chemical, etc. or any liquid matter which could flow from the site or seep into the land surface.
  - Any failure of any embankment causing sudden release of water, clean or dirty, to leave the site
  - Any discharge of dust from the site.
  - Any truck leaving the site without proper coverage of the truck's contents.
- This list should not be considered complete. The matters are by way of example
- > All employees and contractors should be aware of the conditions of consent, the conditions of licences and all relevant matters of compliance with instruments, and act with appropriate and responsible behaviour.

#### 6. ROUTINE INSPECTION REQUIREMENTS

- > The basis of environmental management for this operation requires:
  - Specific rules/requirements by which the operation is carried out.
  - Regular inspections of operations to check the standard of operations and any problems that may be occurring.
  - Unscheduled inspections at least once per year of all facets of the operation by an an external consultant.
  - If, following routine and special inspections, there are breaches or inefficiencies identified, then this Requirements Manual should be modified.

This section addresses item 2 above.

- > Routine and documented inspections should be carried out at least monthly and, in addition, following any period of excessive rainfall. In addition, site managers should be constantly checking on operations.
- > Documented inspection records are required for a number of reasons:
  - To demonstrate due diligence in the event of any serious incident or accident.
  - To permit different people to carry out the inspection; this spreads the responsibility, should ensure it is always performed, and provides involvement of all of the site managers.
  - To provide a record of performance (or non performance) for ongoing management and future planning.
- > The routine inspection form must be completed by management on a regular basis and must be kept on a dedicated file attached to the master copy of the manual. They will be reviewed and assessed on a six monthly basis, at or about the time of Council's extractive industries report.
- > Routine inspection reports are to include:
  - Summary of sand extraction over the month, identifying active working areas.
  - Any new plant changes.
  - Rehabilitation works carried out in the period.
  - Water management report identifying site discharges, control releases, levels and quantities in all water storages, any scour or erosion problems, results of water quality monitoring, etc.
  - Air pollution control dust gauge results for the previous month, level of water use over the period for dust control on roads, any dust problems.
  - Noise control a general statement on the level of site noise, any changes in site noise sources, any complaints on site noise, etc.
  - Workshop area any spills of any liquid, any drums not bunded, any new dangerous goods imported to site, any poor practice evident, etc.
- > Attachment C provides the standard routine inspection form.

#### ANNUAL ENVIRONMENTAL COMPLIANCE AUDIT

- Under the terms of the EPA licence and the requirements of DCP 500, annual reports/certificates/plans etc. are required to record operational performance over the previous year. Specifically, annual reporting is be required for:
  - EPA licence (Licence No. 0033916).
  - Council development consent (Development Consent No. 92/591)

The EPA licence requires monitoring under the terms of the licence and a Certificate of Compliance that all monitoring requirements have been met and all information is correct. The Certificate also requires a statement as to compliance with the conditions of the licence.

- > The future development consent will also require the following annual reviews:
  - Air quality report
  - Water management plan
  - Rehabilitation management plan
  - Social impact management plan
  - Environmental management plan
  - Statement of environmental compliance with approved EIS documentation, conditions of this consent and the objective of Council's DCP No. 500.

These reviews are required to be submitted every 12 months of the operating life under the consent.

> The annual environmental compliance audit required under this section of the manual is principally for the purpose of providing the basis for the various compliance certificates and meeting the environmental terms of the licences and consent. The audit shall be carried out by an auditor with the necessary experience in the preparation of compliance audits and the experience and background in the environmental planning of extractive industries. The audit shall be prepared at a time to suit the timing of the above annual submissions.

#### 8. COMPLAINTS REGISTER

> The EPA licence, under Clause 5 of the licence, requires a record to be kept of all pollution complaints. In addition, all other complaints and reported breaches of consent are to be registered, in the complaints register. This includes correspondence from Council and other statutory authorities, and shall apply to all consents, approvals and licences.

#### The register shall record

- the date, time and method by which each complaint was lodged.
- any personal details of the complainant.
- details of the complaint.
- the action taken, including the follow up contact with the complainant.
- In the event of reported breaches of consent, evidence is to be established by contact with the authority concerned, as to the details of the reported breach, including date, time, detail, etc. for entry into the register.
- Under the EPA licence, document control requires the record of each complaint to be kept for at least two years after the complaint was received and it must be able to be produced for any officer of the EPA who asks to see them.
- The form of the Complaints Register is included in Attachment D.

#### ISSUE OF ENVIRONMENTAL REQUIREMENTS MANUAL

- The manual has been issued to the persons listed in Table 1 below. All persons to whom the manual is issued are bound under a confidentiality requirement not to provide the manual to any third party, except with the permission of Dixon Sand (Penrith) Pty Ltd or Lyall & Macoun Consulting Engineers.
- > It is the responsibility of those persons to whom this manual is issued:
  - To safeguard and have available the manual as and when required, and
  - to maintain the currency of the manual by inclusion of inserts and amendments, as and when issued.
- > Copies of the manual can be issued to additional persons/ organisations, on the basis of need and relevance, (requests to LMCE).

TABLE 1
DOCUMENT REGISTER

Document No.	Issued To	Company/ Organisation	Address	Date Issued	Date Withdrawn
1	T. MACOUN	LMCE	CHATSWOOD	15.12.98	
2	D. DIXON	DIXON SANDS	PENRITH	15.12.98	
3	D. Gouskos	MANALDO	MAROOTA	16.12.98	
4	P. ZADEIAV	BAULKHAM HILLS S.C.	CASTLE HILL	16.12.98	
5	T. GILBERT	EPA	BANKSTOWN	16.12.98	
6					
7					
8					
9					
10					

#### 10. AMENDMENTS TO ENVIRONMENTAL REQUIREMENTS MANUAL

- > This document is a controlled document issued under the document control rules set down in this manual.
- > Document control requires:
  - control of the issue of the manual only to designated and authorised persons.
  - restriction on the use of the manual only to authorised persons.
  - provision for updating the manual as necessary, and the issue of updated text only to those authorised persons.
- > Table 2 below records all amendments made to the manual. When amendments are made, either the complete manual will be re-issued and the previous manual withdrawn, or new pages will be issued. It is the responsibility of the authorised holder of the manual to return a superseded version or to replace superseded pages with the issued pages when so notified.

TABLE 2
DOCUMENT AMENDMENT REGISTER

Amendment No.	Date of issue	Page No.	Details and Reasons for Amendment
1			
2			
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15	······································		

# ATTACHMENT A

# DEVELOPMENT CONSENT NO.

# Baulkham Hills Shire Council

Administration Centre, 129 Showground Road, Castle Hill, N.S.W., 2154 Telephone (02) 634 0111

OX 8455 Castle Hill Fax (02) 899 1346 Office Hours 3.30am - 4.30pm

5th November, 1993





P 00152 CNCLREItem. 1 APP. NO. D92/591



Mr James Gouskos Manaldo Pty Ltd 339 Livingston Road MARRICKVILLE NSW 2204

Dear Sir

## ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979 - NOTICE TO APPLICANT OF DETERMINATION OF A DEVELOPMENT APPLICATION

Pursuant to Section 92 of the Environmental Planning and Assessment Act, 1979, notice is hereby given of the determination by Baulkham Hills Council of the Development Application referred to herein.

The Application has been determined by the granting of Consent subject to the conditions referred to in this Notice.

The conditions of the Consent referred to herein are deemed necessary by Baulkham Hills Council, pursuant to Part 4, Division 1 of the Environmental Planning and Assessment Act, 1979.

This Consent shall become effective 28 days after the endorsed date of consent pursuant to Section 93(1)(b) of the Environmental Planning and Assessment Act, 1979.

This Consent shall lapse unless development, the subject of the Consent, is commenced within five (5) years from the endorsed date of Consent or as otherwise provided under Section 99 of the Environmental Planning and Assessment Act, 1979 (as amended) which may vary the above date of the lapsing of the Consent.

This Consent does not relieve the developer of the obligation to obtain further approvals with reference to Building and/or Health Regulations or any other Acts.

Section 97 of the Environmental Planning and Assessment Act, 1979 confers on the applicant who is dissatisfied with the determination of a consent authority, a right of appeal to the Land and Environment Court exercisable within twelve (12) months after receipt of this Notice.



APPLICANT: Manaldo Pty Ltd

OWNER: Mr J Gouskos

PROPERTY: Portion 196 and Portion 29 Old Northern Road,

Maroota

DEVELOPMENT: Proposed Extractive Industry - Sand Mining

ENDORSED DATE OF CONSENT: 3rd November, 1993

#### Conditions of Consent

1. Temporary vehicular access directly to Old Northern Road be permitted subject to any requirements of the Roads and Traffic Authority and Council until such time as access may be obtained along the haul road as defined in DCP 108.

- 2. The applicant grant to Council a right of way on terms and conditions as determined by Council for the benefit of extractive industry traffic over its land on portions 196 and 29 as shown in DCP 108.
- 3. A building application being submitted to Council for approval for any structure proposed to be erected.
- 4. The applicant will make arrangements with Council's Extractive Industries Officer within six (6) months of the consent becoming effective, for the monitoring of all conditions of consent and for the monitoring of environmental damage mitigation practices identified in the Environmental Impact Statement.
- 5. The applicant will lodge with Council a statement within six (6) months of the consent becoming effective of the manner in which all conditions of consent have been complied with.
- 6. Consent for the purpose of extraction of material is limited to a period of five (5 ) years from .
- 7. Arrangements satisfactory to Council's Extractive Industries Officer are to be made for dust suppression from topsoil stockpiles until such time as vegetative consolidation takes effect.
- Care is to be taken to ensure that all natural bushland directly adjoining the extraction site is not damaged.
- The applicant is to monitor dust generation from the extractive operations and associated activities. If a dust nuisance is identified, then the applicant is to immediately inform Council's Extractive Industries Officer and implement any mitigation practice required by the Extractive Industries Officer.

- 10. The applicant shall lodge with Council suitable bonds to cover the cost of rehabilitation. In this regard, the amount of the bond is based on \$2.00 per square metre for the area of extraction. The bond amount shall be determined by Council upon submission of staged extraction proposals and in any case prior to the commencement of extractive activities.
- 11. The proposal is to be conducted in such a manner so that the amenity of the adjoining and nearby residents is not adversely affected.
- 12. Any proposal to alter the vehicle ingress/egress arrangements is to be subject to a separate application to Council.
- The area of land disturbed for the purpose of extraction shall not exceed the area as detailed in the Environmental Impact Statement accompanying the application.
- 14. The volume of material to be extracted shall be limited in accordance with the details provided in the Environmental Impact Statement and accompanying documents.
- 15. The depth of proposed extraction shall be limited to 15.24 metres A.H.D.
- Prior to leaving the site, all loaded trucks must have their pay-loads fully covered by a suitable material to prevent spillage from the trucks onto the roads.
- 17. The maximum number of laden truck movements is not to exceed 40 per day.
- 18. Operations involving extraction, transportation and processing or running of machinery for maintenance purposes shall not take place on the land except between 7.00 AM and 6.00 PM, Monday to Friday and 7.00 AM to 1.00 PM Saturday, and at no time on Sundays and Public Holidays. The applicant shall ensure that its drivers and clients do not arrive at the site prior to 6.45 AM on any day. In this regard, the hours of operations are to be carried out in accordance with the requirements of the State pollution Control Act, 1975.
- 19. The applicant is required to obtain a Licence to operate under the State Environmental Control Commission Act.
- 20. The applicant is required to make application under Section 17 of the State Pollution Control Commission Act.
- 21. Compliance with the provisions of the Noise Control Act (1975); particularly the attainment of a licence pursuant to Section 27.

- 22. The applicant shall pay or procure payment to the Council of a contribution under Section 94 of the Environmental planning and Assessment Act (1979) at the rate of fifty seven cents (57¢) per tonne of all processed material transported from the subject site, and in respect of the said contribution, the following provisions shall apply:-
  - (i) The said contribution will be calculated and paid monthly from the date on which and within development consent became effective.
  - (ii) The said contribution will be indexed and adjusted annually as from the date the consent became effective, in accordance with the Consumer Price Index applicable to each year ending 30th June, commencing 1st July, 1993 for the duration of the within development consent and the said adjustment to the contribution shall take effect from and including July each year, commencing 30th June 1993 for the duration of the consent.
  - (iii)On or before the fourteenth day of each month of the duration of the consent, the applicant shall deliver or procure delivery to the Council of true certified copy of weighbridge or other returns or records showing the true quantities of extracted material transported from the property during the immediately preceding month, together with the payment of the contribution calculated in accordance with this clause.
  - (iv) The Council has the right to inspect and have the original records relating to any of the extracted material, including numbers and types of laden trucks, trailers and load quantities transported from the property audited by any person nominated by its internal accountant any time when he may, by written request so require.
  - (v) The Council will pay all of the said contribution payments into a specially identified account for payment towards the rehabilitation, restoration, repair and/or maintenance of Old Northern Road between New Line Road and the Crown reserve road located immediately adjacent to the northern boundary of Portion 117, and Wisemans Ferry Road, between its intersection with Old Northern Road and the Baulkham Hills Local Government Area boundary at Cattai Creek and other projects identified in the Plan of Management for Extractive Industries adopted by Council.
  - 23. The development is to be carried out in accordance with details submitted with the application and accompany E.I.S. and additional information. ../5

Pursuant to Section 92(2)(a) of the Environmental Planning and Assessment Act, the reasons for the conditions imposed on this application are as follows:-

1. To facilitate the orderly implementation of the objects of the Environmental Planning and Assessment Act, 1979 and the aims and objectives of Council's Planning instrument.

2. To ensure that the local amenity is maintained and is not adversely affected, and that adequate safeguards are

incorporated into the development.

3. To ensure the development does not hinder the proper and orderly development of the subject land and its surrounds.

4. To ensure the relevant heads of consideration under

Section 90 of the Act are maintained.

Should you require further information please contact Mr Andrew Steers on 634 0111 between 8.30am - 10.00am.

Yours faithfully



Graham Brown
DIRECTOR - ENVIRONMENTAL SERVICES

AM/kb:DOC468/BUSPAPER/CNCL

### ATTACHMENT B

# STANDING SITE INSTRUCTIONS

No.	Title	Issued	Amendment
1	Induction of Site Workforce	16.12.98	
2	Responses to Environmental Accidents	16.12.98	
3	Access to the Site 16.12.98		
4	Construction of Structures Not yet issued		
5	Working Areas	Not yet issued	
6	Working Hours	16.12.98	
7	Covering Payloads	16.12.98	
8	Noise Control	16.12.98	
9	Control of Dust	16.12.98	•
10	Off-Site Water Discharges	16.12.98	
11	Vegetation Conservation	16.12.98	
12	Tailings Ponds	16.12.98	

#### DIXON SANDS (PENRITH) PTY LTD - NORTH MAROOTA OPERATIONS

STANDING SITE INSTRUCTION NO:

1

TITLE:

INDUCTION OF SITE WORKFORCE

#### Short Description and Purpose of SSI

All site employees are responsible for their actions on-site. They are required to comply with all the requirements of the EPA Licence No. 003916, Consent No. 92/591 and specifically the requirements of this manual. The SSI requires all new employees and all existing employees (on an annual basis) to receive induction training (and retraining) in the site's environmental management requirements.

#### **Detailed Requirements**

Dixon Sand shall ensure that an acceptable standard of environmental due diligence is established and maintained within the site's workforce. All employees should have knowledge of the specific environmental management requirements. All contractor's are also required to be inducted into the environmental management requirements of the site. Information shall be readily available at the site and accessible to employees and contractors. Environmental awareness can be gained through training programs, environmental management notices and signs to "advise", "warn", "caution", "encourage", etc.

#### Consequences of Non Compliance

Corporate liability for environmental offences, and personal liability of directors and managers for such offences is now part of most environment related legislation. Environment related offences come under one of the following categories:

- · air and water pollution
- land pollution
- noise
- · occupational health and safety
- waste disposal
- material handling and storage (eg. dangerous goods)
- compliance with requirements to hold and comply with the conditions of, licences, approvals, consents, etc.

Penalties for such offences are significant and include fines and/or imprisonment.

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Issued by:	Signed by:		Date: 16.12.18
issued by	Signed by		Date

#### DIXON SANDS (PENRITH) PTY LTD - NORTH MAROOTA OPERATIONS

STANDING SITE INSTRUCTION NO:

TITLE: RESPONSES TO ENVIRONMENTAL ACCIDENTS

#### Short Description and Purpose of SSI

Conditions 7.1-7.2 and 8.1-8.4 of the EPA Licence No. 003916 require notification to the EPA in the circumstance of any accident that impacts upon the environment. This SSI sets out notification and reporting requirements under the EPA licence and the site procedures to be followed.

#### Detailed Requirements

- S7.1 If anything happens on the premises that has caused, is causing or is likely to cause harm to the environment, whether the harm occurs on or off the premises, the licensee must report the event to the EPA as soon as practicable, after it becomes known to the licensee or to one of the licensee's employees or agents.
- S7.2 The event must be reported by telephoning:
  - (a) the regional office of the EPA on the phone number specified on the licence, if during office hours; (02) 9795 5000
  - (b) the after hours telephone number on the licence, 131 555
  - (c) if in the event the EPA officer cannot be contacted at either of those numbers, the EPA's "Pollution Line" service on 131 555.
- S8.1 The EPA may make a written request that the licensee prepare a written report of any event on the premises that, in the opinion of the EPA, has caused, is causing or is likely to cause harm to the environment, whether the harm occurs on or off the premises.

See also clauses \$8.2, \$8.3, \$8.4

Procedures to be followed in the event of any accident, spill, failure, etc.

- 1) Take immediate steps to obtain medical assistance as necessary
- 2) Take immediate steps to secure site and contain effects of incident
- 3) Contact Quarry Site Manager David Dixon (phone 0414 727 223)

#### Consequences of Non Compliance

A breach of the EPA licence is prosecutable under the Pollution Control Act and the Environmental Offences and Penalties Act. Significant penalties are prescribed.

sued by: \_\_\_\_\_\_\_ Date: 16.12-9

#### DIXON SANDS (PENRITH) PTY LTD - NORTH MAROOTA OPERATIONS

STANDING SITE INSTRUCTION NO:

2

TITLE:

ACCESS TO, AND SECURITY OF THE SITE

#### Short Description and Purpose of SSI

Condition 1 of Consent No. 92/591 specifies the form of vehicular access to the site. Access from Old Northern Road via the Crown access road is the only access permitted to the site for customers, employees and contractors. The purpose of this SSI is to both define the vehicular access permitted and to set down the restrictions on personnel access to the site.

#### **Detailed Requirements**

#### **Vehicular Access**

Vehicular access to the site is only permitted via the entrance road and gate, from the Crown access road, from Old Northern Road. No other entry point or entrance route is permitted.

#### **Personnel Access**

Only persons with authorised access shall be permitted to enter the site. Unauthorised persons entering the site will be subject to trespass law.

Authorised persons include:

- Sand purchasers
- Sales representatives (with permission to enter)
- Other persons who have previously obtained authorised access approval

All authorised persons entering the site with the exception of drivers of sand trucks, must report to the office. Sand trucks can proceed directly to the stockpile area for loading.

No visitor to the site will be permitted outside the carpark / office area, except when accompanied by company representative.

Appropriate site induction will be necessary before accessing the site.

Notices are to be installed around all site boundaries advising of restricted access and warning of "Danger – quarrying"

#### Consequences of Non Compliance

Site security and safety considerations mandate strict requirements for site access. Persons entering the site without authorisation will be required to immediately leave the site and make a subsequent application for access.

Issued by: LMCE Signed by: Date: 16.12.98

DIXON SANDS (	PENRITH)	PTY LTD -	- NORTH	MAROOTA	<b>OPERATIONS</b>
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STANDING SITE INSTRUCTION NO:

TITLE: CONSTRUCTION OF STRUCTURES

Short Description and Purpose of SSI

**Detailed Requirements** 

Consequences of Non Compliance

Issued by: ...... Date:...... Date:.....

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<b>DIXON SANDS (</b> !	PENRITH) PTY	LTD - NORTH MA	<b>AROOTA OPERATIONS</b>
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STANDING SITE INSTRUCTION NO: 5

TITLE: WORKING AREAS

Short Description and Purpose of SSI

Detailed Requirements

Consequences of Non Compliance

Issued by: ...... Date:...... Date:.....

STANDING SITE INSTRUCTION NO:

6

TITLE:

**WORKING HOURS** 

# Short Description and Purpose of SSI

Condition 18 of the Consent 92/591 and Condition N2 of the EPA licence specifies approved operating hours. The SSI sets out what those hours are and what are the consequences of breaching those hours.

# Detailed Requirements

- 18. "Operations involving extraction, transportation and processing or running of machinery for maintenance purposes shall not take place on the land except between 6am and 6pm Monday to Friday, and 6am to 1pm Saturday, and at no time on Sundays and public holidays. The applicant shall ensure that its drivers and clients do not arrive at the site prior to 5.45am on any day."
- N2 "Plant and equipment associated with the extraction of sand must only be operated between 0700 and 1800 hours between Monday to Saturday, and at no time on Sunday or public holidays."

No sand winning operations shall occur outside of the hours of 7am and 6pm, Monday to Saturday. No transportation from the site, sand processing or plant maintenance shall occur outside of the hours of 6am and 6pm, Monday to Friday, and 6am to 1pm on Saturday.

# Consequences of Non Compliance

Any breach of operational hours is a breach of either the EPA Licence, the Consent or both and can be subject to prosecution. Any contractor breaching any operating hours limitation could be subject to punitive action, including cancellation of contract.

sued by: \_\_\_\_\_\_

. Signed by:....

Date: 16.12.98

STANDING SITE INSTRUCTION NO:

7

TITLE:

**COVERING PAY LOADS** 

# Short Description and Purpose of SSI

Condition 16 of Consent No. 92/591 requires that all pay loads of loaded trucks be fully covered prior to leaving the site by a suitable material, to prevent spillage and dust generation.

# Detailed Requirements

The covering of all pay loads is required of all purchasers of sand from the North Maroota sand quarry. Notices are displayed on-site stipulating that it is an offence against the requirements of the company's Consent to leave the site with an uncovered load.

All covers shall be installed immediately after crossing the weighbridge and after the recording of the weighbridge reading. Under no circumstances shall trucks leave the site with an uncovered load. Loads shall be covered under all weather conditions.

Routine checks will be carried out by company personnel. Council officers also frequently carry out random inspections to ensure such works are carried out. A "Notice" (see "Notice to all Carriers") has been issued and will be reissued at periodic intervals.

An incentive/reward scheme has also been introduced by the company.

# Consequences of Non Compliance

Contractors and purchasers breaching this requirement may be refused future access to the quarry.

STANDING SITE INSTRUCTION NO:

Ω

TITLE:

**NOISE CONTROL** 

# Short Description and Purpose of SSI

Condition 21 of Consent No. 92/591 specifies compliance with the Noise Control Act (1975). Condition N1 (a) the EPA licence No.003916 specifies noise limits to apply at the boundaries of the neighbouring residences. This SSI sets out the noise compliance requirements of the SEMR.

# Detailed Requirements

N1: "The sound pressure level of noise LA10,T generated by activities associated with the extraction of sand must not exceed the sound pressures level LA90,T of the existing ambient noise by more than 5 dB (A) when measured at the boundary of any affected residence."

An annual noise compliance survey shall be carried out by the company's noise consultant. It shall be timed to meet the requirements of the annual compliance and reporting schedules.

# Consequences of Non Compliance

Any breach of the EPA Licence or Consent can be subject to prosecution.

ed by:

. Signed by:....

16.12.98

STANDING SITE INSTRUCTION NO:

TITLE: CONTROL OF DUST

# Short Description and Purpose of SSI

Conditions 7, 9, and 16 of Consent No. 92/591 and P5 of the EPA Licence No. 003916 specify requirement for controls on dust emissions from the site. This SSI sets out specific dust control measures.

# Detailed Requirements

- CC7. Arrangements satisfactory to Council's Extractive Industries Officer are to be made for dust suppression from topsoli stockpiles until such time as vegetative consolidation takes effect.
- CC9. The applicant is to monitor dust generation from the extractive operations and associated activities. If a dust nuisance is identified, then the applicant is to immediately inform Council's Extractive Industries Officer and implement any mitigation practice required by the Extractive Industries Officer.
- CC16. Prior to leaving the site, all **loaded trucks** must have their pay-loads fully covered by a suitable material to prevent spillage from the trucks onto the roads.
- EPA P5 Unsealed trafficable areas must be maintained, at all times, in a condition which minimises the emission of wind-blown or traffic-generated dust.

The following measure shall be undertaken:

- All roads are to be watered as necessary to minimise dust generation.
- All topsoil stockpiles are to planted so as to achieve a rapid vegetative cover.
- Dust gauges are installed at five locations on the site. All gauges shall be protected, maintained and sampled on a monthly basis. Methods for sampling and analysis shall be in accordance with AS3580.10.1-1991
- In the event of monthly depositional levels being in excess of 4gm/m²/month, Council's Extractive Industries Officer shall be notified and mitigation practices shall be implemented as directed.
- Vehicular and plant access and movement around the site shall be limited to defined roadways. Controlled access will be permitted onto topsoil stockpiles and to areas undergoing rehabilitation (see SSI 5, Working Areas)
- Pay-loads are to be covered, regardless of weather conditions or time restrictions. (Refer SSI 7, Covering Pay Loads).

# Consequences of Non Compliance

Any breach of dust control provisions may constitute a breach of the EPA Licence or Consent and can be subject to prosecution under the legislation. Any contractor or purchaser breaching these requirements could be subject to punitive action by the company, including a refusal of future access to the site.

STANDING SITE INSTRUCTION NO:

10

Pg. 1 of 2

TITLE:

**OFF-SITE WATER DISCHARGES** 

# Short Description and Purpose of SSI

Conditions P1, P2, P3, P4, and P8 of the EPA Licence No. 003916 specify restrictions on water discharges. The SSI sets out the specific requirements for the management of off site discharges

# Detailed Requirements

- P1. Stormwater runoff from higher areas must be diverted away from quarrying operations.
- P2. All stormwater runoff from areas disturbed by quarrying activities must be collected and directed through a sedimentation pond.
- P3. Overland flow diversion bunds and sediment control works must be maintained until such time as the disturbed areas within the catchment of these works have been stabilised in a manner that controls soil erosion. Any bunds or sediment control structures or works that are damaged must be repaired as soon as practicable.
- P4. Stormwater collected by any sediment control structure on the premises must not be pumped to any dam which lies outside the area of the premises, or to any water course if the concentration of non-filterable residue (NFR) exceeds 50 milligrams per litre.
- P8. Excess sediment collected in sediment pond(s) must be removed when the volume of the pond(s) is reduced by 50 percent of the design capacity.

The following actions shall be undertaken:

- There shall be regular maintenance of all sediment ponds, tailings ponds and drainage bunds, to ensure they are functioning effectively. (see Section 6, Routine Inspection Requirements)
- All site runoff shall be directed to the main storage dam. No site runoff is permitted to bypass this dam. All runoff from disturbed areas must firstly pass through a site sedimentation basin (see Basins 1,2,3,4)
- Site drainage control and water management is only to be carried out in accordance with the current plan for the site's water management. Such plans are to be endorsed on an annual basis by Council and can only be altered by application to Council.
- No pumped discharges are permitted from any site storage to the main storage dam if the NFR exceeds 50mg/L
- Riparian flow releases are to be provided from the main storage dam. Operating rules are to be developed and reviewed on an annual basis, at the time of the annual water management plan review.

ssued by: \_\_\_\_\_\_ Date: 16.12.98

STANDING SITE INSTRUCTION NO:

10

Pg. 2 of 2

TITLE:

**OFF-SITE WATER DISCHARGES** 

# Detailed Requirements (continued)

- In the event of any accidental release of water off-site the requirements of SSI 2, Responses to Environmental Accidents, are to be followed.
- In the event of any discharge <u>onto</u> the site from either Portion 117 or the haul road, samples of "first flush runoff" shall be taken at the defined entry points. The samples shall be labelled in accordance with the Sampling Protocol and forwarded to an approved laboratory, again in accordance with the Protocol.
- Site analyses for NFR shall be carried out for all water samples taken, (prior to laboratory analyses.) In the event of discharges <u>onto</u> the site having an NFR greater than 50mg/L, the EPA is to be immediately notified, in accordance with the requirements of SSI 2. Written confirmation to both the EPA and Council shall follow.

# Consequences of Non Compliance

Any breach of these requirements is a breach of the Licence or Consent. It is also a breach of this manual. It can be subject to prosecution under the appropriate Act.

ssued by:

Signed by:....

Date: 16.12.98

STANDING SITE INSTRUCTION NO:

11

TITLE:

**VEGETATION CONSERVATION** 

# Short Description and Purpose of SSI

Conditions 8 and 11 of Consent 92/591 require the protection of the vegetation adjoining the site. Condition 11 is for the purpose of protecting amenity, which can in part be protected through the maintenance and/or provision of screening vegetation. This SSI sets out the actions to be taken to ensure the protection of vegetation.

# **Detailed Requirements**

- CC8. Care is to be taken to ensure that all natural bushland directly adjoining the extraction site is not damaged.
- CC11. The proposal is to be conducted in such a manner so that the amenity of the adjoining and nearby residents is not adversely affected.

# The requirements of this SSI are:

- Prescribed setbacks are to be maintained and no clearing of vegetation within the setbacks shall be permitted. Where clearing has been carried out previously, vegetation shall be reestablished.
- Visual access of disturbed areas of the site shall be restricted, to the maximum extent possible. Screening vegetation and bund walls can be used to limit visual access. Bund walls should not be constructed within setbacks.
- Operations in proximity to setbacks from natural bushland shall be carried out so as to limit
  impacts on the bushland. Effects of dust, drainage, noise etc shall be managed appropriately
  to control off site effects.

# Consequences of Non Compliance

Any breaches of vegetation conservation are breaches of the Consent and are subject to prosecution under the respective Act. Lack of proper consideration of the importance of the amenity of the Maroota community and local residents and the control of off site effects, is a breach of the company's Environment Policy and can do great harm to the company's reputation.

ssued by:  $\angle MCE$ 

. Signed by:...

16.12.98

DIXON SANDS (PI	ENRITH) PTY LTD -	- NORTH MAROOTA	<b>OPERATIONS</b>
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STANDING SITE INSTRUCTION NO:

12

TITLE:

**TAILINGS PONDS** 

Short Description and Purpose of SSI

**Detailed Requirements** 

Consequences of Non Compliance

Issued by: ...... Date:...... Date:.....

ATTACHMENT C

**ROUTINE INSPECTION FORMS** 

Issued by: ...... Date:...... Date:......

DIXON SAND (PENRITH) PTY LTD.

NORTH MAROOTA SAND OPERATIONS

**ROUTINE INSECTION FORM** 

This form has not yet been issued.

ssued by:	Signe	by:	Date:
-----------	-------	-----	-------

ATTACHMENT D

**COMPLAINTS REGISTER** 

Issued by: ...... Date:...... Date:.....

# NORTH MAROOTA SAND OPERATIONS

# **COMPLAINTS REGISTER**

DATE	COMPLAINT DETAILS	COMPLAINAI	NT RESPONSE TO COMPLAINT	
		·	•	
		1		
]				

Complaint Taken By	
Response Organised By	
Quarry Manager	

ATTACHMENT E

NOTICES

# NOTICE TO ALL CARRIERS

All customers of Dixon Sand, purchasing sand from the north Maroota site, must comply with the consent requirements of our development approval. In particular:

- 1. The approved hours of operation for the site are 6.00am to 6.00pm, Monday to Friday, and 6.00am to 1.00pm, on Saturday. No truck is to arrive at the Dixon Sand site before 5.45am. Any vehicles that do so may not be permitted entry.
- 2. Before leaving the site, all loaded trucks MUST have a tarpaulin covering their load. Trucks without these tarps will be sent back to the loading area and asked to dump their sand.

Your co-operation on these matters is appreciated.

Can you please ensure that all your drivers are aware of these requirements.

(This notice is to be forwarded to all customers with their invoices, commencing September 1998, and handed to all truck drivers who attempt to access the site before 6am or who are observed leaving the site without covering their loads – prepared and issued by Tim Macoun, Lyall & Macoun, on behalf of Dixon Sand (Penrith) Pty Ltd.

Issued by:

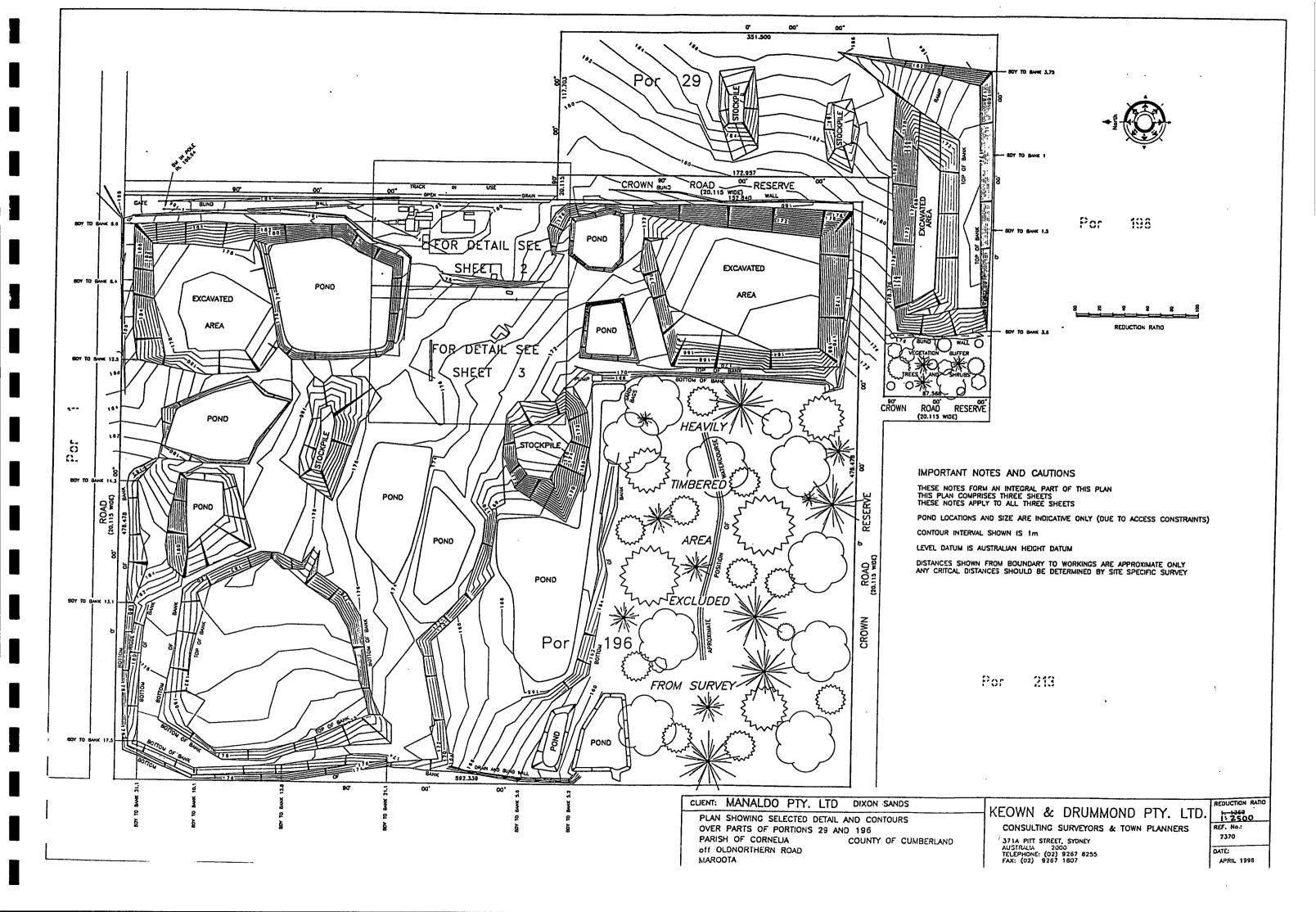
Signed by:

.Date:.

Sept 98

ATTACHMENT F

SITE LAYOUT PLAN



# EXTRACTION, REHABILITATION AND PROCESSING OF CONSTRUCTION SANDS, LOTS 196 AND 29, DP 752025 NORTH MAROOTA, NSW

VOLUME 3:
ENVIRONMENTAL IMPACT STATEMENT
For
DIXON SAND (PENRITH) PTY LTD

AUTHORITY CONSULTATION
ATTACHMENT TO A3 CONSULTATION

# **Table of Contents**

- 1. Department of Urban Affairs and Planning (DUAP)
- 2. Department of Land and Water Conservation (DLWC)
- 3. Department of Mineral Resources (DMR)
- 4. Hawkesbury- Nepean Catchment Management Trust (HNCMT)
- 5. National Parks and Wildlife Service (NP&WS)
- 6. NSW Agriculture (NSW Ag)
- 7. Environment Protection Authority (EPA)
- 8. Road and Traffic Authority (RTA)
- 9. Baulkham Hills Shire Council (BHSC)

# **New South Wales Government**

# Department of Urban Affairs and Planning

2.0 MAY 1008

T. W. Macoun Lyall & Macoun Consulting Engineers PO Box 5215 CHATSWOOD 2057

Contact:

Meredith McIntyre

Our Reference:

S98/00466

Your Reference:

Dear Mr Macoun,

# Proposed Environmental Impact Statement for a Continuing Quarry and Processing Operations, Part Portion 196 and Portion 29, Maroota (Dixon Sands (Penrith) Pty Ltd)

Thank you for your letter of 16 April 1997 seeking consultation with the Director-General for the preparation of an environmental impact statement (EIS) for the above development.

Under clause 52 of the Environmental Planning and Assessment Act Regulation 1994 (the Regulation), the Director-General requires that the key issues outlined below are specifically addressed in the EIS.

# **Key Issues**

- Sydney Regional Environmental Plan No. 9 (2) Extractive Industry
- Sydney Regional Environmental Plan No. 20 Hawkesbury Nepean River
- State Environmental Planning Policy No. 11 Traffic Generating Developments
- State Environmental Planning Policy No. 33 Hazardous and Offensive Development
- Potential impact on Maroota Sands Swamp Forest, an endangered ecological community, and any other species under the Threatened Species Conservation Act 1995
- Potential groundwater and other water quality impacts
- Baulkham Hills Development Control Plan No. 500 Extractive Industry

The EIS shall be prepared in accordance with clauses 50 and 51 of the Regulation. Statutory requirements for the form and content of the EIS are outlined in Attachment No. 1.

You should have regard for the Department's EIS Guideline 'Extractive Industries Quarries'. It contains a guide to the type of information most likely to be relevant to the development you propose. Not all the matters it contains may be appropriate for

Governor Macquarie Tower 1 Farrer Place, Sydney 2000 Box 3927 GPO, Sydney 2001

Telephone: (02) 9391 2000 Facsimile: (02) 9391 2111

consideration in the EIS for your proposal; equally, the guide is not exhaustive. The Guideline is available for purchase from the Department's Information Centre, 1 Farrer Place, Sydney or by calling (02) 9391 2222.

As a result of recent amendments to the Environmental Planning and Assessment Act 1979, development applications lodged on or after 1 July 1998, where certain licences or other approvals are required, (as shown on Attachment 2), will be "integrated development". Should your proposal be integrated development, you must consult with the relevant agencies and obtain their requirements when preparing your environmental impact statement.

You should consult with Baulkham Hills Shire Council and take into account any comments Council may have in the preparation of the EIS. Other issues emerging from consultation with relevant local, State and Commonwealth government authorities, service providers and community groups are to be addressed in the EIS.

Should you require any further information regarding the Director-General's requirements for the EIS, please contact Ms Meredith McIntyre on (02) 9391 2384.

Yours sincerely,

Con David Mutton 18 519

Acting Manager

Major Assessments and Hazards Branch

As Delegate for the Director-General

# DEPARTMENT OF URBAN AFFAIRS AND PLANNING

# Attachment No. 1

# STATUTORY REQUIREMENTS FOR THE PREPARATION OF AN ENVIRONMENTAL IMPACT STATEMENT UNDER PART 4 OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

In accordance with the Environmental Planning and Assessment Act 1979 (the Act), an environmental impact statement (EIS) must meet the following requirements.

## Content of EIS

Pursuant to Schedule 2 and clause 51 of the Environmental Planning and Assessment Regulation 1994 (the Regulation), an EIS must include:

- 1. A summary of the environmental impact statement.
- 2. A statement of the objectives of the development or activity.
- 3. An analysis of any feasible alternatives to the carrying out of the development or activity, having regard to its objectives, including:
  - (a) the consequences of not carrying out the development or activity; and
  - (b) the reasons justifying the carrying out of the development or activity.
- 4. An analysis of the development or activity, including:
  - (a) a full description of the development or activity; and
  - (b) a general description of the environment likely to be affected by the development or activity, together with a detailed description of those aspects of the environment that are likely to be significantly affected; and
  - (c) the likely impact on the environment of the development or activity, having regard to:
    - (i) the nature and extent of the development or activity; and
    - (ii) the nature and extent of any building or work associated with the development or activity; and
    - (iii) the way in which any such building or work is to be designed, constructed and operated; and
    - (iv) any rehabilitation measures to be undertaken in connection with the development or activity; and

- (d) a full description of the measures proposed to mitigate any adverse effects of the development or activity on the environment.
- The reasons justifying the carrying out of the development or activity in the manner proposed, having regard to biophysical, economic and social considerations and the principles of ecologically sustainable development.
- A compilation, (in a single section of the environmental impact statement) of the measures referred to in item 4(d).
- A list of any approvals that must be obtained under any other Act or law before the development or activity may lawfully be carried out.
- 8. For the purposes of Schedule 2, the principles of ecologically sustainable development are as follows:
  - (a) The precautionary principle namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.
  - (b) Inter-generational equity namely, that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.
  - (c) Conservation of biological diversity and ecological integrity.
  - (d) Improved valuation and pricing of environmental resources.

#### Note

The matters to be included in item (4)(c) might include such of the following as are relevant to the development or activity:

- (a) the likelihood of soil contamination arising from the development or activity;
- (b) the impact of the development or activity on flora and fauna;

- (c) the likelihood of air, noise or water pollution arising from the development or activity;
- (d) the impact of the development or activity on the health of people in the neighbourhood of the development or activity;
- (e) any hazards arising from the development or activity;
- (f) the impact of the development or activity on traffic in the neighbourhood of the development or activity;
- (g) the effect of the development or activity on local climate;
- (h) the social and economic impact of the development or activity;
- the visual impact of the development or activity on the scenic quality of land in the neighbourhood of the development or activity;
- (j) the effect of the development or activity on soil erosion and the silting up of rivers or lakes;
- (k) the effect of the development or activity on the cultural and heritage significance of the land.

An environmental impact statement referred to in Section 77(3)(d) of the Act shall be prepared in written form and shall be accompanied by a copy of Form 2 of the Regulation signed by the person who has prepared it.

Procedures for public exhibition of the EIS are set down in clauses 55 to 57 of the Regulation.

Attention is also drawn to clause 115 of the Regulation regarding false or misleading statements in EISs.

## <u>Note</u>

Should the development application to which the EIS relates not be exhibited within 2 years from the date of issue of the Director-General's requirements, under clause 52(5) of the Regulation the proponent is required to reconsult with the Director-General.

# **EXTRACT FROM EP&A ACT 1979**

(effective from 1 July 1498)

# 91 What is "integrated development"?

(1) Integrated development is development (not being complying development) that, in order for it to be carried out, requires development consent and one or more of the following approvals:

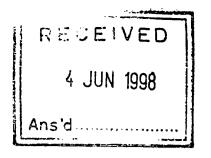
Act	Provision	Approval	
Fisheries Management Act 1994	s 144	aquaculture permit	
	s 201	permit to carry out dredging or reclamation work in any waters	
	s 205	permit to cut, remove, damage or destroy marine vegetation on public water land or an aquaculture lease, or on the foreshore of any such land or lease	
Heritage Act 1977	s 58	approval in respect of the doing or carrying out of an act, matter or thing referred to in s 57 (1)	
Mine Subsidence Compensation Act 1961	s 15	approval to alter or erect improvements within a mine subsidence district or to subdivide land therein	
National Parks and Wildlife Act 1974	s 90	consent to knowingly destroy, deface or damage or knowingly cause or permit the destruction or defacement of or damage to, a relic or Aboriginal place	
Pollution Control Act 1970	s 17A (includ ing s 17C) and s 17D	licence in respect of any one or more of the following:  (a) scheduled premises or scheduled equipment within the meaning of the Clean Air Act 1961,  (b) the pollution of waters within the meaning of the Clean Waters Act 1970,  (c) a drain which discharges or is likely to be used for discharging any pollutants into any classified waters within the meaning of the Clean Waters Act 1970,  (d) scheduled premises within the meaning of the Noise Control Act 1975	

Act	Provision	Approval
Pollution Control	s 17I	pollution control approval
Act 1970		
Rivers and	Part 3A	permit under Part 3A
Foreshores		
Improvement Act		
1948		
Roads Act 1993	s 138	consent to:
		(a)erect a structure or carry out a work in, on
		or over a public road, or
		(b)dig up or disturb the surface of a public road, or
-		(c)remove or interfere with a structure, work
		or tree on a public road, or
		(d)pump water into a public road from any
		land adjoining the road, or
		(e)connect a road (whether public or private)
a :: a	1 212	to a classified road
Soil Conservation	s 21D	authority authorising the ringbarking, cutting
Act 1938		down, felling, poisoning
·		or destruction in any other manner or the
		topping, lopping or removing of any trees on protected land
Waste Minimisation	s 44	licence to occupy a controlled waste facility
and Management	3 ++	necesses to occupy a controlled waste facility
Act 1995	1	
Water Act 1912	s 10	licence to construct and use a work, and to
	-	take and use water, if any, conserved or
[		obtained by the work, and to dispose of the
<u> </u>	<u> </u>	water for the use of occupiers of land
	s 13A	licence to construct a supply work and to
		take and use water obtained thereby
	s 18F	permit to construct and use a work, and to
		take and use water, if any, conserved or
	[	obtained by the work, and to dispose of the
		water for the use of occupiers of land for any
	s 20B	purpose other than irrigation authority to take water from a river or lake
	3 200	for the purposes of a joint water supply
		scheme
	s 20CA	authority to construct a supply work and to
		take and use water conserved or obtained
	<u> </u>	thereby
	s 20L	group licence
	s 116	licence to commence sinking a bore or to
		enlarge, deepen or alter a bore
	Part 8	approval to construct a controlled work



- (2) Development is not integrated development in respect of the consent required under section 90 of the National Parks and Wildlife Act 1974 unless:
  - (a) a relic referred to in that section is known, immediately before the development application is made, to exist on the land to which the development application applies, or
  - (b) the land to which the development application applies is an Aboriginal place within the meaning of that Act immediately before the development application is made.
- NB. The above Section 91 of the Act does not come into effect until 1 July 1998. All environmental impact statements (EIS) prepared (but not lodged with a consent authority) before that date MUST consider the above section in preparing an EIS.

Date: 28th May, 1998 Our Reference: MN98H126 Contact: Philip Pidgeon Phone: 02 9895 6260





Lyall & Macoun Consulting Engineers P.O. Box 5215 West Chatswood, Nsw, 2057

Attention:- Tim Macoun

Dear Sir,

# RE: DIXON SANDS PTY LTD - 'AREA A', MAROOTA OPERATIONS

I refer to the focus forum of Wednesday May, 28th at which the various representative agencies discussed the issues relevant to the above operation. To clarify the input of John Filocamo, Dan McKibbon Trevor Flewin and myself please refer to the points below;

# **Crown Lands Issues**

- Setbacks from Crown lands (ie; roads and reserves) are not prescriptive but, in the case of the Maroota operation 10 metres would suffice with batters and drainage set in accordance with Soil Conservation Service requirements.
- Use of Crown land which has not been identified as suitable for extraction will require a
  land assessment under the Crown Lands Act, 1989 in order that a licence for extraction
  may be issued. Where that land falls within areas designated for extraction in SREP 9(2)
  Extractive Industries and the environmental investigation contained in the EIS is
  favourable, a good case could be made for wavering the land assessment. Nevertheless the
  Department is obliged by ICAC guidelines to employ a competitive means of disposal (ie;
  tender) when seeking to have the site occupied by private interests.
- Portions 196 and 29 are held under freehold title and include title restrictions on Portion 196 which limit freehold depth to 15.24 metres. Any operations below this depth would be on Crown land and the issue of land assessment arises again however as the land is already under extraction and within a SREP9 area a good case could be made for waiving the land assessment. DLWC and Dixons Sands need to come to an early agreement on the original topography of the land in order that extractive depths are clearly defined. Apart from royalty issues, Owners consent (DLWC) would be required for lodgement of the Development Application below 15.24 metres and this raises the question of Native Title. If the proposed DA seeks to extend extraction beneath 15.24 metres Dixons will need to lodge a Non-Claimant Application with the Native Title Tribunal through this Office. A Non-Claimant Application is notice of intention to use the land by a non-aboriginal body (Dixons) and is lengthy process so should be commenced as soon as possible.
- Closure of Crown roads is possible where those roads are no longer required for access or where alternative access arrangements can be made. Any application to close a road will be considered on its merits however no guarantee can be given to the success or otherwise of the application. If a road is closed the land would firstly be offered to the adjoining freehold owners for sale at current market value as determined by the State Valuation Office. If you wish to apply to close a road you should fill in the attached CL29-2 form and forward to this Office together with an application fee of \$800.00. Please refer to the

attached form "B" for a breakdown of further costs following a successful road closing. Any queries you have on road related matters should be directed to either Janice McGufficke (9895 6248) or Tony Dahlen (9895 6251) of this Office.

### Groundwater issues

In accordance with Baulkham Hills Shire Council DCP for extractive industry, the depth of mining will be limited by the position of the water table associated with the Hawkesbury Sandstone Aquifer. Hence, a schematic representation of the water table configuration (in terms of RL contours) over the proposed mining areas will be needed. This will most probably necessitate groundwater investigation drilling with at least one bore constructed in the central or eastern part of the development site. It would be desirable that any investigation bore(s) be completed as piezometers for ongoing monitoring of water level and quality. A licence under the provisions of Part V of the Water Act will be necessary for all groundwater investigation bores.

#### Soil Conservation Service

The Department requires development to meet all statutory pollution law and regulatory requirements, including the Soil Conservation Act (1938). To achieve this the Department recommends that an Erosion and Sediment Control Plan (ESCP) be developed.

Implementing erosion and sediment control measures are important before and during any development. It is essential to minimise onsite erosion and to prevent the offsite sedimentation of downslope properties, streams and waterbodies.

In this context, the Department offers the following guidelines for use in the environmental assessment where appropriate for soil and land management issues.

- Investigate site features to ensure that the required environmental outcomes and the proposed quarry expansion are compatible (including landscape, hydrologic and soil limitations).
- Permanent drainage and sediment control works should be immediately vegetated/stabilised.
- Stockpiles should be stored outside hazard areas such as drainage lines and heavily trafficked areas.
- Temporary erosion control measures should be incorporated at all stages of development.
  The control of erosion as close to the source as possible can reduce the subsequent demand
  on sediment trapping structures. (Aim to manage stormwater runoff at a non-erosive
  velocity and protection of disturbed soil surface).
- Stormwater runoff from disturbed areas should be filtered through sediment trapping structures. Where practicable, runoff from undisturbed areas should be controlled separately.
- Disturbed areas should be progressively stabilised and revegetated so that no areas remain exposed to erosion damage for more than 14 days after earthworks cease. Temporary sediment control measures should be removed once sites have an established vegetative surface cover.
- All erosion and sediment control measures should be inspected regularly and maintained in good working condition. Maintenance should ensure that accumulated sediment is removed from filter fences, traps and basins before 60% of the available capacity is lost.

The Department recommends that the ESCP should be an effective and workable document to be understood by all contractors and subcontractors on site. The plan should meet the standards required by Local Council, EPA and DLWC.

The Department recommends the ESCP nominate a responsible person on site with appropriate experience in soil conservation to maintain and monitor the effectiveness of the control measures.

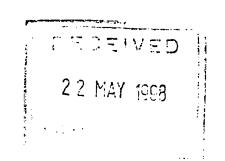
Where considerable earth shaping is to be undertaken there may be a need to develop a progressive ESCP, which is progressively implemented as the landform and erosion and sedimentation risks vary. The erosion and sediment control measures should be in place before any works commence and must be properly monitored and maintained until full stabilisation of the site has been achieved.

If you have any questions in relation to the above please contact the relevant Officer on 98957503 during normal business hours.

Yours faithfully,

Philip Pidgeon

for District Manager.





Lyall & Macoun Consulting Engineers
PO Box 5215
CHATSWOOD WEST NSW 2057

Contact: John Ross Phone: (02) 9895 7441

Our Ref: 0059825 [ SCFL46.DOC ] Your Ref: OW560

19.5.98

Attention: Ms Jill Wright

Dear Sir/Madam,

# Re: EIS Requirements, Above Referenced Continuation, Sand Extraction, Maroota.

Thank you for your letter of 30 April 1998, seeking this Department's comments and requirements for the above EIS.

#### Water Resources Matters

In the conduct of the investigations, it is recommended that you make full use of the seven water resources documents sent to your Mr T W Macoun with the Department's letter of 3 March 1997 and listed below. All appropriate matters discussed in these guideline documents should be dealt with in the above EIS, along with any other appropriate matters included in the above letter (2 track).

- a) "Amendments to the NSW Rivers and Foreshores Improvement Act";
- b) "The 7-Step Method of controlling Bank Erosion and Sediment Build-up";
- c) "A Guide to Stream Channel Management";
- d) "The Importance of the Riparian Zone in Water Resource Management A Literature Review";
- e) "NSW State Rivers and Estuaries Policy";
- f) "Minimum Standards for Works in Rivers and Lakes"; and
- g) "General Requirements for Environmental Impact Statements". (This is essentially a checklist of water resources matters to be addressed in the assessment of environmental impacts).

In addition the following Crown Land matters need to be taken into consideration:

• stormwater - overland flows should not be concentrated or diverted from their natural flowline. Roofwater shall not be discharged directly onto Crown land;

- the velocity and volume of stormwater flows to Crown land must be no greater than those before the proposed development;
- any stormwater control structure must be designed and constructed in accordance with the 1992 Urban Erosion and Sediment Control Guidelines;
- buildings in close proximity to or in direct view of Crown land should have an external
  finish to blend in with the background environment or be adequately screened from
  view. Furthermore, where the building is close to the common boundary, shadowing of
  Crown land is to be avoided;
- any excavation or fill is to be contained entirely within the proponent's property and shall not jeopardise the longevity of any vegetation on Crown land. Where fill is proposed adjoining the common boundary it shall be properly drained and retained or battered back and revegetated to prevent the escape of any material onto Crown land;
- access to any part of the proponent's property is not be over Crown land. Should the proponent wish to construct a Crown road, permission in writing must first be obtained from the State Lands Service before any work commences; and
- any fire reduction zone required by a development that adjoins reserved Crown land is to be completely within that development boundary.

I trust the above comments and information will be helpful.

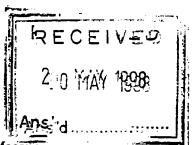
Yours sincerely,

Jahakon

John A Ross, Environmental Review Co-ordinator, for Resource Planning Manager,

Sydney-South Coast Region

(Attach.)



Mr TW Macoun
Lyall and Macoun Consulting Engineers
PO Box 5215
WEST CHATSWOOD NSW 2057



NSW DEPARTMENT OF MINERAL RESOURCES
Minerals and Energy House, 29-57 Christie Street
(P.O. Box 536), St Leonards, NSW 2065, Australia
Phone (02) 9901 8888 · Fax (02) 9901 8777
DX 3324 St Leonards

Our ref: L93/0339 Your ref: OW560

# ENVIRONMENTAL IMPACT STATEMENT PART PORTION 196 AND PORTION 129 MAROOTA DIXON SANDS (PENRITH) PTY LTD

Dear Mr Macoun

I refer to your letter of 28 April, 1998, regarding the Planning Focus meeting and development application for sand quarrying at Maroota by Dixon Sands (Penrith) Pty Ltd. Mr S Lishmund will be available to attend the Planning Focus meeting on 27 May. The following comments relate to the preparation of the Environmental Impact Statement (EIS).

The site of the quarry is within an area considered under Sydney Regional Environmental Plan No 9 Extractive Industry (No 2) to contain resources of regional significance. Although this Department has no statutory role over construction sand under the Mining Act 1992, it is the principal government authority responsible for regional assessments of the State's resources of construction materials and for advising State and Local government on their planning and management. This Department considers the following resource information essential for inclusion in an EIS for a sand extraction operation:

This Department considers the following resource information essential for inclusion EISs:

- The amount of material available for extraction, and the method or methods used to determine
  this amount (e.g. drilling, trenching). Plans and cross-sections summarising this data, at a
  standard scale, showing location of drillholes etc. and the area proposed for extraction, should
  be included in the EIS. Relevant supporting documentation such as drill logs should be
  appended...
- Characteristics of the material to be produced.
- An assessment of the quality of the material based on the testing and of the suitability of the material for the usual range of applications should be given.
- Anticipated annual production and life of the operation.
- Alternative sources to the proposal and their availability.
- Justification for the proposal in terms of local and, if appropriate, regional context.

The operator must observe all relevant requirements of the Mines Inspection Act, 1901 (as amended). Advice on these requirements should be sought from the Regional Inspector of Mines, Mr P Diamantes - telephone (02) 9869 4763.

. If you have any queries on this matter, please contact Ms Helen Ray directly on (02) 9901 8362.

Yours faithfully

SR Lishmund For Director-General

**CATCHMENT MANAGEMENT TRUST** 

18<sup>th</sup> May 1998

Lyall & Macoun Consulting Engineers PO Box 5215 W CHATSWOOD NSW 2057

Contact:

**Tony Towers** 

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LM/BH/EIS Our ref: mar-196-a

Your Ref:

ow560

Dear Mr Macoun,

# Proposed Extractive Industry, Part Portion 196 and Portion 29. Maroota

Thank you for your letter seeking our requirements for the EIS on the above proposal. The Trust's general requirement is that the EIS address the impact of the proposal upon the Hawkesbury-Nepean River and its catchment. In particular, the Trust recommends that the following issues be assessed:

1. Water quality and quantity: The project should satisfy the Trust's policy on water quality and quantity which states: Any development must not lead to a deterioration of the ecosystem or compromise its environmental values. Therefore if the quality of water (both surface and groundwater) emanating from an area is satisfactory, then any proposed development should not result in a decrease in this quality; alternatively if the quality is not satisfactory, then any proposed development should result in an improvement to this quality.

Specifically, any proposed development should achieve the following environmental values for water:

- Any water flow or changes in flow from the area should not alter the downstream natural hydrology (frequency or peaks) for all events up to the one in two year storm event (30 minute event), and should not alter the downstream peak levels for events up to the 1 in 100 year event.
- All development shall be designed to maintain or enhance water quality to a standard that would not compromise the:
  - ANZECC Guidelines standard for healthy waters protection of aquatic ecosystems; and
  - NHMRC Guidelines for visual amenity and primary contact recreational water quality.
- Groundwater, for drinking water supply, should be protected from the impacts of any contaminated surface waters.

Specifically, the EIS should address the outcomes from the Maroota Groundwater Study Stage 1 and 2 (draft) reports. At this stage, the Trust's preference is that the groundwater study should be completed and a groundwater management plan in place before any further major developments are approved. If a proposal is to proceed, then the depth of extraction should be defined as being no deeper than 2 metres above the seasonally high watertable. The EIS should determine this level.

- 2. Final landform: The final landform and revegetated landscape should deliver a rainfall recharge rate no less than that which existed prior to any disturbance of the site. Further, the final landform should be geomorphologically stable. The final use should be indicated, with reasons why that use would be suitable.
- 3. Protection of fauna and flora: An objective of the proposal should be to maintain the biodiversity values of the site. This will require active management on the site. It is also critical that the ecological integrity of adjacent creeks is maintained. In this regard, your attention is drawn to wetland no.88 located downstream of the site. This wetland is recognised as regionally significant under Sydney REP No.20 Hawkesbury Nepean River (No.2 1997). Any significant effect on threatened species, populations or communities should also be assessed in terms of section 5A of the EP&A Act to determine whether the proposal will require the preparation of a Species Impact Statement.
- 4. **Measures to maintain air quality:** The EIS should indicate measures for dust suppression from quarry activities and haulage vehicles.
- 5. Environmental management and rehabilitation plan: The Extractive Industries/Quarries Practice Guideline (July 1994) prepared by the DUAP identifies the need for an Environmental Management and Rehabilitation Plan. The Trust strongly supports the preparation of such a plan which could take the form of an Environmental Management System consistent with ISO 14000. An outline of the plan should be indicated in the EIS, including:
  - (a) Water quality management regarding:
    - the flow regime of receiving waters and the impact upon that regime;
    - the nature of run-off from the existing activity and the likely impact of the proposal on water quality, the effect of the final land form, the means of collection and disposal of surface water run-off, the proposed management of waste waters, oils and grease, disposal of effluent and rubbish, control measures for the stockpiles, erosion and sediment controls;
    - the quality of the ground water and any likely infiltration into the ground water, effects on ground water and water bores, in the context of the Maroota Groundwater Study.
  - (b) Vegetation management including, but not limited to:
    - important vegetation communities:
    - revegetation of disturbed areas in the long and short term and landscaping.

- (c) On-site materials management:
  - usual operating procedures and emergency/contingency plans;
  - monitoring and reporting mechanisms.

The EIS should also address the provisions of Sydney REP 20 (No.2 - 1997). No formal consultation with the Trust is required under the REP.

The above advice does not indicate that the Trust will either support or object to the proposal. We will make that decision only after an assessment of the forthcoming EIS has been made.

Should you wish to discuss any matter raised in this letter, please contact the Trust.

Yours sincerely,

alarean

fir Malcolm Hughes

**Program Leader - Catchment Planning** 

cc. Frank Braybrooks - Chairperson
Martin James - Catchment Co-ordinator
Cattai Catchment Management Committee



NSW NATIONAL PARKS AND WILDLIFE SERVICE

Mr Tim Macoun Lyall and Macoun Consulting Engineers PO Box 5215 WEST CHATSWOOD NSW 2057

Your Ref.: OW560

Dear Mr Macoun

RE: Continuing quarrying and processing operations, Part Portion 196 and Portion 29, Marcota

I refer to your letters dated 30 April and May 1998, in which you consult with the National Parks and Wildlife Service on the above proposal. As indicated in recent discussions with your office (Ms Jill Wright), unfortunately it will not be possible for a representative of the NPVS to attend the consultation meeting on 27 May. However, the NPWS offers the following advice which should assist in progressing preparation of the EIS.

The NPWS has a statutory responsibility for the protection and care of native flora, native fauna and Aboriginal sites, and for the management of NPWS estate. Accordingly the NPWS has an interest in ensuring that potential impacts to these attributes are appropriately assessed.

To assist you in this regard, it is recommended that the matters referred to in the attached guidelines titled "General Guidelines for Impact Assessment" be addressed in your assessment where appropriate. These guidelines also provide information on any approvals that may be relevant under the National Parks and Wildlife Act and a summary of the NPWS' databases which may be of assistance to you in your assessment.

it is requested that any EIS forwarded to the NPWS for comment during the public exhibition period state the reasons for the referral. The NPWS typically comments on EIS's where there is a statutory concurrence or approval role for the NPWS, or where there is likely to be a threat to NPWS reserves or regionally significant conservation values.

Sydney Zone 6th Floor 43 Bridge Street Humbelle NSW Australia PC Box 1967 Humbelle 2220 Fax: (02) 9585 6442 Tel: (02) 9585 6678

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Please contact me on (02) 9585-6921 if you have any questions concerning this matter.

Yours sincerely,

R. Fante 18/5/98

Ray Fowke Environmental Planning Officer SYDNEY ZONE

With the second

OW560 12 May, 1998



# Sydney and South Coast

# NSW Agriculture

299 George Street Windsor 2756 (Locked Bag 11)

Telephone: (045) 770 600 Facsimile: (045) 770 650

T W Macoun Lyall & Macoun Consulting Engineers PO Box 5215 W CHATSWOOD NSW 2057

Dear Mr Macoun

# Continuing Quarrying and Processing Operations Dixon Sands, Maroota NSW

I refer to your letter of 1 May 1998 which sought nominations from the Department of a representative to attend a planning focus meeting on 27 May and identification of issues to be addressed in any prospective EIS.

As I advised you over the phone on 8 May 1998 Mr Bill Yiasoumi, Acting / Agricultural Environment Officer Windsor, will be available to attend the planning focus meeting scheduled for the 27 May.

In relation to the issues to be addressed in the prospective EIS NSW Agriculture considers the following issues of primary importance:

- the direct alienation of agricultural land resources;
- the potential conflict with agricultural activities over issues such as noise, dust, trucks etc...;
- the potential impact on surface and ground water quality, quantity and reliability of supply; and,
- proposed methods of rehabilitation with a view that disturbed sites will be rehabilitated to a level of at least pre-disturbance agricultural suitability.

In addressing these issues I feel it is important that a clear assessment of the significance of the potential impacts of the proposal be made. Further, the future monitoring program and management response to adverse monitoring results needs to be clearly identified.

For further clarification of these comments or to provide further details on the planning focus meeting please contact Bill Yiasoumi at the above address.

Yours sincerely

Tom Grosskopf

Agricultural Environment Officer

WINDSOR

1 5 MAY 1998



Mr Macoun Lyall & Macoun Consulting Engineers PO Box 5215 W CHATSWOOD NSW 2057

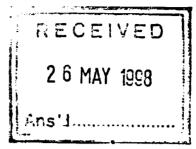
Our Reference: 300609/B1

Your Reference:

Job No:OW560

Contact:

Rod Aubrey



Environment Protection Authority New South Wales

Civic Tower Cnr of Jacobs Street and Rickard Road Locked Bag 1502 Bankstown NSW 2200

Telephone. 02. 9795 5000 Facsimile. 02. 9795 5002 www.epa.nsw.gov.au

Dear Mr Macoun

Re: <u>Preparation of an Environmental Impact Statement for</u>
<u>Proposed Sand Extraction Operation At Part Portion 196 and Portion 29. Maroota</u>

I refer to your letter dated 30 April 1998 seeking advice from the Environment Protection Authority (EPA) about the scope and content of an Environmental Impact Statement (EIS) for the proposed continuation of sand extraction from part Portion 196 and Portion 29, Maroota. The EPA appreciates the opportunity to provide advice at this early stage of the proposal.

The EPA expects the proponent to address the issues contained in the Department of Urban Affairs and Planning's EIS Practice Guideline for "Extractive Industries Quarries". The following information also provides you with a range of additional issues or more specific expectations for consideration during the environmental impact assessment of the proposed sand extraction activity and outlines the broad principles within which the EPA offers these comments.

## The EPA's Role

The EPA recognises the potential environmental and economic benefits that can be derived from considering environment protection and pollution prevention measures at the planning and development stages, and by designing ecologically sustainable systems. The Protection of the Environment Administration Act 1991 charges the EPA with, among other things, responsibility for promoting pollution prevention and having regard for the need to maintain ecologically sustainable development (ESD).

The Protection of the Environment Administration Act maintains that ESD requires the effective integration of environmental and economic considerations in decision-making and also that ESD can be achieved by the implementation of such principles and programs as:

- \* the precautionary principle namely, that if there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environment degradation;
- intergenerational equity namely that the present generation should ensure that the health,

diversity and productivity of the environment is maintained or enhanced for the benefit of future generations;

- conservation of biological diversity and ecological integrity; and
- \* improved valuation and pricing of environmental resources.

The EPA considers that the planning process and any subsequent development should incorporate objectives and mechanisms for achieving ESD.

## Surface Water Management

The proponent should identify, describe and quantitatively assess the impacts that may be caused to surface water quality during both the site establishment and operating stages. In this regard the EIS should include a detailed surface water management plan. The surface water management plan should include catchment areas, basin, spillway and flow diversion design and sizing and detail how the runoff contained on the site will be managed following storm events to return the system to its design capacity. The EPA would prefer the system to be operated as a closed water management system.

The surface water management plan should also include measures for preventing pollution from fuel storage, machinery operation and maintenance areas on the site.

The EPA is currently finalising appropriate design criteria for sizing of water management system, which we expect to be available by the meeting next week. In the mean time you should consider the principles for sediment and erosion control measures as outlined in the Department of Housing's "Soil and Water Management for Urban Development" or the former Department of Conservation and Land Management's "Urban Erosion and Sediment Controls" book.

# Groundwater Management

The EIS should include an assessment of the impacts of quarrying on groundwater quality and availability. In particular, the EIS should investigate and quantitatively assess the likely impacts of quarrying on the level of the water table and any associated effects on other groundwater users in the area, adjacent bushland and habitat values.

# Air Pollution

The EPA is concerned with maintaining or improving ambient air quality. From past experience, the EPA generally considers that ambient dust deposition rates should not exceed 4.0g/m²/month. The EIS should therefore investigate existing dust deposition rates, estimate the additional contribution to dust deposition that would result from the proposed quarrying activity and describe management strategies to ensure that dust generation is minimised and that ambient conditions does not exceed an upper limit of 4.0 g/m²/month.

# Noise Impact Assessment

The EIS should include a noise impact statement which:

- a) determines the present ambient noise levels (LA90T) at nearby residential dwellings (with the current extraction not operating);
- b) predicts the noise levels (LA10T) at the most affected residential premises or other noise sensitive premises during both site establishment and site operation; and
- c) provides a description of any noise mitigation measure considered necessary for the proposed activities to comply with the guidelines contained in Chapters 19, 20 and 21 of the EPA's Environmental Noise Control Manual.

# **Statutory Requirements**

The proposed activity would be currently scheduled by:

- 1) The Noise Control Act if the area available for extraction exceeds 20,000 square metres; and
- 2) The Clean Air Act if the sand is to be processed on the site.

However, you should be aware that the Protection of the Environment Operations (POEO) Act will be implemented from 1 September 1998. The POEO Act will bring key pollution control statutes under a single Act, including the Clean Air and Noise Control Acts. As a current licence holder, Dixon Sands (Penrith) Pty Ltd will soon receive a document from the EPA outlining the new schedule to the POEO Act, and new licence reuqirements. Should the company still require a licence under this new schedule to the POEO Act then the existing licence will become a POEO Act licence as of 1 September 1998.

While the EPA would prefer the system to be operated as a closed water system, we recognise that a discharge from the site will occur in circumstances where a rainfall event exceeds the design capacity of the surface water management system. It is likely that such a discharge would contain sediment and turbidity and we therefore recommend that the proponent also seek a water component to the licence for such a discharge.

Please also note that Pollution Control Approval will not be required under the POEO Act, as appropriate conditions for site establishment and installation of pollution control measures will be regulated by licence conditions.

The EPA welcomes the opportunity to provide comment on the scope and content of the EIS for the proposed sand extraction operation at Maroota. We look forward to reviewing the EIS upon completion.

If you require any further information in respect of this matter please contact Rod Aubrey on 0247 213 700 or Tim Gilbert on (02) 9795 5161.

Yours sincerely

Tim Collect 20/5/98
TIM GILBERT

Acting Principal Officer Sydney Industry

for **Director-General** 

Our Reference:

31.5314

Mr Ravi Ravendra

Telephone:

9672 2540

Thursday 14 May 1998

1 8 MAY 1998

Roads and Traffic Authority Sydney Region



Better Roads. Safer Roads. Saving Lives.

> 83 Flushcombe Road Blacktown NSW 2148 Telephone (02) 9831 0911 Facsimile (02) 9831 0926 PO Box 558 Blacktown NSW 2148 DX 8170

Lyall & Macoun Consulting Engineers P O Box 5215 Chatswood 2057

Attention: Mr.T.W.Macoun

Dear Sir,

# Dixon Sands (Penrith) Pty Ltd, Part Portion 196 and Portion 29 Maroota, NSW. Continuing Quarrying and Processing Operations

Further to your letter of 6 May 1998 requesting the RTAs comments on issues for inclusion in an EIS for the abovementioned facility.

The Roads and Traffic Authority would like to see the EIS address the following matters:

- 1. the proposed means of access to/from the site;
- 2. likely daily traffic movements generated by the development;
- 3. an assessment of the likely impact of truck traffic upon nearby residential areas;
- 4. details of the anticipated route of trucks through the metropolitan road network; and

Please refer further queries to Rave Ravendra on 02 9672 2540.

Yours faithfully

Philip Brogan

Land Use/Transport Manager

**Sydney Development Services Branch** 



# Baulkham Hills Shire Council

Fax: (02) 9 Dx 8455 Castle Hill

Administration Centre, 129 Showground Road, Castle Hill, N.S.W. 2154

Please address all correspondence to the General Manager PO Box 75, Castle Hill N.S.W. 2154

Office hours: Monday - Friday 8.30am - 4.30pm

7 May 1998

Mr T Macoun
Layll & Macoun Consulting Engineers R E Our Ref: OW560
Our Ref: P 152
P O Box 5215
WETS CHATSWOOD, NSW, 2057. - 8 MAY 1998

Dear Mr Macoun,

Dixon Sands (Maroota Operations)

Proposed Application - Request for Director General's Requirements.

I refer to your letter dated 28 April 1998 in regard to the abovementioned matter and wish to provide the following response:-

- Mr Peter Zadeian of Council Planning Services will attend the Pre-focus meeting:
- It is suggested that members from local community groups, such as the Maroota Planning Group also be invited to attend and contribute to discussions;
- It is also suggested that representatives from the RTA, Dept. School Education, HNCMT, Cattai CMC and Hornsby Shire Council be invited to attend;
- The application should include a separate assessment of all requirements of:-
  - Section 90 of the E P & A Act, 1979;
  - Schedules 2 & 3 of the Environmental Planning & Assessment Regulations, 1994;
  - SREP No.9(2)(Amendment No.1 1997) Extractive Industries:
  - SREP No.20(No.2 1997) Hawkesbury Nepean River, and
  - Baulkham Hills LEP 1991.
- The application is expected to include an assessment of all requirements of Council's DCP No.500 Extractive Industries and in particular the following matters:-
  - Section 2.1 Community Participation;
  - Section 2.11 Extraction Program Planning;
  - Section 2.12 Rehabilitation;
  - Section 2.15 Post Extraction Land uses;
  - Section 2.16 Maroota;
  - Section 2.18 Environmental Management Systems; and
  - Attachment No.1 How to Prepare a DA.

For any further enquiries please contact Mr Peter Zadeian on telephone 9843 0279.

Yours faithfully

Patrick Hurley

MANAGER - DEVELOPMENT CONTROL.

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