# ANNUAL ENVIRONMENTAL MANAGEMENT REPORT (AEMR) FOR THE KARUAH HARD ROCK QUARRY, KARUAH, NSW.

## *AEMR Period –*

## *16 January, 2018 – 15 January, 2019*

***Prepared by Hunter Quarries Pty Ltd***

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# ABBREVIATIONS

| | |
|---|---|
| **AEMR** | Annual Environmental Management Report |
| **AQMP** | Air Quality Monitoring Program |
| **CCC** | Community Consultative Committee |
| **DA** | Development Application |
| **DDG** | Dust Deposition Gauge |
| **DIPNR** | Former Department of Infrastructure Planning and Natural Resources (now DPE) |
| **DPE** | NSW Department of Planning and Environment |
| **EA** | Environmental Assessment |
| **EIS** | Environmental Impact Statement |
| **EMP** | Environmental Monitoring Program |
| **EMS** | Environmental Management Strategy |
| **EPL** | Environment Protection Licence |
| **GLC** | Great Lakes Council |
| **Ha** | Hectare |
| **HQPL** | Hunter Quarries Pty Ltd |
| **km** | Kilometre |
| **L** | Litre |
| **LDP** | Licenced Discharge Point |
| **OEH** | Office of Environment and Heritage |
| **POEO Act** | Protection of the Environment Operations Act 1997 |
| **NPWS** | NSW National Parks and Wildlife Service, now part of OEH |
| **RFS** | NSW Rural Fire Service |
| **SLR** | SLR Consulting Australia Pty Ltd |
| **SWMP** | Site Water Management Plan |
| **tpa** | tonnes per annum |

# i PURPOSE OF THE REPORT

*Hunter Quarries Pty Ltd (HQPL) has prepared this report which fulfils the Annual Environmental Management Report (AEMR) requirement of the Development Consent (DA 265-10-2004), Schedule 4 Condition 5. However, this AEMR has been prepared generally in accordance with the Department of Planning and Environment (DPE) 2015 Annual Review Guidelines. As such, HQPL acknowledges that while this document is an AEMR as required by the Development Consent, it has been prepared to be consistent with the format of an Annual Review.*

*This AEMR serves to cover the reporting period from the **16 January 2018 to 15 January 2019**.*

*This report provides specific detail on the project including a summary of environmental monitoring data and environmental performance during the reporting period. All environmental data in full can be supplied at request.*

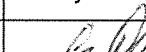
| | |
|---|---|
| **Name of Operation** | Karuah Hardrock Quarry |
| **Name of Operator** | Hunter Quarries Pty Ltd |
| **Development Consent / Project Approval #** | DA 265-10-2004 |
| **Name of holder of Development Consent / Project Approval** | Hunter Quarries Pty Ltd |
| **Mining Lease #** | None |
| **Water Licences** | None |
| **AEMR start date** | 16 January 2018 |
| **AEMR end date** | 15 January 2019 |

**I, Greg Dressler, certify that this AEMR is a true and accurate record of the compliance status of Karuah Hardrock Quarry for the period 16 January 2018 to 15 January 2019 and that I am authorised to make this statement on behalf of Hunter Quarries Pty Ltd.**

*Note.*

*a) The AEMR is an 'environmental audit' for the purposes of section 122B(2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, $1 million and for an individual, $250,000.*

*b) The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement—maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or*

| | |
|---|---|
| **Name of authorised reporting officer** | Greg Dressler |
| **Title of authorised reporting officer** | Quarry Manager |
| **Signature of authorised reporting officer** |  |
| **Date** | 26/3/19. |

# 1.0 STATEMENT OF COMPLIANCE

**Tables 1 - 3** outline the compliance status of the quarry operations at the end of the reporting period within the relevant approval conditions.

**Table 1 Statement of Compliance**

| Were all conditions of the relevant approval(s) complied with? | |
|---|---|
| Environment Protection Licence (No. 11569). | YES |
| Development Consent (DA265-10-2004) | YES |

**Table 2 DPE Compliance Status Key**

| Risk level | Colour code | Description |
|---|---|---|
| **High** | Non-Compliant | Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence |
| **Medium** | Non-Compliant | Non-compliance with:<br>• potential for serious environmental consequences, but is unlikely to occur; or<br>• potential for moderate environmental consequences, but is likely to occur |
| **Low** | Non-Compliant | Non-compliance with:<br>• potential for moderate environmental consequences, but is unlikely to occur; or<br>• potential for low environmental consequences, but is likely to occur |
| **Admin NC** | Non-Compliant | Only to be applied where the non-compliance does not result in any risk of environmental harm (e.g. submitting a report to government later than required under approval conditions) |

**Table 3 Non- Compliance**

| Relevant Approval | Condition # | Condition Description (Summary) | Compliance Status | Site Comment | Where Addressed in AEMR |
|---|---|---|---|---|---|
| DA265-10-2004 | Nil | eg. Operating hours | Compliant | | |
| EPL 11569 | Nil | eg. Rehabilitation | Compliant | | |

# 2.0 INTRODUCTION

This Annual Environmental Management Report (AEMR) provides detail on the reporting period from the ***16 January 2018 to 15 January 2019.*** The AEMR period covers the same period as the Environment Protection Licence (EPL) Annual Return period.

## 2.1 Project Overview

The Great Lakes Council (GLC) granted conditional Development Consent for a hard rock quarry and crushing plant at Karuah on 3 December 1997. Hunter Quarries Pty Limited (HQPL) purchased the site from Mountain Industries in 2002 and has since operated a hard rock quarry at the site, known as Karuah Quarry. The material extracted at the quarry is known as 'andesite' and is a hard, blue rock used for various purposes such as road base material, construction aggregate, aggregate used for concrete batching, drainage works, fill, landscaping and other uses.

The site is contained wholly within the Great Lakes Local Government Area and is located adjacent to Karuah Red Quarry and the Pacific Highway. It is approximately 4 kilometres (km) north of Karuah.

Development Consent (DA 265 – 10 – 2004) for the quarry's proposed expansion was granted on the 3 June 2005 by the former Minister for Infrastructure, Planning and Natural Resources. **Figure 1** shows the location of the site including Lot 21 DP 1024341, Lot 11 DP 1024564 and part of Lot 12 DP 1024564. Quarrying activities are undertaken on Lot 21 and Lot 11.

A 16 hectare (ha) conservation offset area was established on a southern portion of Lot 12.

Production at the Karuah Quarry continued during the Annual Review period.


**Figure 1 Karuah Hard Rock Quarry – Disturbance and Rehabilitation**

# 3.0 APPROVALS

HQPL is required to hold relevant approvals for the quarrying operation and these are detailed in **Table 4**.

**Table 4 Current Consents and Licences**

| Instrument | Date of Issue | Date of Expiration | Comments |
|---|---|---|---|
| Environment Protection Licence (No. 11569). | 30 June 2005 | N/A | The EPL is a requirement of *the Protection of the Environment Operations Act* (PoEO Act) *1997*. |
| Development Consent (DA265-10-2004) | 3 June 2005 | 3 June 2027 | DA 265-10-2004 will lapse 22 years after the approval date 03 June 2005. |

HQPL has an Environment Protection Licence 11569 (EPL 11569) which covers its activities at Karuah Quarry. **Table 5** outlines the licensing limits for production and material handling.

**Table 5 EPL Fee-Based Activity**

| EPL Fee-based Activity | Current Scale (tpa) |
|---|---|
| Crushing, Grinding or Separating | > 100,000 – 500,000 t processed |
| Land-based extractive activity | > 100,000 – 500,000 t obtained |

## 3.1 Consent Conditions for Reporting in the AEMR

**Table 6** details the relevant conditions in Development Consent (DA 265-10-2004) that must be reported annually in the AEMR, and the respective section(s) in this document where these consent conditions are addressed.

**Table 6 Checklist for AEMR Reporting**

| Condition Number | Condition Requirement for AEMR | Document Section |
|---|---|---|
| **Schedule 3 Condition 23** | *The Applicant shall include a progress report on the implementation and performance of the Flora and Fauna Management Plan and the Conservation Offset Strategy in the AEMR.* | *Section 6.5* |
| **Schedule 3 Condition 29 (c)** | *The Applicant shall include a progress report on the re-vegetation and maintenance of the visual bund in the AEMR, to the satisfaction of the Director General.* | *Section 8.1* |
| **Schedule 3 Condition 34 (d)** | *The Applicant shall report on waste management and minimisation in the AEMR to the satisfaction of the Director-General.* | *Section 6.7* |
| **Schedule 3 Condition 37 (b)** | *The Applicant shall include a copy of this (production) data in the AEMR.* | *Section 4.1* |
| **Schedule 3 Condition 41** | *The Applicant shall include a progress report on the Rehabilitation Management Plan in the AEMR.* | *Section 8* |
| **Schedule 4 Condition 5** | *The Applicant shall prepare and submit an AEMR to the Director-General and the relevant agencies. This report must address:*<br>*a) identify the standards and performance measures that apply to the development;* | *Section 3 and 6* |
| | *b) describe the works carried out in the last 12 months;* | *Section 4* |
| | *c) describe the works that will be carried out in the next 12 months;* | *Section 4.2* |
| | *d) include a summary of the complaints received during the past year, and compare this to the complaints received in previous years;* | *Section 9.3* |
| | *e) include a summary of the monitoring results for the development during the past year;* | *Section 8* |
| | *f) include an analysis of these monitoring results against the relevant:*<br>• *impact assessment criteria;*<br>• *monitoring results from previous years;*<br>• *predictions in the EIS;* | *Section 6* |
| | *g) identify any trends in the monitoring results over the life of the development;* | *Section 6* |
| | *h) identify any non-compliance during the previous year; and* | *Section 11.2* |
| | *i) describe what actions were, or are being taken to ensure compliance.* | *Section 11* |

## 3.2 Department of Planning and Environment Feedback (2016 AEMR)

The Department of Planning and Environment (DPE) provided feedback to HQPL in the letter dated 4 May 2018 requesting some additional information for this AEMR. Table 7 outlines where this information has been covered.

**Table 7 DPE Feedback on 2017 AEMR**

| Aspect | Document Section |
|---|---|
| Section 9.3 Complaints - In accordance with Section 9 of the Guidelines, please provide approved communication strategy as described in section 4.14.2 of the Karuah Hard Rock Quarry Environmental Management Strategy (EMS) dated March 2016. Copies of the six – monthly report provided to the Mid-Coast Council and residents may be included as an appendix. | Not completed. To be completed in 2019 or included in the Karuah East CCC. |
| Section 9.3 Community Complaints - please include a brief discussion on complaints trends for the reporting period compared to the previous reporting periods. This may be presented as a graph. | See Section 9.3 for complaints management. |

The DPE approved the 2017 AEMR in a letter dated 4 May 2018.

# 4.0 OPERATIONS SUMMARY

The following section briefly describes the general operation and environmental performance of the Karuah Quarry operations during this AEMR period. Quarry operations continued within the already approved quarry footprint.

## 4.1 Exploration

No exploration activities took place during this reporting period.

## 4.2 Land Preparation

During the reporting period minimal area cleared to the southern end of the extraction pit. Area 1 rehabilitation was also cleared. There is no planned additional clearing as part of the Karuah Quarry operation.

## 4.3 Construction Activities

There were no construction activities undertaken at HQPL during the AEMR period.

## 4.4 Quarry Operations

The current operations involve progressive drilling and blasting, which is followed by crushing and screening to produce the required materials. Some weathered material is extracted by ripping, which eliminates the need for blasting. The quarry currently produces a range of crushed natural rock product for use in landscaping, local road making and construction projects. Quarrying activities are allowed from 7am to 6pm Monday to Friday and from 7am to 1pm on Saturday. Maintenance activities are permitted 7 days a week between 7am to 6pm.

### 4.4.1 Equipment

During the reporting period the following equipment was utilised for the extraction of the hard rock material:

- Excavator x 3;
- Mobile crusher (screening and crushing equipment);
- Pegson 1000 Crusher;
- Front end loader x 5;
- 13,000 litre (L) water tanker; and
- Onsite Haul trucks x 4; and
- Road Grader.

### 4.4.2 Production of Material

This AEMR is required to report on the production operations of the quarry and these are summarised in **Table 8 Table 9.**

**Table 8 Monthly Production Summary (tonnes)**

| Month | Monthly total (tonnes) |
|---|---|
| January 16- January 31, 2018 | 16,702 |
| Feb-18 | 30,649 |
| Mar-18 | 36,208 |
| Apr-18 | 31,130 |
| May-18 | 41,339 |
| Jun-18 | 24,842 |
| Jul-18 | 33,037 |
| Aug-18 | 39,300 |
| Sep-18 | 42,684 |
| Oct-18 | 54,377 |
| Nov-18 | 55,951 |
| Dec-18 | 38,297 |
| January 1- January 15, 2019 | 14,544 |
| **Total production for the AEMR period** | **459,059** |

The site was below the production criteria in the Development Consent (limit 500,000 tonnes annually).

**Table 9 Production and Operations Summary**

| Material | Approved Limit (Specify Source) | Previous Reporting Period (actual) | This Reporting Period (actual) | Next Reporting Period (forecast) |
|---|---|---|---|---|
| Waste Rock/Overburden* | 0 | 0 | 0 | 0 |
| Rock Product | 500,000 tonnes (Schedule 1, DA 265-10-2004) | 498,752 | 459,059 | 490,000 |
| Saleable Product (Transported Offsite) | 500,000 tonnes (Schedule 1, DA 265-10-2004) | 498,752 | 459,059 | 490,000 |
| Hours of Operation | Monday – Friday 7am to 6pm<br>Saturday 7am to 1pm<br>Sunday and public holidays no work at any time<br>Minor maintenance works on plant and machinery may be carried out 7 days a week and public holidays 7am to 6pm<br>(Schedule 3, condition 2, DA 265-10-2004) | No change | No change | No change |

*"In the early stages of operation at Karuah Quarry, overburden was generated to enable the formation of the pit. No overburden was generated in the AEMR period with quarrying of 'hardrock' only.*

**Table 10** outlines production since 2005 at the Karuah Quarry.

**Table 10 Production and Operations Summary Since 2005**

| AEMR Period | Production (tonnes) |
|---|---|
| 1 January, 2005 – 31July, 2006 (19 month period) | 595,898 |
| 1 August, 2006 – 31 July 2007 | 338,528 |
| 1 August, 2007 – 31 July 2008 | 494,117 |
| 1 August, 2008 – 31 July 2009 | 779,006 |
| 1 August, 2008 – 31 July 2009 | 460,294 |
| 1 August, 2010 to 15 January, 2012 (16 month period) | 637,234 |
| 16 January, 2012 to 15 January, 2013 | 460,148 |
| 16 January, 2013 to 15 January, 2014 | 458,040 |
| 16 January, 2014 to 15 January, 2015 | 442,831 |
| 16 January, 2015 to 15 January, 2016 | 412,779 |
| 16 January, 2016 to 15 January, 2017 | 497,077 |
| 16 January, 2017 to 15 January, 2018 | 498,752 |
| 16 January, 2018 to 15 January, 2019 | 459,059 |

Note, in the past there were two occasions where the AEMR period changed at the Karuah Quarry based on consultation with the DPE. Since 2012 the period has been January 16 – January 15. The date of the Development Consent (265-10-2004) is from 3 June 2005 and the period of the consent is until 3 June 2027. The Development Consent (Schedule 2 Condition 7) states there is a total production limit 11.2 million tonnes of andesite from the site within the period of this consent.

Since the start of 2005 until 15 January 2019 the quarry has produced 6,533,763 tonnes which is well within the overall extraction limit.

## 4.5 Water Management

Surface water at Karuah Quarry is managed in accordance with HQPL Surface Water Management Plan (SWMP).

The principal objective of surface water management for the quarry is to ensure that there is no uncontrolled discharge of water from the site and that the water quality leaving the site meets the appropriate quality standards. This objective is intrinsic to erosion and sedimentation designs and controls for the quarry. As such, the following specific objectives of this SWMP have been established:

- Conducting best practice land clearing procedures for all proposed disturbance areas;
- Separating *undisturbed* runoff from *disturbed* runoff where possible to minimise and isolate the amount of disturbed or “dirty water” runoff;
- Directing sediment-laden runoff into designated sediment control dams;
- Diverting clean runoff from areas upstream of the operation into natural depressions and creeks;
- Constructing the haul road and working pit face with effective surface drainage thereby reducing roadside erosion and sedimentation;
- Allowing sediments to settle in sediment control dams so that the water can be re-used for on-site dust suppression, thereby maintaining dam capacities for subsequent rainfall events;
- Maintaining sediment control structures to ensure that the designed capacities are maintained for optimum settling of sediments;
- Directing runoff to the rubble drain near Area 2;
- Implementing an effective revegetation and maintenance program for the site.

Key water management features are outlined in **Appendix 3**.

Water Management is discussed further in **Section 7.0.**

## 4.6 Rehabilitation during the Reporting Period

There was no new rehabilitation during the reporting period.

Rehabilitation performance is discussed in **Section 8.0**.

## 4.7 Next Reporting Period

**Table 11** outlines forecast operations for the next reporting period.

**Table 11 Forecast Operations for Next Reporting Period**

| Operational Area | Forecast for Next Reporting Period |
|---|---|
| Pit expansion areas | No proposed changes. Operations continuing during the next reporting period within the existing disturbance footprint. |
| Infrastructure Development/Upgrades | No proposed changes to infrastructure or development. |
| Quarry Fleet Upgrades | New Front-End Loader and Haul Truck to be purchased to replace existing fleet. |

# 5.0 ACTIONS REQUIRED FROM PREVIOUS AEMR

The previous AEMR was submitted in March 2018, and the site received an approval letter on 4 May 2018.

The actions required as an outcome of the previous AEMR, including any actions that have been undertaken and when the actions were completed are provided in **Table 12.**

**Table 12 Actions Required from Previous AEMR**

| Action Required from Previous AEMR | Action Taken by the Operator | Where Discussed in the AEMR |
|---|---|---|
| **DPE** | | |
| Updates required for 2018 AEMR. | See **Table 7**. | |
| **Proposed Actions by HQPL** | | |
| Continue to update the website with monitoring data and key environment and community information. | Continued | Section 9 |
| Continue weed reduction program (target rehabilitation and conservation areas). | Weed management continued during the reporting period, including targeting spraying. | Section 6.5 |
| Remain within licensing and production limits. | Within limits | Section 3 |
| Continuation of community support program. | Continued | Section 9 |
| Preparation of a Conceptual Rehabilitation and Closure Plan for DPE approval | Draft completed and DPE has provided comments. To be finalised in Quarter 2. | Section 8 |

# 6.0 ENVIRONMENTAL PERFORMANCE

## 6.1 Meteorological Monitoring

Schedule 3 Condition 16 of the Development Consent (DA265-10-2004) requires HQPL to *"ensure that there is a suitable meteorological station operating in the vicinity of the development"*.

A new meteorological station was installed in August 2016 which is used by both the Karuah Quarry and Karuah East Quarry. The location of the station is shown in **Appendix 4**. **Table 13** presents a summary of the meteorological data collected by HQPL during the AEMR reporting period.

**Table 13 AEMR Meteorological Data**

| Month | Temp (C°) | | | Rainfall | | | Wind |
|---|---|---|---|---|---|---|---|
| | Average (C°) | Min Temp (C°) | Max Temp (C°) | Total (mm) | Max Daily (mm) | No rain days > 1 mm | Max Wind Gust (km/h) |
| Jan-18 (16th - 31st) | 24.4 | 11.3 | 39.0 | 3.4 | 3.2 | 1 | 50 |
| Feb-18 | 23.0 | 12.4 | 37.7 | 131.0 | 61.8 | 9 | 49 |
| Mar-18 | 22.3 | 10.5 | 38.8 | 152.0 | 72.2 | 10 | 52 |
| Apr-18 | 19.7 | 11.0 | 33.7 | 94.5 | 27.2 | 10 | 52 |
| May-18 | 14.0 | 4.6 | 26.4 | 46.2 | 38.8 | 4 | 52 |
| Jun-18 | 11.3 | 3.6 | 20.5 | 266.0 | 53.0 | 15 | 57 |
| Jul-18 | 10.7 | -0.5 | 23.6 | 8.8 | 4.0 | 2 | 59 |
| Aug-18 | 11.6 | 1.0 | 25.1 | 15.4 | 10.0 | 2 | 53 |
| Sep-18 | 14.6 | 4.2 | 32.5 | 92.8 | 30.2 | 10 | 56 |
| Oct-18 | 17.9 | 6.5 | 32.2 | 124.4 | 33.2 | 9 | 47 |
| Nov-18 | 20.4 | 9.4 | 37.0 | 74.0 | 31.2 | 4 | 70 |
| Dec-18 | 23.5 | 12.1 | 38.7 | 88.0 | 31.6 | 8 | 53 |
| Jan-19 (1st – 15th) | 25.8 | 17.1 | 41.1 | 20.4 | 11.0 | 4 | 50 |

In summary:

- Total rainfall: 1116.8mm (represents a slight increase since previous period);
- Monthly rainfall average: 86mm;
- Number of rainy days >1mm: 88 days
- Highest temperature: 41.1 C;
- Lowest temperature: - 0.5 C; and
- Average temperature: 18.4 C.

## 6.2 Noise

### 6.2.1 EIS Predictions

The 2004 EIS noted that operational noise levels are predicted to meet project specific noise goals at all nearest, potentially affected non-project related residential locations surrounding the site. The 2004 EIS predicted that there would be no increase in road traffic noise levels due to quarry contributed traffic discernible at any residential location adjacent to the Highway.

### 6.2.2 Approved Criteria

Approved noise criteria from the Development Consent are outlined in **Table 14.**

**Table 14 Noise Criteria for Karuah Quarry**

| Time Period | Noise Limit (dBA) – Laeq (15minute) |
|---|---|
| Day<br>7:00am to 6:00pm Monday to Friday<br>7:00am to 1:00pm Saturday | 48 |
| Evening<br>6:00pm to 10:00pm Monday to Friday | 47 |
| At All Other Times | 46 |

### 6.2.3 Key Environmental Performance or Management Issues

In accordance with the Development Consent both operator attended and unattended noise monitoring has been conducted at the nearest residential receivers to the quarry during the reporting period.

Noise monitoring locations are shown in **Appendix 4**.

A summary of the results is provided in **Table 15 to 18**, with full copies of the noise monitoring reports appended to this AEMR in **Appendix 5**.

Ambient noise levels given in the tables include all noise sources such as traffic, insects, birds and quarry operations. The noise reports and monitoring tables below provide further details on the following information:

- Monitoring location and serial number of the noise logger;
- Date, start time, Wind velocity (m/s) and Temperature (ºC) at the measurement location; and
- Typical maximum (LAmax) and contributed noise levels.

Quarry contributions listed in the tables are from Karuah Quarry and are stated only when a contribution could be quantified.

## May 2018 Noise Monitoring

**Table 15 May 2018 Noise Monitoring Results – Attended**

| Location | Date/Start Time/ Weather | Primary Noise Descriptor (dBA re 20 μPa) | | | | | Description of Noise Emissions and Typical Maximum Noise Levels (dBA) |
|---|---|---|---|---|---|---|---|
| | | LAmax | LA1 | LA10 | LA90 | LAeq | |
| NM1<br>Lot 3 DP785172<br>Northern Boundary | 17/5/2018<br>11:18<br>Wind 1 m/s S<br>Temp 18°C | 75 | 72 | 67 | 57 | 64 | Pacific Highway ~ 50-75<br>Birdsong ~ 40-53<br>Quarry inaudible |
| | | Contribution not measurable above background noise. | | | | | |
| NM2<br>Lot 2 DP 785172<br>Northern Boundary | 17/5/2018<br>11:35<br>Wind 1 m/s SE<br>Temp 19°C | 72 | 69 | 63 | 53 | 56 | Pacific Highway ~ 55-70<br>Frogs ~ 46 - 48<br>Quarry inaudible |
| | | Contribution not measurable above background noise. | | | | | |
| NM3<br>Lot 22 DP 1024341<br>Northern Boundary | 17/5/2018<br>11:59<br>Wind 1 m/s SSE<br>Temp 19°C | 69 | 65 | 59 | 49 | 56 | Pacific Highway ~ 47-69<br>Local road traffic 58 – 61<br>Birdsong to 43 - 45<br>Quarry inaudible |
| | | Contribution not measurable above background noise. | | | | | |
| Location F<br>1714 Branch Lane, Karuah | 17/5/2018<br>12:22<br>Wind 1 m/s SSE<br>Temp 20°C | 78 | 62 | 53 | 43 | 53 | Pacific Highway ~ 46-55<br>Local road traffic ~ 60-78<br>Birds ~ 49-53<br>Quarry inaudible |
| | | Contribution of Karuah Quarry Operations ~ LAeq <30 dBA | | | | | |

**Table 16 May 2018 Noise Monitoring Results - Unattended**

| INP Period | LA1 | LA10 | LA90 | LAeq |
|---|---|---|---|---|
| **NM1** | | | | |
| Daytime during Operational Hours[1] | 73 | 69 | 56 | 65 |
| Daytime outside Operational Hours[2] | 74 | 70 | 58 | 66 |
| Evening[3] | 75 | 69 | 53 | 66 |
| Night[4] | 74 | 68 | 38 | 63 |
| **NM2** | | | | |
| Daytime during Operational Hours[1] | 68 | 63 | 51 | 60 |
| Daytime outside Operational Hours[2] | 68 | 63 | 51 | 50 |
| Evening[3] | 69 | 64 | 47 | 60 |
| Night[4] | 68 | 62 | 37 | 57 |
| **NM3** | | | | |
| Daytime during Operational Hours[1] | 66 | 62 | 50 | 61 |
| Daytime outside Operational Hours[2] | 66 | 62 | 53 | 59 |
| Evening[3] | 67 | 64 | 50 | 60 |
| Night[4] | 67 | 63 | 39 | 58 |

*Note:*
1. *Daytime - 7.00 am to 5.00 pm Monday to Friday, 8.00 am to 12.00 pm Saturday, not operations on Sunday*
2. *Daytime - 5.00 pm to 6.00 pm Monday to Friday, 12.00 pm to 6.00 pm Saturday, 8.00 am to 6.00 pm Sunday*
3. *Evening - 6.00 pm 10.00 pm*
4. *Night - 10.00 pm to 7.00 am pm Monday to Saturday, 10.00 pm to 8.00 am Sunday.*

Noise generated by traffic on the Pacific Highway and insect noise dominated ambient noise levels at noise monitoring locations NM1, NM2 and NM3. At Location F noise from the Pacific Highway and Branch Lane dominated ambient noise levels.

The quarry was inaudible and unmeasurable at NM1. NM2 and NM3 monitoring locations due to high background noise levels from traffic and nearby construction. However, the quarry operations were audible at Location F during lulls in ambient noise.

Results from the ambient unattended noise logger measurements conducted at three noise monitoring locations also indicate that the Karuah Quarry is not a major contributor to ambient noise levels at each of these locations.

**November 2018 Noise Monitoring**

**Table 17 November 2018 Noise Monitoring Results – Operator Attended**

| Location | Date/Start Time/ Weather | Primary Noise Descriptor (dBA re 20 μPa) | | | | | Description of Noise Emissions and Typical Maximum Noise Levels (dBA) |
|---|---|---|---|---|---|---|---|
| | | LAmax | LA1 | LA10 | LA90 | LAeq | |
| NM1<br>Lot 3 DP785172<br>Northern Boundary | 22/11/2018<br>7:00<br>Wind 1 m/s SSE<br>Temp 18°C | 77 | 76 | 70 | 56 | 67 | Pacific Highway ~ 50-77<br>Insects ~50-53<br>Birds ~45-55<br>Quarry inaudible |
| | | Contribution not measurable above background noise. | | | | | |
| NM2<br>Lot 2 DP 785172<br>Northern Boundary | 22/11/2018<br>7:23<br>Day<br>Wind 1 m/s SE<br>Temp 18°C | 72 | 69 | 56 | 53 | 61 | Pacific Highway ~ 53-72<br>Insects ~ 50-52<br>Birds ~58-62<br>Quarry inaudible |
| | | Contribution not measurable above background noise. | | | | | |
| NM3<br>Lot 22 DP 1024341<br>Northern Boundary | 22/11/2018<br>07:52<br>Wind 1. m/s SSW<br>Temp 21°C | 67 | 66 | 63 | 53 | 59 | Pacific Highway ~ 55-67<br>Insects ~ 53<br>Birds ~56-65<br>Quarry inaudible |
| | | Contribution not measurable above background noise. | | | | | |
| Location F<br>1714 Branch Lane, Karuah | 22/11/2018<br>08:59<br>Wind 2 m/s SSW<br>Temp 25°C | 84 | 69 | 47 | 40 | 57 | Local road traffic ~ 63-84<br>Pacific Highway ~ 38-40<br>Birds ~ 40-44<br>Quarry inaudible |
| | | Contribution not measurable above background noise. | | | | | |
| Project Site - weighbridge[1] | 22/11/2018<br>09:32<br>Wind 2 m/s SSE<br>Temp 25°C | 77 | 74 | 66 | 56 | 64 | Pacific Highway traffic ~ 55–58<br>Quarry Audible<br>Crushing plant ~ 50-52<br>Trucks at weighbridge ~ 62–68<br>Estimated LAeq(15minute) Contribution 62 dBA |

*1 Additional operator-attended site survey was added closer to the Project site due to road traffic noise from the Pacific Highway dominating the ambient noise levels at the monitoring locations.*

**Table 18 Unattended Continuous Monitoring Ambient Noise Level (November 2018)**

| INP Period | LA1 | LA10 | LA90 | LAeq |
|---|---|---|---|---|
| **NM1** | | | | |
| Daytime during Operational Hours[1] | 73 | 69 | 57 | 66 |
| Daytime outside Operational Hours[2] | 73 | 69 | 56 | 66 |
| Evening[3] | 75 | 69 | 52 | 65 |
| Night[4] | 74 | 68 | 42 | 64 |
| **NM2** | | | | |
| Daytime during Operational Hours[1] | 67 | 63 | 52 | 60 |
| Daytime outside Operational Hours[2] | 67 | 62 | 51 | 60 |
| Evening[3] | 68 | 63 | 47 | 59 |
| Night[4] | 68 | 63 | 38 | 58 |
| **NM3** | | | | |
| Daytime during Operational Hours[1] | 67 | 64 | 52 | 61 |
| Daytime outside Operational Hours[2] | 68 | 64 | 55 | 61 |
| Evening[3] | 68 | 64 | 53 | 60 |
| Night[4] | 68 | 64 | 52 | 63 |

*Note:*
1. *Daytime - 7.00 am to 5.00 pm Monday to Friday, 8.00 am to 12.00 pm Saturday, not operational on Sunday*
2. *Daytime - 5.00 pm to 6.00 pm Monday to Friday, 12.00 pm to 6.00 pm Saturday, 8.00 am to 6.00 pm Sunday*
3. *Evening - 6.00 pm 10.00 pm*
4. *Night - 10.00 pm to 7.00 am pm Monday to Saturday, 10.00 pm to 8.00 am Sunday.*

Operator-attended and unattended noise monitoring was conducted at the three (3) nearest residences to determine noise levels produced by Karuah Quarry operations. Due to road traffic noise from the Pacific Highway dominating the ambient noise levels at the monitoring locations, an additional operator-attended survey was conducted closer to the Project site at a weighbridge (**Table 17**).

The noise contribution of Karuah Quarry operations was found to be significantly lower than that from road traffic on the Pacific Highway during all operator-attended noise surveys. The noise compliance results indicate that compliance with the relevant consent conditions was likely achieved at all noise monitoring locations during the operator-attended survey.

Results from the unattended ambient noise measurements conducted at three (3) noise monitoring locations were also consistent with site observations which indicate that the Karuah Quarry is not a major contributor to ambient noise levels at each of these locations during the survey period.

### 6.2.4 Management Measures

The following objectives and management measures apply to noise management at Karuah Quarry:

- To reduce and/or control noise associated with the quarry operations; and
- To train all relevant personnel in methods to reduce/control noise.

### 6.2.5 Proposed Improvements to Management Measures

Noise monitoring indicates that the noise levels emitted by the site are below the requirements within the consent criteria. Noise monitoring will continue to be completed in the next AEMR period.

The effectiveness of existing noise mitigation controls will continue to be monitored by the Quarry Manager as part of the routine noise monitoring program and environmental inspections.

## 6.3 Blasting

### 6.3.1 EIS Predictions

The 2004 EIS predicted that air blast and ground vibration levels will meet the EPA Guidelines at all residential locations surrounding the development with appropriate maximum instantaneous charge (MIC) limits in place.

### 6.3.2 Approved Criteria

According to both the EPL 11569 and DA 265-10-2004, the overpressure level from blasting operations must not exceed 115 dB(L) for more than 5% of the total number of blasts, at any residences or nearby receiver, and must not exceed 120dB(L) at any time.

Ground vibration must not exceed 5mm/s for 5% of the total number of blasts over a period of 12 months and must not exceed 10mm/s at the nearby receiver.

### 6.3.3 Key Environmental Performance or Management Issues

During the reporting period all blasts were monitored at the blast monitoring locations shown in **Appendix 4**. Note that Monitor 1 is located at the front gate of the quarry and is for internal monitoring purposes only.

**Table 19** outlines the blast monitoring results at the Quarry during the AEMR period.

**Table 19 Blast Monitoring Results During the AEMR Period**

| DATE | Time of Blast | Monitor 2 – (Nearest Private Residence) | |
|---|---|---|---|
| | | Overpressure | Peak Particle |
| | | Level (dBL) | Velocity (mm/s) |
| 30/01/2018 | 2:13 pm | 100.0 | 1.33 |
| 30/01/2018 | 2:21 pm | 110.6 | 2.63 |
| 06/02/2018 | 12:28 pm | 104.9 | 0.50 |
| 06/03/2018 | 2:15 pm | 108.0 | 4.35 |
| 20/04/2018 | 12:46 pm | 109.5 | 2.83 |
| 18/05/2018 | 12:31 pm | 113.3 | 2.40 |
| 02/07/2018 | 12:30 pm | 109.9 | 2.81 |
| 18/07/2018 | 12:38 pm | 108.1 | 0.20 |
| 03/08/2018 | 12:29 pm | 101.9 | 1.32 |
| 21/08/2018 | 1:37 pm | 113.5 | 2.75 |
| 21/09/2018 | 12:29 pm | 107.5 | 1.16 |
| 08/10/2018 | 3:05 pm | 111.8 | 1.94 |
| 31/10/2018 | 11:11 pm | 111.2 | 0.83 |
| 19/11/2018 | 1:45 pm | 112.6 | 1.32 |
| 30/11/2018 | 11:44 am | 111.8 | 1.22 |
| 15/01/2019 | 12:29 pm | 113.1 | 1.24 |

**Table 20** provides a summary of the blasting results during the AEMR period.

**Table 20 Blast Monitoring Summary for AEMR Period**

| **Blast Monitoring Summary for AEMR Period** *(16 January 2018 – 15 January 2019)* | **Monitor 2 (Nearest Private Residence)** |
|---|---|
| Total No. of Blasts during reporting period | 16 |
| No. of Blast records collected – ie. Values registered | 16 |
| No. of Blasts with no results or no value registered. | 0 |
| No. of blasts exceeding 5 mm/s | 0 |
| No. of Blasts exceeding 115 dBL | 0 |
| Average PPV value (mm/s) | 1.8 |
| Highest PPV value (mm/s) | 4.35 |
| Lowest PPV value (mm/s) | 0.20 |
| Average overpressure value (dBL) | 109.2 |
| Highest overpressure value (dBL) | 113.5 |
| Lowest overpressure value (dBL) registered | 100.0 |

Blast monitoring trigger levels used at the Quarry are set at 88 dB(L) for overpressure and 0.5 mm/s for ground vibration. Therefore, any blasts not triggering the monitoring equipment are significantly below the required overpressure and ground vibration criteria.

During the AEMR period:

- No blasts exceeded 120 dBL; and
- No blast exceeded 115 dBL at the nearest residential dwelling or privately owned land; and
- No ground vibration peak particle velocity readings exceeding 5 mm/s.

Blasting results have been below approved criteria and EIS predictions.

### 6.3.4 Management Measures

The following control measures have been employed at the site:

- Considerations of explosive loading, initiation sequence and firing;
- Use of experienced blast contractors;
- Monitoring of meteorological conditions prior to blasting; and
- Notifying landowners (at their request) and occupiers of blast events.

Additionally, all blasting activities at Karuah Quarry are monitored by a licensed blasting contractor. Monitoring equipment is located at the front gate (monitor 1) to the quarry and at the nearest residence (Monitor 2).

### 6.3.5 Proposed Improvements to Management Measures

Blast monitoring will continue at both monitor 1 and 2 locations and report on all blasts within the AEMR.

No further improvements required.

## 6.4 Air Quality

### 6.4.1 EIS Predictions

The 2004 EIS for an Extension to the Karuah Quarry predicted that dust levels from the operation would be within the criteria of 4 g/m$^2$/month. HQPL can demonstrate that air quality monitoring through dust depositional monitoring after several years clearly shows the quarry is meeting air quality criteria.

### 6.4.2 Approved Criteria

All air quality monitoring conducted at the quarry during the reporting period was compared to criteria stipulated in Schedule 3 Consent Condition 13, of DA 265-10-2004 which apply at any privately owned residences, or on more than 25% of any privately owned land, and are as follows:

- Deposited dust annual average assessment criteria less than 4 g/m$^2$/month; and
- Deposited dust increase in deposited dust level of greater than 2 g/m$^2$/month.

There are no EPL criteria relating to dust levels at Karuah Quarry.

### 6.4.3 Key Environmental Performance or Management Issues

The principle source of air pollution at the quarry is in the form of airborne dust, which arises from activities such as quarrying, vehicle movements and crushing.

The results in **Tables 21** illustrate that all dust gauges were below the annual average assessment criteria of 4 g/m$^2$/month during the 2018 reporting period.

**Table 21 Depositional Dust Monitoring Summary (g/m$^2$/month)**

| Date on | Date off | DDG1 | DDG2 | DDG3 | DDG4 |
|---|---|---|---|---|---|
| 08-01-2018 | 05-02-2018 | 1.5 | 0.8 | 1.3 | 1.0 |
| 05-02-2018 | 05-03-2018 | 1.6 | 1.0 | 1.5 | 1.5 |
| 05-03-2018 | 03-04-2018 | 0.6 | 0.6 | 1.1 | 2.6 |
| 03-04-2018 | 01-05-2018 | 0.8 | 1.0 | 1.0 | 1.7 |
| 01-05-2018 | 30-05-2018 | 0.9 | 0.5 | 0.7 | 1.1 |
| 30-05-2018 | 27-06-2018 | 0.6 | 0.5 | 0.4 | 0.9 |
| 27-06-2018 | 26-07-2018 | 0.7 | 0.6 | 0.6 | 1.2 |
| 26-07-2018 | 23-08-2018 | 0.9 | 0.9 | 0.9 | 1.3 |
| 23-08-2018 | 20-09-2018 | 1.6 | 1.0 | 0.6 | 0.7 |
| 20-09-2018 | 26-10-2018 | 1.2 | 0.9 | 0.6 | 1.0 |
| 26-10-2018 | 23-11-2018 | 1.5 | 3.4 | 1.1 | 1.1 |
| 23-11-2018 | 21-12-2018 | 1.3 | 0.6 | 0.1 | 3.0 |
| **Annual Average** | | **1.1** | **0.9** | **0.9** | **1.3** |

**Table 22** shows long term dust monitoring results.

**Table 22 Long- term Depositional Dust Monitoring Summary**

| Dust Depositional Gauge | Monitoring Summary for AEMR period | Monitoring Results 2018 Period (g/m²/month) | Monitoring Results 2017 Period (g/m²/month) | Monitoring Results 2016 Period (g/m²/month) | Monitoring Results 2015 Period (g/m²/month) | Monitoring Results 2014 Period (g/m²/month) | Monitoring Results 2013 Period (g/m²/month) |
|---|---|---|---|---|---|---|---|
| **DDG 1** | Insoluble Solids Reporting Period Average | 1.1 | 0.9 | 1.9 | 1.5 | 1.2 | 1.7 |
| | Max. Insoluble Solids | 1.6 | 1.7 | 4.0 | 6.4 | 2.2 | 5.1 |
| | Min. Insoluble Solids | 0.6 | 0.4 | 0.4 | 0.3 | 0.5 | 0.5 |
| **DDG 2** | Insoluble Solids Reporting Period Average | 0.9 | 0.7 | 1.0 | 0.9 | 0.9 | 1.0 |
| | Max. Insoluble Solids | 3.4 | 1.8 | 3.0 | 3.7 | 2.2 | 1.8 |
| | Min. Insoluble Solids | 0.4 | 0.1 | 0.3 | 0.3 | 0.4 | 0.4 |
| **DDG 3** | Insoluble Solids Reporting Period Average | 0.9 | 0.9 | 0.7 | 0.6 | 0.8 | 1.0 |
| | Max. Insoluble Solids | 3.4 | 1.4 | 1.3 | 2.8 | 1.4 | 3.2 |
| | Min. Insoluble Solids | 0.4 | 0.5 | 0.3 | 0.1 | 0.3 | 0.2 |
| **DDG 4** | Insoluble Solids Reporting Period Average | 1.3 | 1.5 | 1.3 | 1.2 | 1.6 | 1.4 |
| | Max. Insoluble Solids | 3.0 | 3.8 | 3.2 | 4.1 | 7.1 | 9.5 |
| | Min. Insoluble Solids | 0.2 | 0.5 | 0.3 | 0.3 | 0.3 | 0.2 |

In summary:

- DDG1 – increase from 0.9 g/m²/month in 2017 to 1.1 g/m²/month in 2018. Within Development Consent criteria;
- DDG2 - increase from 0.7 g/m²/month in 2017 to 0.9 g/m²/month in 2018. Within Development Consent criteria;
- DDG3 – in 2017 and 2018 this gauge recorded 0.9 g/m²/month. Within Development Consent criteria; and
- DDG4 Decrease from 1.5 g/m²/month in 2017 to 1.3 g/m²/month in 2018. Within Development Consent criteria.

The longterm results indicates there has been little change between annual averages across the depositional dust gauges between 2013 and 2018. There appears to have been no cumulative impacts associated with the adjacent Karuah East operation.

### 6.4.4 Management Measures

The following management measures have been adopted at the site to control dust:

- Air quality monitoring;
- Minimising disturbance of land to only what is required by quarry activities;
- Minimising distance travelled by hauling rock the shortest distance possible;
- Utilising quarry runoff water for dust suppression on roads, stockpiles, production plant and work areas. A 13,000 litre (L) water cart is used at the site to assist with firefighting capabilities and dust management. Water is regularly collected from Sediment Dam 2 and sprayed on roads throughout the quarry to minimise dust generated from vehicle movements;
- Engaging the services of a contract road sweeper to regularly clean roadways around the entrance to the quarry; and
- Ensuring loads are covered when leaving the site.

### 6.4.5 Proposed Improvements to Management Measures

HQPL will continue to monitor air quality in accordance with the conditions of the Development Consent and will also review measures for improving dust management on site. Air quality monitoring during this reporting period demonstrates that air quality and dust levels are complying with the development consent criteria and the current OEH air quality goals, which are outlined in section 5.4 of the EIS (ADW, 2004).

## 6.5 Biodiversity

### 6.5.1 EIS Predictions

The 2004 Stage 2 EIS stated:
*The proposed extension will impact on four endangered species, one directly and the others indirectly. The impacts can be adequately mitigated to allow these species to continue to function unimpeded by the proposed extension. A conservation off-set of 16 hectares will be provided on adjacent land. The off-set will comprise similar habitat to that which will be disturbed by quarrying. The off-set will ensure an appropriate level of formal protection for threatened flora and fauna species in the long-term.*

### 6.5.2 Approved Criteria

There are no specific criteria associated with biodiversity management for the site. Activities need to be completed in accordance with the EIS.

### 6.5.3 Key Environmental Performance or Management Issues

HQPL implement a *Flora and Fauna Management Plan.* The key components and management measures of the *Flora and Fauna Management Plan* include:

- A vegetation clearing protocol;
- Flora and fauna monitoring;
- Topsoil management;
- *Conservation Offset Management Plan*; and
- *Remnant Vegetation Conservation Plan*.

**Flora and Fauna Monitoring**

There was no flora and fauna monitoring undertaken during 2018 at the Karuah Quarry. Ecological monitoring is undertaken annually in the Lot 12 offset area as part of the annual monitoring at the adjacent Karuah East Quarry. The results from the 2018 monitoring indicate that while some species are stressed from dry conditions, the vegetation and fauna habitats within the Karuah East Biodiversity Offset Area (BOA) and Lot 12 are in high condition and remain relatively unchanged since the baseline survey in 2015.

**Stock and Feral Animals**

A number of vertebrate pest species were identified in areas adjacent areas around the site for the Karuah East Project, including Feral Dog, Feral Rabbit, Feral Pig and Feral Cat; however, there was no evidence of disturbance from feral animals within the Lot 12 conservation area.

**Weeds**

The biodiversity monitoring and site inspections in previous reporting periods have identified *Lantana camara* (Lantana) as being the most widespread and abundant weed species across the site, including the conservation area. An intensive weed spraying regime across the Karuah Quarry and the adjacent Karuah East Quarry targeting the areas of Lantana was undertaken in 2018. Spraying at Karuah Quarry was undertaken on two occasions (autumn and spring) during the reporting period. Spraying was successful at reducing Lantana and will be continued in 2019.

### 6.5.4 Management Measures

Biodiversity impacts continue to be managed in accordance with the *Flora and Fauna Management Plan*.

**Long Term Security of the Conservation Offset Area**

Conditions 17 and 18 of the consent outline the requirements for the establishment and long term security of the conservation offset area on the southern portion of Lot 12 DP 1024564 (as shown in Appendix 2 of the consent). The proponent is in the process of preparing a caveat on the title of Lot 12 DP 1024564 in consultation with the NSW DPE. Following endorsement of the caveat by the Secretary (NSW DPE), the proponent will formalise the caveat with NSW Land and Property Information (NSW LPI). Whilst the caveat on title is not yet finalised, Hunter Quarries recognise the importance of maintaining and enhancing the conservation offset area and accordingly implements the Flora and Fauna Management Plan that includes a Management Plan for the Conservation Offset Area.

It is anticipated that the caveat will be progressed further with the NSW DPE over the next 12 months.

### 6.5.5 Proposed Improvements to Management Measures

HQPL has improved its weed spraying regime and will continue to undertake weed control measures particularly around haul roads and within rehabilitation areas, including along the edges in 2019.

Site inspections for the identification of noxious weeds will continue to be undertaken.

## 6.6 Heritage (Aboriginal and Non- Aboriginal)

### 6.6.1 EIS Predictions

The archaeological survey conducted for the EIS (ADW, 2004) process did not find any heritage items onsite. There were no predicted impacts to heritage from the Karuah Quarry.

### 6.6.2 Approved Criteria

There are no specific criteria associated with heritage relating to the project.

The process for managing any unexpected heritage items is outlined in **Section 6.6.4**.

### 6.6.3 Key Environmental Performance or Management Issues

There were no issues relating to Aboriginal and Cultural heritage during the reporting period.

### 6.6.4 Management Measures

Should unexpected Aboriginal objects/features be encountered, work must stop immediately and the area cordoned off with a high visibility barrier. The Quarry Manager is to then contact a heritage consultant and Registered Aboriginal Parties (RAPs). The heritage consultant, in consultation with the RAPs, is to conduct a field survey to assess the Aboriginal objects/features identified. The heritage consultant, in consultation with the RAPs, will then recommend appropriate mitigation measures.

The Quarry Manager is to implement the mitigation measures that are recommended by the heritage consultant and agreed to by the RAPs and in accordance with OEH regulations. If additional visual inspection and salvage is recommended, the Quarry Manager is to arrange for the heritage consultant and RAPs to undertake those works.

Provided that these heritage contingency protocols have been followed, works within the Project Area may proceed.

### 6.6.5 Proposed Improvements to Management Measures

As there have been no heritage items located to date, no improvements to management measures are proposed.

## 6.7 General Waste Management

### 6.7.1 Environmental Management

HQPL use a licensed contractor for waste removal at the site. Typical waste at the quarry generally consists of non- hazardous and general wastes, as well as oily wastes. The general and non- hazardous wastes are placed in a skip bin and removed from site.

Oily water accumulates in the workshop sump within a bunded area and is removed by a licenced contractor when the sump is full. Additionally, scrap steel and tyres are separated and stockpiled until there is enough quantity for removal by a licensed contractor for recycling.

### 6.7.2 Environmental Performance

JR Richards, a waste contractor, removes waste from a 3 metre cubed waste bin at the site. There were 26 collections during the reporting period, with capacity of the bin ranging from 50% to 100%. Over the year, approximately 71 cubic metres of waste was removed from the site, with this being a small increase compared to the previous period.

### 6.7.3 Proposed Improvements to Management Measures

HQPL will continue to effectively manage their waste on site, including continuing to reuse and recycle where possible.

## 6.8 Summary of Environmental Performance

**Table 23** provides a summary of the environmental performance at the site for the reporting period.

**Table 23 Environmental Performance**

| Aspect | Approval Criteria/EIS Prediction | Performance During the Operating Period | Trend/Key Management Implications | Implemented/Proposed Management Actions |
|---|---|---|---|---|
| Noise | See Section 6.2.1 | Compliant | Within criteria | Continued monitoring |
| Blasting | See Section 6.3.1 | Compliant | Within criteria | Continued monitoring |
| Air Quality | See Section 6.4.1 | Compliant | Within criteria | Continued monitoring |
| Biodiversity | See Section 6.5.1 | Compliant | No specific criteria | Continued management |
| Heritage | See Section 6.6.1 | Compliant | No specific criteria | No additional management proposed. |
| Waste | No predictions | Compliant | Minimal change over successive years. | Continued monitoring |

# 7.0 WATER MANAGEMENT

## 7.1 Summary of Water Management at Site

### 7.1.1 Environmental Management

Surface water at Karuah Quarry is managed in accordance with HQPL Surface Water Management Plan (SWMP). The primary objective of water management at the site is to remain compliant with EPL 11569. As such, water contained within the footprint of the development is directed to Sediment Dam 2. Where this is not possible, water is directed through sediment control structures such as silt fences and retention sumps. Key surface water management features are presented in **Appendix 3**.

***Water Storage and Use***

During this reporting period, water from Sediment Dam 2 has been used for the following:

- Dust suppression on internal access and haul roads; and
- Process water/dust suppression for the crusher, conveyors and stockpiles.

HQPL continued to record water usage during the reporting period.

The capacity of the dam is approximately 18 ML. During the reporting period the volume of water stored in Sediment Dam 2 ranged from 6 ML to just less than 18 ML.

### 7.1.2 Proposed Improvements to Management Measures

Sediment Dam 2 and other erosion and sediment control structures are regularly inspected. Additionally, surface water is pumped from Sediment Dam 2 to the smaller sediment dam to reduce the risk of overflow and discharge, and to reduce sediment load. In order to reduce the risk of water discharges, the level of Sediment Dam 2 is maintained at a low level.

### 7.1.3 Discharges

***Water Discharge Events***

There were no discharge events at Karuah Quarry (Sediment Dam 2) during the reporting period. In the event of a discharge, surface water parameters and volume are to be monitored in accordance with the conditions in the EPL. This includes monitoring water quality daily during discharge and sampling for pH and TSS at the licenced discharge point (LDP). During discharge events, water discharging from the site needs to be within the parameters outlined in Condition L2.4 of EPL 11569. The site has the ability to pump water back up into the pit area (unused section) to increase capacity.

### 7.1.4 Routines Monitoring

Although no discharge occurred, Karuah still sampled the Sediment Dam 2 twice during the 2018 reporting period. The results are presented in **Table 24**.

**Table 24 Surface Water Monitoring Results 2018**

| Date | EPL Criteria (For Discharge) | 20 May 2018 | 4 December 2018 |
|---|---|---|---|
| pH | 6.5 - 8.5 | 7.8 | 8.1 |
| EC (µS/cm) | - | 455 | 418 |
| TSS (mg/L) | 50 | 110 | 90 |
| Turbidity (NTU) | - | - | 380 |
| Oil and Grease (mg/L) | 5 or non - visible | - | - |
| Total Nitrogen | - | 0.7 | 1.5 |
| Total Phosphorus | - | 0.1 | 0.1 |

As evident, the parameters are within the pH criteria on both occasions. TSS was above criteria in May 2018 and December 2018; however, no discharge occurred so Karuah remains compliant with Condition L2.4 of EPL 11569. No results were obtained for oil and grease during the reporting period, but should discharge occur, Karuah will include this parameter.

## 7.2 Water Take

**Table 25** outlines the water take at Karuah Quarry for the reporting period.

**Table 25 Water Take**

| Water Licence Number | Water Sharing Plan, Source and Management Zone (as applicable) | Entitlement | Passive Take/Inflows | Active Pumping | TOTAL |
|---|---|---|---|---|---|
| Nil water licenses for Karuah Quarry | - | Nil | - | Nil | - |

## 7.3 Salinity Trading Scheme Credit Use

Not applicable to HQPL.

## 7.4 Compensatory Water to Other Users

Not applicable to HQPL.

# 8.0 REHABILITATION

There have been limited opportunities to establish rehabilitation at the quarry site, due to the configuration of the quarry and the progressive nature of the working areas. Once works have ceased at the quarry, rehabilitation will be undertaken and completed in accordance with the *Rehabilitation Management Plan*.

A *Conceptual Rehabilitation and Closure Management Plan* has been prepared for Karuah Quarry (not yet approved by DPE) which combines the requirements of Schedule 3 Condition 39 (Rehabilitation Management Plan) and Schedule 3 Condition 44 (Quarry Closure Plan) of DA 265-10-2004 into one document.

## 8.1 Rehabilitation Performance During Reporting Period

A summary of rehabilitation at Karuah Quarry is outlined in **Table 26.**

**Table 26 Summary of Rehabilitation Performance During Reporting Period**

| Guideline Requirement | Site Comment |
|---|---|
| Extent of the operations and rehabilitation at completion of the reporting period | Rehabilitation undertaken as per the annual rehabilitation inspection, which included an inspection of the visual bund. No rehabilitation was undertaken in the AEMR period. |
| Agreed post- rehabilitation land use | Woodland, with the pit area to be returned to a wetland post quarrying land use. |
| Key rehabilitation performance indicators | The *Rehabilitation Management Plan* includes completion criteria. |
| Renovation or removal of buildings | None during reporting period. |
| Any other Rehabilitation taken including:<br>• Exploration activities;<br>• Infrastructure;<br>• Dams; and<br>• The installation or maintenance of fences, bunds and any other works. | No rehabilitation undertaken during the AEMR period. |
| Any rehabilitation areas which have received formal sign off from the Resources Regulator | None. |
| Variations to activities undertaken to those proposed (including why there were variations and whether the Resources Regulator was notified) | No rehabilitation undertaken during the AEMR period. |
| Outcomes of trials, research projects and other initiatives | Key notes from the rehabilitation inspection are outlined in **Section 8.2**. |
| Key issues that may affect successful rehabilitation | Weed management is a continuous management issue for the site. |

## 8.2 Summary of Rehabilitation Inspection

Rehabilitation inspections are completed in Rehabilitation Area 1 annually. The inspection includes reviewing key features such as:

- Ground cover;
- Erosion;
- Overstorey, mid storey and lower storey;
- Nutrient cycling;
- Presence of mortality or die back; and
- Presence of weeds.

The location of Rehabilitation Area is shown in **Appendix 4**. There is now only one rehabilitation area at site. It was necessary in 2018 to remove one of the rehabilitation areas to allow safe access to a section of the pit.

The rehabilitation in Rehabilitation Area is mostly on rocky substrate with some soil. There is minimal erosion, with a good cover of acacias and some eucalypts have established. There is minimal ground cover in some areas; with evidence of weeds (mainly Lantana) mostly along the edge of the rehabilitation area. There is minimal change in groundcover and general conditioning from previous monitoring periods.

The rehabilitation area was subject to a weed spraying regime for Lantana in 2018. Spraying was successful at reducing Lantana and will be continued in 2019.

There appeared to be additional acacias that have fallen over in the rehabilitation areas since the previous rehabilitation inspection. This is a sign that the acacias are starting to thin out, with additional rehabilitation plantings required (likely eucalyptus species).

**Table 27** details the rehabilitation status by year in accordance with the key rehabilitation performance indicators.

**Table 27 Rehabilitation Status**

| Quarry Area Type | Previous Reporting Period (Actual) | This Reporting Period (Actual) | Next Reporting Period (Forecast) |
|---|---|---|---|
| | Previous AEMR Period (ha) | Current AEMR Period (ha) | Next AEMR Period (ha) |
| A. Total Quarry Footprint (including access road in) | 25.6 ha | 28.8 ha | 28.8 ha |
| B. Total Active Disturbance | 22.8 ha | 25.9 ha | 25.9 ha |
| C. Land Being Prepared for Rehabilitation | 0 | 0 | 0 |
| D. Land Under Active Rehabilitation | 1.7 ha | 1.8 ha* | 1.8 ha |
| E. Completed Rehabilitation | 0 | 0 | 0 |
| F. Remnant Bushland within Disturbance Footprint | 1.1 | 1.1 | 1.1 |

*A review of disturbance and rehabilitation areas was completed in 2019. An area previously classified as bushland on the edge of a rehabilitation area has been reclassified as rehabilitation. The disturbance and rehabilitation will continue to be reviewed annually based on up to date aerial imagery.

There was no new rehabilitation during the reporting period.

**Photo 1 –Eucalypts are growing within the rehabilitation area**

**Photo 2: Reduction in weeds within the rehabilitation area due to weed spraying regime in 2018**

## 8.3 Actions for the next Reporting Period

The DPE 2015 Annual Review Guidelines require the AEMR to outline the rehabilitation actions proposed during the next reporting period. These actions are detailed in **Table 28**.

**Table 28 Actions for the Next Reporting Period**

| Requirement | Site Comment |
|---|---|
| Describe the steps to be undertaken to progress agreement during next reporting period, where final rehabilitation outcomes have not yet been agreed between stakeholders | There is no planned additional rehabilitation at the site in the next AEMR period. |
| Outline proposed rehabilitation trials, research projects and other initiatives to be undertaken during next reporting period | There is a proposed rehabilitation trial on the northern faces of the quarry. The current rehabilitation areas will continue to be inspected and managed as required. |
| Summary of rehabilitation activities proposed for next report period | There is no planned additional rehabilitation at the site in the next AEMR period. |

# 9.0 COMMUNITY

## 9.1 Community Engagement Activities

In both 2007 and 2011, HQPL sent flyers to nearby neighbours and advertised for expressions of interest for a Community Consultative Committee (CCC).

There is currently no specific CCC for Karuah Quarry, however a CCC meeting is held quarterly for the adjacent Karuah East Quarry were community members are able to discuss Karuah Quarry if required.

## 9.2 Community Contributions

HQPL feels strongly about supporting the local community and has a long history of community contributions. They are the proud supporters of various local and regional community groups and charities.

Additional information regarding community contributions can be found on the HQPL website at http://hunterquarries.com.au/community/.

## 9.3 Complaints

No complaints have been received at Karuah Quarry from 2012 to 2016, with one complaint related to noise received in 2017.

One complaint was received during the 2018 reporting period. This complaint was received from a local resident on 7 December 2018 relating to dust. The complainant observed excessive dust as they were driving past the Quarry.

Dust levels at Karuah Quarry are typically higher in the morning when crushing equipment is initially started for the day. The complainant observed high dust levels at 9.30 am suggesting they noted typically higher levels than usual. Karuah Quarry reduced dust levels following the complaint by using water sprays on the crusher and water trucks.

When a complaint is received, it is logged and investigated by the Quarry Manager. Feedback is then provided to the complainant and government agencies, as required. This process forms a part of the Karuah Quarry Environmental Management Strategy (EMS).

A telephone number has been established for the purpose of receiving complaints and enquiries from the community and this number is available on the HQPL website (www.hunterquarries.com.au) and is provided on a sign at the entrance to the quarry. The community can contact the quarry on **(02) 4997 5966** as well as through the HQPL website.

# 10.0 INDEPENDENT AUDIT

There is a requirement for Independent Environmental Audits at Karuah Quarry as per Schedule 4 Condition 6 of the Development Consent.

*Within 2 years of the date of this consent, and every 5 years thereafter, unless the Director-General directs otherwise, the Applicant shall commission and pay the full cost of an Independent Environmental Audit of the development.*

The previous audit was undertaken in July 2014. The next audit is due in July 2019.

# 11.0 INCIDENTS AND NON-COMPLIANCES DURING THE REPORTING PERIOD

## 11.1 Summary of Incidents

There were no reportable incidents during the 2018 reporting period.

## 11.2 Summary of Non-Compliances

There were no non-compliances during the reporting period.

# 12.0 ACTIVITIES TO BE COMPLETED IN THE NEXT REPORTING PERIOD

**Table 29** outlines the proposed actions in the next AEMR.

**Table 29 Proposed Actions in the Next AEMR**

| Proposed Action | Timeline | Management Plan Requires Revision (Y/N) |
|---|---|---|
| Continue to update the website with monitoring data and key environment and community information. | Continuous | No |
| Continue weed reduction program (target rehabilitation and conservation areas). | Continuous as required. | No |
| Remain within licensing and production limits. | Continuous | No |
| Continuation of community support program. | Continuous | No |
| Completion of Community Engagement Strategy | Quarter 2 2019 | No |

# 13.0 REFERENCES

The following documents and reports have been used to assist in writing the quarry's AEMR:

DoP (2005) *Development Consent DA265-10-2004*.

DEC-EPA, (2002) *Environment Protection Licence 111569*.

Asquith & deWitt (ADW) (2004) *Environmental Impact Statement: Proposed Hard Rock Quarry Extension*.

SLR Consulting (2018) *Karuah Quarry Biannual Noise Monitoring Assessment May 2018*

SLR Consulting (2018) *Karuah Quarry Biannual Noise Monitoring Assessment November 2018*

SLR Consulting (2015 Review) *Environmental Management Strategy*

SLR Consulting (2015 Review) *Environmental Monitoring Plan*

SLR Consulting (2015 Review) *Rehabilitation Management Plan*

SLR Consulting (2015 Review) *Bushfire Management Plan*

SLR Consulting (2015 Review) Site *Water Management Plan*.

# APPENDIX 1 – Development Consent

# Development Consent

## Section 80 of the *Environmental Planning and Assessment Act 1979*

I, the Minister for Infrastructure, Planning and Natural Resources, approve the Development Application referred to in Schedule 1, subject to the conditions in Schedules 2 to 4.

These conditions are required to:
- prevent, minimise, and/or offset adverse environmental impacts;
- set standards and performance measures for acceptable environmental performance;
- require regular monitoring and reporting; and
- provide for the on-going environmental management of the development.

SIGNED

Craig Knowles, MP
**Minister for Infrastructure, Planning and Natural Resources**

Sydney 3 June 2005 File No. S04/00635

**SCHEDULE 1**

| | |
|---|---|
| **Development Application:** | DA 265-10-2004. |
| **Applicant:** | Hunter Quarries Pty Limited. |
| **Consent Authority:** | Minister for Infrastructure, Planning and Natural Resources. |
| **Land:** | Lot 21 DP 1024341, Lot 11 DP 1024564 & Lot 12 DP 1024564. |
| **Proposed Development:** | The development includes:<br>• implementing the remainder of the approved Stage 1 quarry operation;<br>• extending the quarry operations into the Stage 2 area<br>• upgrading and using existing infrastructure on site;<br>• rehabilitating the site by re-contouring and revegetating exposed surfaces; and<br>• producing up to 500,000 tonnes of product a year over the next 22 years. |
| **State Significant** | The proposal is classified as State significant development under section 76A(7) of the *Environmental Planning and Assessment Act 1979* as it is an extractive industry that would extract more than 200,000 tonnes of material a year. |
| **Integrated Development:** | The proposal is classified as integrated development, under section 91 of the *Environmental Planning and Assessment Act 1979* as it requires an additional approval under the *Protection of the Environment Operations Act 1997.* |

| | |
|---|---|
| **Designated Development:** | The proposal is classified as designated development under section 77A of the *Environmental Planning and Assessment Act 1979* as it is an extractive industry that would "obtain or process for sale, or reuse, more than 30,000 cubic metres of extractive material per year…". Consequently, it meets the criteria for designated development in schedule 3 of the *Environmental Planning and Assessment Regulation 2000*. |

*Notes:*

- *To find out when this development consent becomes effective, see section 83 of the Environmental Planning and Assessment Act 1979* (EP&A Act);
- *To find out when this development consent is liable to lapse, see section 95 of the EP&A Act; and*
- *To find out about appeal rights, see section 97 of the EP&A Act*

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## DEFINITIONS

| | |
|---|---|
| AEMR | Annual Environmental Management Report |
| Applicant | Hunter Quarries Pty Limited, or its successors |
| BCA | Building Code of Australia |
| CCC | Community Consultative Committee |
| Council | Great Lakes Shire Council |
| DA | Development Application |
| Day | Day is defined as the period from 7am to 6pm on Monday to Saturday, and 8am to 6pm on Sundays and Public Holidays |
| DEC | Department of Environment and Conservation |
| Department | Department of Infrastructure, Planning and Natural Resources |
| Director-General | Director-General of the Department of Infrastructure, Planning and Natural Resources, or delegate |
| DPI | Department of Primary Industry |
| EIS | Environmental Impact Statement titled 'Environmental Impact Statement to accompany a State Significant Development Application for an existing Hard Rock Quarry, Property: Lot 21 DP 1024341 and Lot 11 DP 1024564, Pacific Highway, Karuah', Volumes 1, 2 & 3, dated October 2004 and prepared by Asquith and deWitt Pty Ltd |
| EP&A Act | Environmental Planning and Assessment Act 1979 |
| EP&A Regulation | Environmental Planning and Assessment Regulation 2000 |
| EPL | Environment Protection License |
| Evening | Evening is defined as the period from 6pm to 10pm |
| GTA | General Terms of Approval |
| Minister | Minister for Infrastructure and Planning, or delegate |
| Night | Night is defined as the period from 10pm to 7am on Monday to Saturday, and 10pm to 8am on Sundays and Public Holidays |
| POEO Act | *Protection of the Environment Operations Act 1997* |
| Privately owned land | Land not owned by the Applicant or its related companies or where a private agreement does not exist between the Applicant and the land owner |
| Receiver | As defined in the *NSW Industrial Noise Policy* (EPA 2000) |
| Site | Land to which the DA applies (Lot 21 DP 1024341, Lot 11 DP 1024564 & Lot 12 DP 1024564) |
| Stage 1 | Existing quarry operation approved by Great Lakes Shire Council on 11 November 1997 (DA 302/97) including the 'Karuah Red quarry' site, as marked on the map in Appendix 1. |
| Stage 2 | Proposed quarry extension as marked on the map in Appendix 1. |

## SCHEDULE 2
## ADMINISTRATIVE CONDITIONS

### OBLIGATION TO MINIMISE HARM TO THE ENVIRONMENT

1. The Applicant shall implement all practicable measures to prevent and/or minimise any harm to the environment that may result from the construction, operation, or rehabilitation of the development.

### TERMS OF APPROVAL

2. The Applicant shall carry out the development generally in accordance with the:
   (a) DA 265-10-2004;
   (b) EIS titled *Environmental Impact Statement to accompany a State Significant Development Application for an existing Hard Rock Quarry, Property: Lot 21 DP 1024341 and Lot 11 DP 1024564, Pacific Highway, Karuah*, Volumes 1, 2 & 3, dated October 2004 and prepared by Asquith and deWitt Pty Ltd; and
   (c) conditions of this development consent.

3. If there is any inconsistency between the above, the conditions of this consent shall prevail to the extent of the inconsistency.

4. The Applicant shall comply with any reasonable requirement/s of the Director-General arising from the Department's assessment of:
   (a) any reports, plans or correspondence that are submitted in accordance with this development consent; and
   (b) the implementation of any actions or measures contained in these reports, plans or correspondence.

### LIMITS ON APPROVAL

5. This consent lapses 22 years after the date it commences.

6. The Applicant shall not produce or transport more than 500,000 tonnes of material a year from the development.

7. The Applicant shall not extract more that 11.2 million tonnes of andecite from the site within the period of this consent.

### SURRENDER OF CONSENTS

8. Within 6 months of the date of this consent, the Applicant shall surrender all existing development consents and continuing use rights associated with the site, in accordance with clause 97 of the EP&A Regulation.

### STRUCTURAL ADEQUACY

9. The Applicant shall ensure that any new buildings and structures, and any alterations or additions to existing buildings and structures, are constructed in accordance with the relevant requirements of the BCA.

   *Notes:*
   - *Under Part 4A of the EP&A Act, the Applicant is required to obtain construction and occupation certificates for any building works.*
   - *Part 8 of the EP&A Regulation sets out the detailed requirements for the certification of development.*

### DEMOLITION

10. The Applicant shall ensure that all demolition work is carried out in accordance with *AS 2601-2001: The Demolition of Structures,* or its latest version.

### OPERATION OF PLANT AND EQUIPMENT

11. The Applicant shall ensure that all plant and equipment at the site, or used in connection with the development, are:
    a) maintained in a proper and efficient condition; and
    b) operated in a proper and efficient manner.

**IDENTIFICATION OF BOUNDARIES**

12. Within 6 months of the date of this consent, the Applicant shall:
    (a) engage a registered surveyor to mark out the boundaries of the approved limits of extraction under Stage 1 and Stage 2;
    (b) submit a survey plan of these boundaries and the proposed timing of extraction within Stage 1 and Stage 2 to the Director-General; and
    (c) ensure that these boundaries are clearly marked at all times in a permanent manner that allows operating staff and inspecting officers to clearly identify these limits.

**SECTION 94 CONTRIBUTIONS**

13. The Applicant shall pay a contribution of 4.7 cents per cubic meter of material per kilometere hauled to Council for the maintenance/repair of public roads in accordance with Council's Section 94 Plan for road haulage, to the satisfaction of Council.

    *Note: The applicable contribution rate is reviewed annually by Council and new rates, if applicable become operational from 1 July each year. The contribution is to be paid at the rate that is current at the time.*

**SCHEDULE 3**
**SPECIFIC ENVIRONMENTAL CONDITIONS**

## [1]NOISE

### Noise Impact Assessment Criteria

1. The Applicant shall ensure that the noise generated by the development does not exceed the criteria specified in Table 2 at any residence or noise sensitive receptor on privately owned land.

| Time Period | Noise Limits dB(A) |
|---|---|
| | $L_{Aeq\ (15minute)}$ |
| Day (7am to 6pm ) Monday to Friday and 7am to 1pm Saturday | 48 |
| Evening (6pm to 10pm) Monday to Friday | 47 |
| At all other times | 46 |

*Table 2: Noise Impact Assessment Criteria for the Development*

*Notes:*

- *Noise from the site is to be measured within thirty meters of any residence or other noise sensitive areas to determine compliance with the noise criteria set out in Table 2.*
- *$LA_{eq(15\ minute)}$ is the equivalent continuous noise level - the level of noise equivalent to the energy average of noise levels occurring over a measurement period.*
- *For the purpose of noise measures required for this condition, the $LA_{eq}$ noise level must be measured or computed at the point defined in this condition over a period of 15 minutes using "FAST" response on the sound level meter.*
- *For the purpose of the noise criteria for this condition, 5dBA must be added to the measured level if the noise is substantially tonal or impulsive in character. The location or point of impact can be different for each development, for example, at the closest residential receiver or at the closest boundary of the development. Measurement locations can be:*
  - *a) 1 meter from the facade of the residence for night time assessment;*
  - *b) at the residential boundary;*
  - *c) 30 meters from the residence (rural situations) where boundary is more than 30 meters from residence.*
- *The noise emission limits identified in this condition apply for prevailing meteorological conditions (winds up to 3m/s), except under conditions of temperature inversions. Noise impacts that may be enhanced by temperature inversions must be addressed by:*
  - *a) documenting noise complaints received to identify any higher level of impacts or patterns of temperature inversions;*
  - *b) where levels of noise complaints indicate a higher level of impact then actions to quantify and ameliorate any enhanced impacts under temperature inversions conditions should be developed and implemented.*

### Operating Hours

2. The Applicant shall comply with the operating hours in Table 1:

| Activity | Days of the Week | Time |
|---|---|---|
| • Construction<br>• Extraction and processing<br>• Internal and off-site transportation of product | Monday – Friday | 7am to 6pm |
| | Saturday | 7am to 1pm |
| | Sunday and public holidays | No work at any time |
| Minor maintenance works on plant and machinery | 7 days a week and public holidays | 7am to 6pm |

*Table 1: Operating Hours for the Development*

*Note: Delivery of material outside of the hours of operation permitted by condition 2 is only allowed, where that delivery is required by the police or other authorities for safety reasons; and/or where the operation or personnel or equipment are endangered. In such circumstances, prior notification should be provided to the DEC and affected residents as soon as possible, or within a reasonable period in the case of emergency.*

### Noise Monitoring

3. Within 6 months of the date of this consent, the Applicant shall prepare and implement a Noise Monitoring Program for the development to evaluate compliance with the noise impact assessment criteria in this consent, in consultation with the DEC, and to the satisfaction of the Director-General.

[1] Incorporates DEC GTAs

## [2]BLASTING AND VIBRATION

### Airblast Overpressure Criteria

4. The Applicant shall ensure that the airblast overpressure level from blasting at the development does not exceed the criteria in Table 3 at any residence or sensitive receiver on privately owned land.

| Airblast overpressure level [dB(Lin Peak)] | Allowable exceedance |
|---|---|
| 115 | 5% of the total number of blasts over a period of 12 months |
| 120 | 0% |

*Table 3: Airblast Overpressure Limits*

### Ground Vibration Criteria

5. The Applicant shall ensure that the peak particle velocity from blasting at the development does not exceed the criteria in Table 4 at any residence or sensitive receiver on privately owned land.

| Peak particle velocity (mm/s) | Allowable exceedance |
|---|---|
| 5 | 5% of the total number of blasts over a period of 12 months |
| 10 | 0% |

*Table 4: Ground Vibration Limits*

### Blasting Restrictions

6. Blasting at the site may only take place:
   a) between 9am and 3pm Monday to Friday inclusive;
   b) once per week; and
   c) at such other times as may be approved by the DEC.

### Public Notice

7. Within 6 months of this consent, the Applicant shall establish a blasting notification register of landowners and other interested persons, within 2 km of the quarry.

8. Throughout the life of the development, the Applicant shall notify all registered individuals of up coming blasting operations at the development site.

### Property Inspections

9. Within 3 months of this consent, the Applicant shall advise all landowners within 1 kilometer of the development that they are entitled to a structural property inspection.

10. If the Applicant receives a written request for a structural property inspection from any landowner within 1 kilometer of the development, the Applicant shall within 3 months of receiving this request:
    a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Director-General, to inspect the condition of any building or structure on the land, and if necessary recommend measures to mitigate any potential blasting impacts; and
    b) give the landowner a copy of the property inspection report.

### Property Investigations

11. If any landowner within 1 kilometre of the site claims that buildings and/or structures on his/her land have been damaged as a result of blasting at the development, the Applicant shall within 3 months of receiving this request:
    (a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Director-General, to investigate the claim; and
    (b) give the landowner a copy of the property investigation report.

[2] Incorporates DEC GTAs

If this independent property investigation confirms the landowner's claim, and both parties agree with these findings, then the Applicant shall repair the damages to the satisfaction of the Director-General.

If the Applicant or landowner disagrees with the findings of the independent property investigation, then either party may refer the matter to the Director-General for resolution.

If the matter cannot be resolved within 21 days, the Director-General shall refer the matter to an Independent Dispute Resolution Process (see Appendix 3).

**Operating Conditions**

12. The Applicant shall implement all practical measures to ensure the safety of people, and avoid and/or minimise any blasting impacts of the development on any privately owned land

**[3]AIR QUALITY**

**Air Quality Impact Assessment Criteria**

13. The Applicant shall ensure that the dust emissions generated by the development do not cause additional exceedances of the ambient air quality impact assessment criteria listed in Tables 6, 7, and 8 at any residence on, or on more than 25 percent of, any privately owned land.

| Pollutant | Averaging period | Criterion |
|---|---|---|
| Total suspended particulate (TSP) matter | Annual | 90 µg/$m^3$ |
| Particulate matter < 10 µm ($PM_{10}$) | Annual | 30 µg/$m^3$ |

*Table 6: Long Term Impact Assessment Criteria for Particulate Matter*

| Pollutant | Averaging period | Criterion |
|---|---|---|
| Particulate matter < 10 µm ($PM_{10}$) | 24 hour | 50 µg/$m^3$ |

*Table 7: Short Term Impact Assessment Criterion for Particulate Matter*

| Pollutant | Averaging period | Maximum increase in deposited dust level | Maximum total deposited dust level |
|---|---|---|---|
| Deposited dust | Annual | 2 g/$m^2$/month | 4 g/$m^2$/month |

*Table 8: Long Term Impact Assessment Criteria for Deposited Dust*

*Note: Deposited dust is assessed as insoluble solids as defined by Standards Australia, 2003, AS 3580.10.1-1991: Methods for Sampling and Analysis of Ambient Air - Determination of Particulates - Deposited Matter - Gravimetric Method.*

**Operating Conditions**

14. The Applicant shall implement all practical measures to minimise and/or prevent the emission of dust from the site.

**Monitoring**

15. Within 6 months of the date of this consent, the Applicant shall prepare and implement an Air Quality Monitoring Program for the development to evaluate compliance with the air quality impact assessment criteria in this consent, in consultation with the DEC, and to the satisfaction of the Director-General.

**[4]METEOROLOGICAL MONITORING**

16. Within 6 months of this consent, the Applicant shall ensure that there is a suitable meteorological station operating in the vicinity of the development in accordance with the requirements in Approved Methods for Sampling of Air Pollutants in New South Wales, and to the satisfaction of the DEC and the Director-General.

[3] Incorporates DEC GTAs

[4] Incorporates DEC GTAs

**FLORA AND FAUNA**

**Conservation Offset Area**

17. The Applicant shall establish, conserve, and maintain the area of vegetation in Lot 12 DP 1024564 marked on the map in Appendix 2, to the satisfaction of the Director- General.

18. Within 3 years of this consent, the Applicant shall implement suitable arrangements to provide long term security for the conservation offset area, to the satisfaction of the Director-General.

    *Note: The long term security of the offset can be achieved through a combination of the following: Deed of Agreement with the Minister, rezoning the land under the Great Lakes Local Environment Plan 1996, caveats on the title under the Conveyancing Act 191, etc….*

**Flora and Fauna Management Plan**

19. Before carrying out any clearing associated with Stage 2 of the development, the Applicant shall prepare, and subsequently implement, a Flora and Fauna Management Plan for the development to the satisfaction of the Director-General. This plan must include:
    a) a Vegetation Clearing Protocol;
    b) a Remnant Vegetation Conservation Plan; and
    c) a Conservation Offset Management Plan.

20. The Vegetation Clearing Protocol shall describe the procedures that would be implemented for:
    a) minimising the areas of remnant vegetation to be cleared;
    b) delineating areas of remnant vegetation to be cleared;
    c) protecting areas outside of the disturbance areas;
    d) undertaking pre-clearance surveys (including observations/surveys for threatened species);
    e) identification of fauna management strategies;
    f) conserving and reusing topsoil;
    g) collecting seed from the site for rehabilitation works;
    h) salvaging and reusing material from the site for habitat enhancement; and
    i) controlling weeds.

21. The Remnant Vegetation Conservation Plan shall:
    a) describe what measures would be implemented to conserve, maintain and enhance the vegetation on the site which will not be cleared as part of the development (in particular sub-populations of Tetratheca juncea (Black-eyed Susan)); and
    b) describe how the performance of these measures would be monitored over time.

22. The Conservation Offset Management Plan shall:
    a) describe the habitat in the conservation offset area for following threatened species:
        - Phascogale tapoatafa (Brush-tailed Phascogale);
        - Ninox strenua (Powerful Owl);
        - Phascolarctos cinereus (Koala); and
        - Tetratheca juncea (Black-eyed Susan).
    b) justify why this area is suitable as a conservation offset for the species described in (a) above;
    c) establish baseline data for the existing habitat in the proposed conservation offset area;
    d) describe how the proposed conservation offset area would be managed, including long-term measures for:
        - feral animal control;
        - weed management;
        - stock management; and
        - bush fire management.
    e) describe how the ecological performance of the conservation offset area would be monitored over time.

**Reporting**

23. The Applicant shall include a progress report on the implementation and performance of the Flora and Fauna Management Plan and the Conservation Offset Strategy in the AEMR.

## [5]SURFACE WATER

### Pollution of Waters

24. Except as may be expressly provided by an Environment Protection License, the Applicant shall comply with section 120 of the *Protection of the Environment Operations Act 1997* during the carrying out of the development.

### Water Discharge Limit

25. The Applicant shall only discharge water from the development in accordance with the provisions of a DEC Environment Protection License

### Site Water Management Plan

26. Within 12 months of the date of this consent, the Applicant shall prepare, and subsequently implement, a Site Water Management Plan for the development, in consultation with the DEC, and to the satisfaction of the Director-General. The plan shall detail how site water management on site will be integrated with existing surface water management and erosion and sediment control systems and address surface water management and erosion and sediment control at both the construction and operation phases of the development. This plan must include:
    a) an Erosion and Sediment Control Plan;
    b) a Surface Water Monitoring Program; and
    c) a site water balance.

### Erosion and Sediment Control

27. The Erosion and Sediment Control Plan must:
    a) be consistent with the requirements of the Department of Housing's Managing Urban Stormwater: Soils and Construction manual;
    b) identify activities that could cause soil erosion and generate sediment;
    c) describe what measures would be implemented to minimise soil erosion and off-site sediment transport from the following locations:
        - the active quarry face and pit;
        - product and top soil stockpile sites;
        - haul roads;
        - workshop areas;
        - rehabilitation areas; and
        - all other exposed and disturbed surfaces within the site.
    d) describe the location and function of erosion and sediment control structures and their capacity to contain runoff in relation to above average rainfall events;
    e) describe what measures would be implemented to maintain the structures over time;
    f) describe how the effectiveness of the Erosion and Sediment Control Plan will be measured and monitored.

### Surface Water Monitoring

28. The Applicant shall:
    a) measure:
        - the volume of water discharged from the site via licensed discharge points;
        - water use on the site;
        - water transfers across the site; and
        - dam and water structure storage levels.
    b) regularly monitor the quality of the surface water discharged from the licensed discharge points on the site;

    to the satisfaction of the DEC and the Director-General.

## VISUAL IMPACT

29. The Applicant shall
    a) implement all practicable measures to minimise the visual impacts of the development;
    b) retain, re-vegetate and subsequently maintain a visual bund within the Stage 1 works area (in accordance with Figures 13 and 14 of the EIS) to minimise the visual impacts of development;
    c) include a progress report on the re-vegetation and maintenance of the visual bund in the AEMR,

    to the satisfaction of the Director General.

[5] Incorporates DEC GTAs

## [6]TRAFFIC AND TRANSPORT

### Pacific Highway

30. The Applicant shall ensure that vehicular access to and from the quarry and the Pacific Highway is via the newly constructed grade separated interchange at Branch Lane.

### Parking

31. The Applicant shall provide sufficient parking on-site for all quarry-related traffic to the satisfaction of the Director-General.

### Road Haulage

32. The Applicant shall ensure that all loaded vehicles entering or leaving the site are covered.

33. The Applicant shall ensure that sediment and/or other pollutants are not tracked onto any public roads servicing the development.

## [7]WASTE MANAGEMENT

34. The Applicant shall:
    a) monitor the amount of waste generated by the development;
    b) investigate ways to minimise waste generated by the development;
    c) implement reasonable and feasible measures to minimise waste generated by the development; and
    d) report on waste management and minimisation in the AEMR.

    to the satisfaction of the Director-General.

35. The Applicant must not cause, permit or allow any waste generated outside the site to be received at the site for storage, treatment, processing, reprocessing or disposal or any waste generated at the site to be disposed of at the site, except as expressly permitted by a licence under the Protection of the Environment Operations Act 1997.

    *Note: the above condition only applies to the storage, treatment, processing, reprocessing or disposal of waste at the site if it requires an environment protection licence under the Protection of the Environment Operations Act 1997.*

## BUSHFIRE MANAGEMENT

36. The Applicant shall:
    a) ensure that the development is suitably equipped to respond to any fires on-site; and
    b) assist the Rural Fire Service and Emergency Services as much as possible if there is a fire on-site.; and within 6 months of the date of this consent, the Applicant shall prepare a conservation sensitive Bushfire Management Plan for the development, to the satisfaction of Council and the Rural Fire Service.

## PRODUCTION DATA

37. The Applicant shall:
    a) provide annual production data to the DPI (Minerals) using the standard form for that purpose; and
    b) include a copy of this data in the AEMR.

## REHABILITATION

38. The Applicant shall progressively rehabilitate the site to the satisfaction of the Director-General.

### Rehabilitation Management Plan

39. Within 6 months of the date of this consent, the Applicant shall prepare, and subsequently implement, a Rehabilitation Management Plan for the site, which integrates rehabilitation works for both Stage 1 and Stage 2 areas, to the satisfaction of the Director-General: This plan must:
    a) identify the disturbed area at the site (both Stage 1 and Stage 2);
    b) describe in general the short, medium, and long term measures that would be implemented to rehabilitate the site;
    c) describe in detail the measures that would be implemented over the next 5 years to rehabilitate the site; and
    d) describe in detail how rehabilitation measures will be integrated with:

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[6] Incorporates DEC GTAs

[7] Incorporates DEC GTAs

- erosion and sediment control works on site;
- remnant vegetation and habitat enhancement and conservation works; and
- visual screening works;

e) describe how the performance of these measures would be monitored over time.

40. Within 5 years of providing the Rehabilitation Management Plan to the Director-General, and every 5 years thereafter, the Applicant shall review and update the plan to the satisfaction of the Director-General.

**Reporting**

41. The Applicant shall include a progress report on the Rehabilitation Management Plan in the AEMR.

**Rehabilitation Bond**

42. Within 6 months of the date of this consent, the Applicant shall lodge a suitable conservation and rehabilitation bond for the development with the Director-General. The sum of the bond shall be calculated at $\$2.50/m^2$, or as otherwise agreed to with the Director-General, for the area of disturbance at the development.

    *Notes:*
    - *If the rehabilitation is completed to the satisfaction of the Director-General, the Director-General will release the rehabilitation bond.*
    - *If the rehabilitation is not completed to the satisfaction of the Director-General, the Director-General will call in all, or part of, the rehabilitation bond, and arrange for the satisfactory completion of these works.*

43. Within 3 years of lodging the rehabilitation bond with the Director-General, and every 5 years thereafter, unless the Director-General directs otherwise, the Applicant shall review, and if necessary revise, the sum of the rehabilitation bond to the satisfaction of the Director-General. This review must consider:
    a) the effects of inflation;
    b) any changes to the area of disturbance; and
    c) the performance of any progressive rehabilitation which has been undertaken at the site.

**QUARRY CLOSURE PLAN**

44. At least 3 years prior to the cessation of quarrying, the Applicant shall prepare a Quarry Closure Plan for the development, in consultation with the Council, and to the satisfaction of the Director-General. The plan must:
    a) define the objectives and criteria for quarry closure;
    b) investigate options for the future use of the site, including any final void(s);
    c) describe the measures that would be implemented to minimise or manage the ongoing environmental effects of the development; and
    d) describe how the performance of these measures would be monitored over time.

## SCHEDULE 4
## ENVIRONMENTAL MANAGEMENT, MONITORING, AUDITING AND REPORTING

### ENVIRONMENTAL MANAGEMENT STRATEGY

1. Within 6 months of the date of this consent, the Applicant shall prepare, and subsequently implement an Environmental Management Strategy for the development to the satisfaction of the Director-General. This strategy must:
   a) provide the strategic context for environmental management of the development;
   b) identify the statutory requirements that apply to the development;
   c) describe in general how the environmental performance of the development would be monitored and managed during the development;
   d) describe the procedures that would be implemented to:
      - keep the local community and relevant agencies informed about the operation and environmental performance of the development;
      - receive, handle, respond to, and record complaints;
      - resolve any disputes that may arise during the course of the development;
      - respond to any non-compliance;
      - manage cumulative impacts; and
      - respond to emergencies; and
   e) describe the role, responsibility, authority, and accountability of all the key personnel involved in environmental management of the development.

2. Within 3 months of the completion of the Independent Environmental Audit (see condition 6 below), the Applicant shall review, and if necessary revise, the Environmental Management Strategy to the satisfaction of the Director-General.

### ENVIRONMENTAL MONITORING PROGRAM

3. Within 6 months of the date of this consent, the Applicant shall prepare an Environmental Monitoring Program for the development, in consultation with the relevant agencies, and to the satisfaction of the Director-General. This program must consolidate the various monitoring requirements in Schedule 4 of this consent into a single document.

4. Within 3 months of the completion of the Independent Environmental Audit (see condition 6 below), the Applicant shall review, and if necessary revise, the Environmental Monitoring Program to the satisfaction of the Director-General.

### ANNUAL REPORTING

5. The Applicant shall prepare and submit an AEMR to the Director-General and the relevant agencies. This report must address:
   a) identify the standards and performance measures that apply to the development;
   b) describe the works carried out in the last 12 months;
   c) describe the works that will be carried out in the next 12 months;
   d) include a summary of the complaints received during the past year, and compare this to the complaints received in previous years;
   e) include a summary of the monitoring results for the development during the past year;
   f) include an analysis of these monitoring results against the relevant:
      - impact assessment criteria;
      - monitoring results from previous years; and
      - predictions in the EIS;
   g) identify any trends in the monitoring results over the life of the development;
   h) identify any non-compliance during the previous year; and
   i) describe what actions were, or are being taken to ensure compliance.

### INDEPENDENT ENVIRONMENTAL AUDIT

6. Within 2 years of the date of this consent, and every 5 years thereafter, unless the Director-General directs otherwise, the Applicant shall commission and pay the full cost of an Independent Environmental Audit of the development. This audit must:
   a) be conducted by a suitably qualified, experienced, and independent person whose appointment has been endorsed by the Director-General;
   b) be consistent with *ISO 19011:2002 - Guidelines for Quality and/ or Environmental Systems Auditing*, or updated versions of this guideline;
   c) assess the environmental performance of the development, and its effects on the surrounding environment;
   d) assess whether the development is complying with the relevant standards, performance measures, and statutory requirements;

e) review the adequacy of the Applicant's Environmental Management Strategy and Environmental Monitoring Program; and
f) if necessary, recommend measures or actions to improve the environmental performance of the development, and/or the environmental management and monitoring systems.

7. Within 3 months of commissioning this audit, or as otherwise agreed by the Director-General, the Applicant shall submit a copy of the audit report to the Director-General, with a response to the recommendations contained in the audit report.

**COMMUNITY CONSULTATIVE COMMITTEE**

8. Within 3 months of the date of this consent the Applicant shall seek expressions of interest from members of the local community to serve as a member of a Community Consultative Committee for the development.

9. If at least two members of the local community express an interest to serve on the CCC the Applicant shall establish the CCC. The CCC shall:
(a) be comprised of:
- 2 representatives from the Applicant, including the person responsible for environmental management at the quarry;
- 1 representative from Council (if available); and
- at least 2 representatives from the local community,

whose appointment has been approved by the Director-General in consultation with the Council;
(b) be chaired by an independent chairperson, whose appointment has been endorsed by the Director-General;
(c) meet at least twice a year; and
(d) review and provide advice on the environmental performance of the development, including any construction or environmental management plans, monitoring results, audit reports, or complaints.

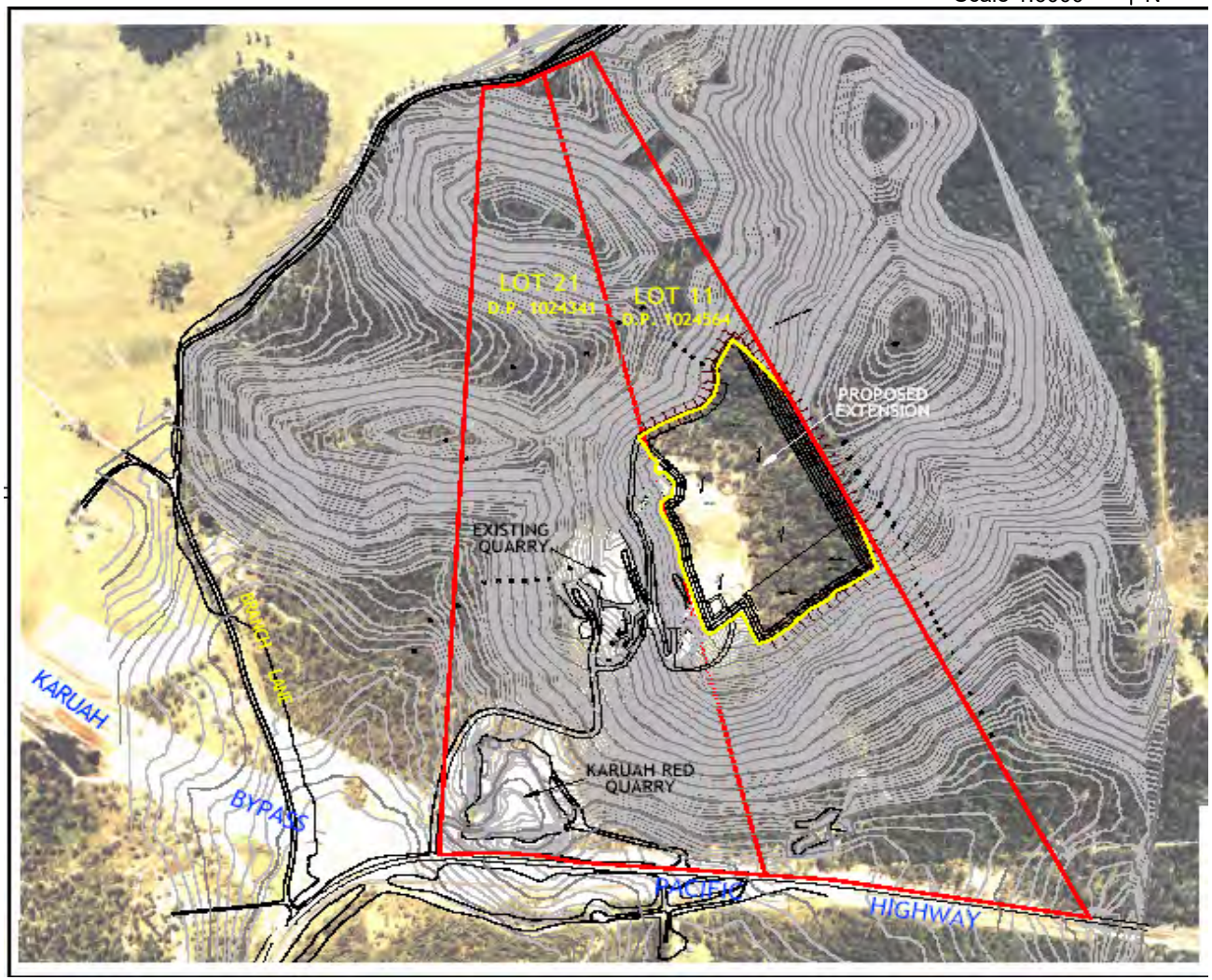
In addition, the Applicant shall, at its own expense:
(a) ensure that 2 of its representatives attend the Committee's meetings;
(b) provide the Committee with regular information on the environmental performance and management of the development;
(c) provide meeting facilities for the Committee;
(d) arrange site inspections for the Committee, if necessary;
(e) take minutes of the Committee's meetings;
(f) make these minutes available to the public for inspection within 14 days of the Committee meeting, or as agreed to by the Committee;
(g) respond to any advice or recommendations the Committee may have in relation to the environmental management or performance of the development; and
(h) forward a copy of the minutes of each Committee meeting, and any responses to the Committee's recommendations to the Director-General within a month of acceptance of the minutes by the Committee.

10. If the Applicant does not receive at least two expressions of interest to serve on the CCC the Applicant shall instead develop a communications strategy for consulting with Council and residents within 2 km of the development, to the satisfaction of the Director-General. This strategy should outline how the Applicant will advise Council and nearby residents on its environmental management plans, monitoring results, audit reports or complaints. This communication should occur twice a year.

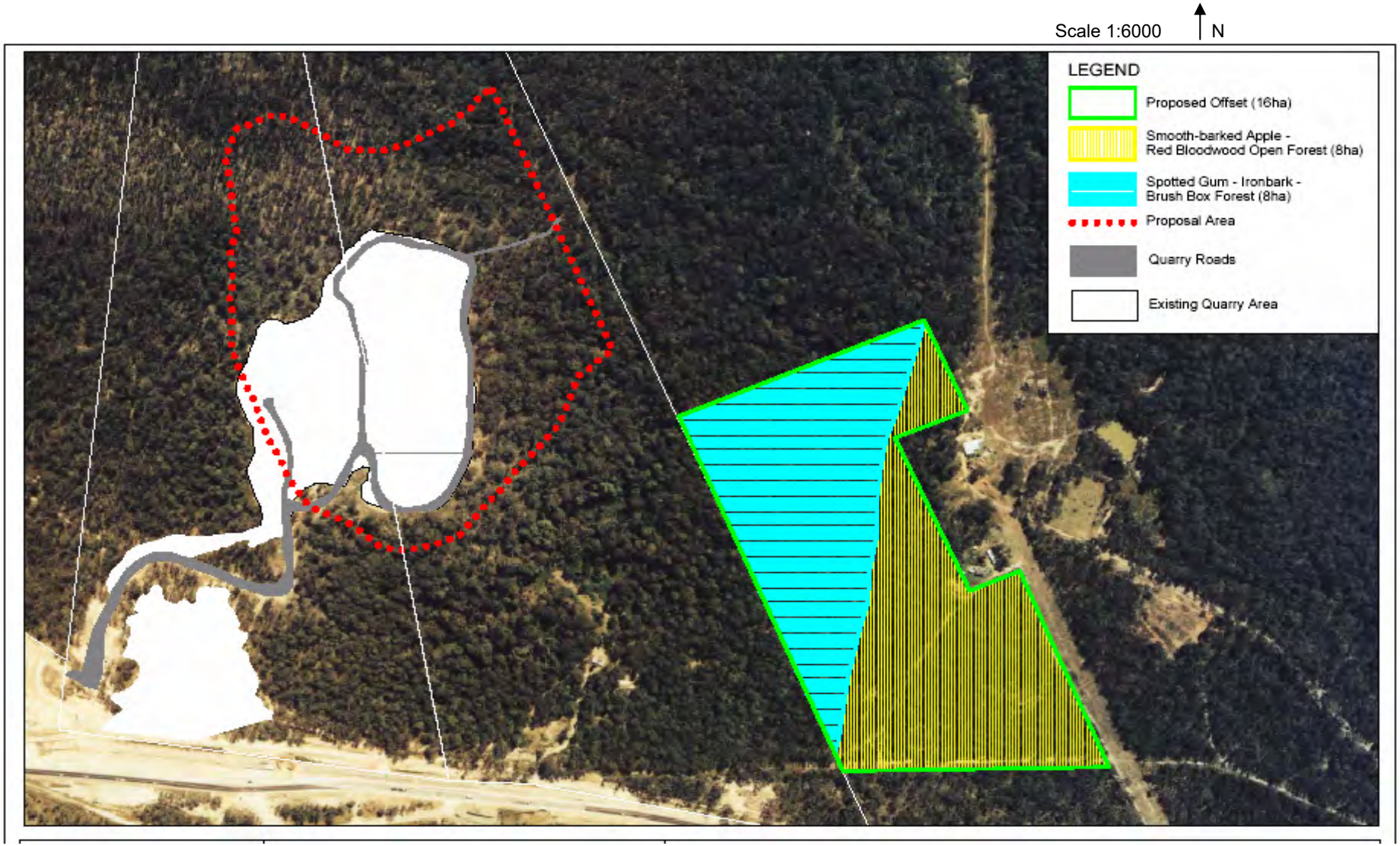
*Notes: If during the course of the development, a Community Consultative Committee that has been established is found to be no longer effective, the Director-General may agree to its disbandment.*

**APPENDIX 1: STAGE 1 AND STAGE 2 QUARRY OPERATIONS**

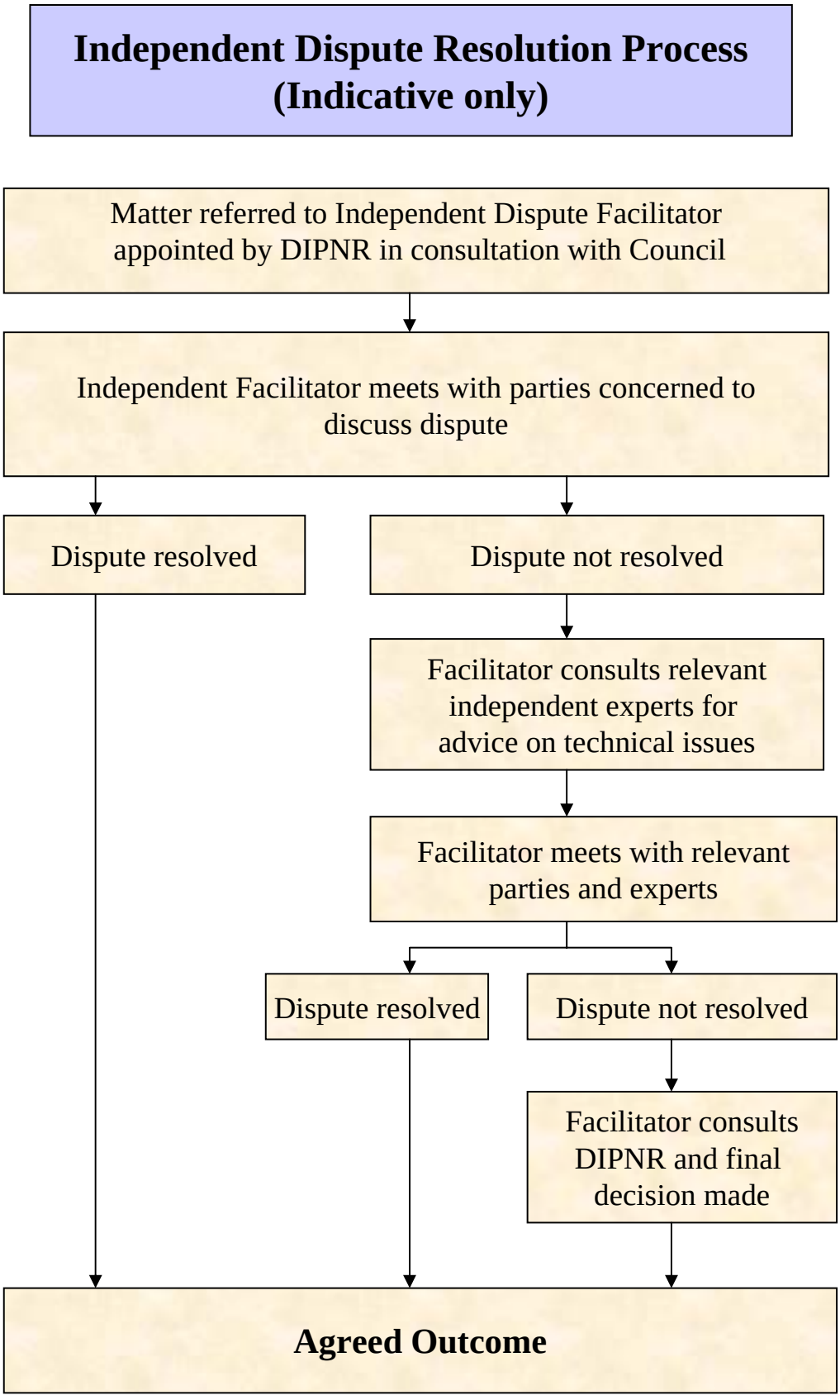
Scale 1:6000 N



**APPENDIX 2: CONSERVATION OFFSET AREA**



**APPENDIX 3: DISPUTE RESOLUTION PROCESS**



# APPENDIX 2 – Environment Protection Licence

# Environment Protection Licence

Licence - 11569

| Licence Details | |
|---|---|
| Number: | 11569 |
| Anniversary Date: | 16-January |

**Licensee**

HUNTER QUARRIES PTY LTD

PO BOX 3284

THORNTON NSW 2322

**Premises**

KARUAH QUARRY

CORNER OF ANDERSITE ROAD AND THE BRANCH LANE

KARUAH NSW 2324

**Scheduled Activity**

Crushing, grinding or separating

Extractive activities

| Fee Based Activity | Scale |
|---|---|
| Crushing, grinding or separating | > 100000-500000 T annual processing capacity |
| Land-based extractive activity | > 100000-500000 T annual capacity to extract, process or store |

**Region**

North - Hunter

Ground Floor, NSW Govt Offices, 117 Bull Street

NEWCASTLE WEST NSW 2302

Phone: (02) 4908 6800

Fax: (02) 4908 6810

PO Box 488G NEWCASTLE

NSW 2300

# Environment Protection Licence

Licence - 11569

# Environment Protection Licence

Licence - 11569

# Environment Protection Licence

Licence - 11569

## Information about this licence

### Dictionary

A definition of terms used in the licence can be found in the dictionary at the end of this licence.

### Responsibilities of licensee

Separate to the requirements of this licence, general obligations of licensees are set out in the Protection of the Environment Operations Act 1997 ("the Act") and the Regulations made under the Act. These include obligations to:

- ensure persons associated with you comply with this licence, as set out in section 64 of the Act;
- control the pollution of waters and the pollution of air (see for example sections 120 - 132 of the Act);
- report incidents causing or threatening material environmental harm to the environment, as set out in Part 5.7 of the Act.

### Variation of licence conditions

The licence holder can apply to vary the conditions of this licence. An application form for this purpose is available from the EPA.

The EPA may also vary the conditions of the licence at any time by written notice without an application being made.

Where a licence has been granted in relation to development which was assessed under the Environmental Planning and Assessment Act 1979 in accordance with the procedures applying to integrated development, the EPA may not impose conditions which are inconsistent with the development consent conditions until the licence is first reviewed under Part 3.6 of the Act.

### Duration of licence

This licence will remain in force until the licence is surrendered by the licence holder or until it is suspended or revoked by the EPA or the Minister. A licence may only be surrendered with the written approval of the EPA.

### Licence review

The Act requires that the EPA review your licence at least every 5 years after the issue of the licence, as set out in Part 3.6 and Schedule 5 of the Act. You will receive advance notice of the licence review.

### Fees and annual return to be sent to the EPA

For each licence fee period you must pay:

- an administrative fee; and
- a load-based fee (if applicable).

# Environment Protection Licence

Licence - 11569

The EPA publication “A Guide to Licensing” contains information about how to calculate your licence fees. The licence requires that an Annual Return, comprising a Statement of Compliance and a summary of any monitoring required by the licence (including the recording of complaints), be submitted to the EPA. The Annual Return must be submitted within 60 days after the end of each reporting period. See condition R1 regarding the Annual Return reporting requirements.

Usually the licence fee period is the same as the reporting period.

**Transfer of licence**

The licence holder can apply to transfer the licence to another person. An application form for this purpose is available from the EPA.

**Public register and access to monitoring data**

Part 9.5 of the Act requires the EPA to keep a public register of details and decisions of the EPA in relation to, for example:

- licence applications;
- licence conditions and variations;
- statements of compliance;
- load based licensing information; and
- load reduction agreements.

Under s320 of the Act application can be made to the EPA for access to monitoring data which has been submitted to the EPA by licensees.

## This licence is issued to:

| |
|---|
| **HUNTER QUARRIES PTY LTD** |
| **PO BOX 3284** |
| **THORNTON NSW 2322** |

subject to the conditions which follow.

# Environment Protection Licence

Licence - 11569

## 1 Administrative Conditions

### A1 What the licence authorises and regulates

A1.1 This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee-based activity classification and the scale of the operation.

Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition.

| Scheduled Activity | Fee Based Activity | Scale |
|---|---|---|
| Crushing, grinding or separating | Crushing, grinding or separating | > 100000 - 500000 T annual processing capacity |
| Extractive activities | Land-based extractive activity | > 100000 - 500000 T annual capacity to extract, process or store |

### A2 Premises or plant to which this licence applies

A2.1 The licence applies to the following premises:

| Premises Details |
|---|
| KARUAH QUARRY |
| CORNER OF ANDERSITE ROAD AND THE BRANCH LANE |
| KARUAH |
| NSW 2324 |
| LOT 21 DP 1024341, LOT 11 DP 1024564, LOT 12 DP 1024564 |

### A3 Information supplied to the EPA

A3.1 Works and activities must be carried out in accordance with the proposal contained in the licence application, except as expressly provided by a condition of this licence.

In this condition the reference to "the licence application" includes a reference to:
a) the applications for any licences (including former pollution control approvals) which this licence replaces under the Protection of the Environment Operations (Savings and Transitional) Regulation 1998; and
b) the licence information form provided by the licensee to the EPA to assist the EPA in connection with the issuing of this licence.

# Environment Protection Licence

Licence - 11569

## 2 Discharges to Air and Water and Applications to Land

### P1 Location of monitoring/discharge points and areas

P1.1 The following utilisation areas referred to in the table below are identified in this licence for the purposes of the monitoring and/or the setting of limits for any application of solids or liquids to the utilisation area.

P1.2 The following points referred to in the table are identified in this licence for the purposes of the monitoring and/or the setting of limits for discharges of pollutants to water from the point.

***Water and land***

| EPA Identification no. | Type of Monitoring Point | Type of Discharge Point | Location Description |
|---|---|---|---|
| 1 | Discharge to waters<br>Discharge quality monitoring | Discharge to waters<br>Discharge quality monitoring | Discharge from sediment dam No 2 identified as "Water Monitoring Site" as shown on map titled "Karuah Hard Rock Quarry Environmental Monitoring Locations, Figure 1" dated 23/06/2014 and filed as EPA document DOC16/422333 on File EF13/3101 |

P1.3 The following points referred to in the table below are identified in this licence for the purposes of monitoring and/or the setting of limits for the emission of pollutants to the air from the point.

***Air***

| EPA identification no. | Type of Monitoring Point | Type of Discharge Point | Location Description |
|---|---|---|---|
| 2 | Dust deposition monitoring | | Dust deposition gauge DDG1, as shown on map titled "Karuah Hard Rock Quarry Environmental Monitoring Locations, Figure 1" dated 23/06/2014 and filed as EPA document DOC16/422333 on File EF13/3101 |
| 3 | Dust deposition monitoring | | Dust deposition gauge DDG2, as shown on map titled "Karuah Hard Rock Quarry Environmental Monitoring Locations, Figure 1" dated 23/06/2014 and filed as EPA document DOC16/422333 on File EF13/3101 |
| 4 | Dust deposition monitoring | | Dust deposition gauge DDG3, as shown on map titled "Karuah Hard Rock Quarry Environmental Monitoring Locations, Figure 1" dated 23/06/2014 and filed as EPA document DOC16/422333 on File EF13/3101 |
| 5 | Dust deposition monitoring | | Dust deposition gauge DDG4, as shown on map titled "Karuah Hard Rock Quarry Environmental Monitoring Locations, Figure 1" dated 23/06/2014 and filed as EPA document DOC16/422333 on File EF13/3101 |

# Environment Protection Licence

Licence - 11569

## 3 Limit Conditions

### L1 Pollution of waters

L1.1 Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.

### L2 Concentration limits

L2.1 For each monitoring/discharge point or utilisation area specified in the table\s below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table.

L2.2 Where a pH quality limit is specified in the table, the specified percentage of samples must be within the specified ranges.

L2.3 To avoid any doubt, this condition does not authorise the pollution of waters by any pollutant other than those specified in the table\s.

L2.4 Water and/or Land Concentration Limits

**POINT 1**

| Pollutant | Units of Measure | 50 percentile concentration limit | 90 percentile concentration limit | 3DGM concentration limit | 100 percentile concentration limit |
|---|---|---|---|---|---|
| Oil and Grease | Visible | | | | 5 &/or non-visible |
| pH | pH | | | | 6.5 - 8.5 |
| Total suspended solids | milligrams per litre | | | | 50 |

Note: The oil and grease limit specified in the table above is defined as not more than 5 milligrams per litre (mg/L) and/or no visible oil and grease.

### L3 Waste

L3.1 The licensee must not cause, permit or allow any waste generated outside the premises to be received at the premises for storage, treatment, processing, reprocessing or disposal or any waste generated at the

premises to be disposed of at the premises, except as expressly permitted by the licence.

L3.2 This condition only applies to the storage, treatment, processing, reprocessing or disposal of waste at the premises if those activities require an environment protection licence.

## L4 Blasting

L4.1 Blasting in or on the premises must only be carried out between 0900 hours and 1500 hours, Monday to Friday. Blasting in or on the premises must not take place on weekends or Public Holidays without the prior approval of the EPA.

L4.2 The airblast overpressure level from blasting operations in or on the premises must not exceed:
115 dB (Lin Peak) for more than 5% of the total number of blasts during each reporting period at any residence or noise sensitive location (such as a school or hospital) that is not owned by the licensee or subject of a private agreement between the owner of the residence or noise sensitive location and the licensee as to an alternative overpressure level.

L4.3 The airblast overpressure level from blasting operations in or on the premises must not exceed:
120 dB (Lin Peak) at any time at any residence or noise sensitive location (such as a school or hospital) that is not owned by the licensee or subject of a private agreement between the owner of the residence or noise sensitive location and the licensee as to an alternative overpressure level.

L4.4 The ground vibration peak particle velocity from blasting operations carried out in or on the premises must not exceed 5 mm/second for more than 5% of the total number of blasts during each reporting period at any residence or noise sensitive location (such as a school or hospital) that is not owned by the licensee or subject of a private agreement between the owner of the residence or noise sensitive location and the licensee as to an alternative overpressure level.

L4.5 The ground vibration peak particle velocity from blasting operations carried out in or on the premises must not exceed 10 mm/second at any time at any residence or noise sensitive location (such as a school or hospital) that is not owned by the licensee or subject of a private agreement between the owner of the residence or noise sensitive location and the licensee as to an alternative overpressure level.

L4.6 Error margins associated with any monitoring equipment used to measure airblast overpressure or peak particle velocity are not to be taken into account in determing whether or not the limit(s) has been exceeded.

L4.7 Offensive blast fume must not be emitted from the premises.

*Definition:*

*Offensive blast fume means post-blast gases from the detonation of explosives at the premises that by reason of their nature, duration, character or quality, or the time at which they are emitted, or any other circumstances:*
1. *are harmful to (or likely to be harmful to) a person that is outside the premises from which it is emitted, or*
2. *interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted.*

# Environment Protection Licence



## 4 Operating Conditions

### O1 Activities must be carried out in a competent manner

O1.1 Licensed activities must be carried out in a competent manner.
This includes:
a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and
b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.

### O2 Maintenance of plant and equipment

O2.1 All plant and equipment installed at the premises or used in connection with the licensed activity:
a) must be maintained in a proper and efficient condition; and
b) must be operated in a proper and efficient manner.

### O3 Dust

O3.1 All areas in or on the premises must be maintained in a condition that prevents or minimises the emission of dust to the air.

O3.2 Any activity carried out in or on the premises must be carried out by such practical means as to prevent dust or minimise the emission of dust to the air.

O3.3 Any plant operated in or on the premises must be operated by such practical means to prevent or minimise dust or other air pollutants.

O3.4 All trafficable areas and vehicle manoeuvring areas in or on the premises must be maintained, at all times, in a condition that will minimise the emmission of dust to the air, or emmission from the premises of wind-blown or traffic generated dust.

### O4 Emergency response

O4.1 The licensee must maintain, and implement as necessary, a current Pollution Incident Response Management Plan (PIRMP) for the premises. The licensee must keep the incident response plan on the premises at all times. The incident response plan must document systems and procedures to deal with all types of incidents (e.g. spills, explosions or fire) that may occur at the premises or that may be associated with activities that occur at the premises and which are likely to cause harm to the environment.

The PIRMP must be tested at least annually or following a pollution incident.

The licensee must develop the Pollution Incident Response Management Plan in accordance with the

requirements in Part 5.7A of the Protection of the Environment Operations (POEO) Act 1997 and POEO regulations.

### O5 Processes and management

O5.1 All tanks and storage areas for drums containing material that has potential to cause environmental harm must be bunded or have an alternative spill containment system in-place.

The bunding and/or spill containment systems must be properly designed, engineered, and constructed to be suitable for the material types and quantities stored therein in accordance with all appropriate standards, including Australian Standards (AS)1940 and AS1596.

O5.2 Bunds must:
a) have walls and floors constructed of impervious materials;
b) be of sufficient capacity to contain 110% of the volume of the tank (or 110% volume of the largest tank where a group of tanks are installed);
c) have floors graded to a collection sump; and
d) not have a drain valve incorporated in the bund structure,

or be constructed and operated in a manner that achieves the same environmental outcome.

O5.3 The drainage from all areas at the premises which will liberate suspended solids when stormwater runs over these areas must be diverted into adequately sized sedimentation basins.

O5.4 The sedimentation basins must be maintained to ensure that their design capacity is available for the storage of all runoff from cleared areas.

## 5 Monitoring and Recording Conditions

### M1 Monitoring records

M1.1 The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.

M1.2 All records required to be kept by this licence must be:
a) in a legible form, or in a form that can readily be reduced to a legible form;
b) kept for at least 4 years after the monitoring or event to which they relate took place; and
c) produced in a legible form to any authorised officer of the EPA who asks to see them.

M1.3 The following records must be kept in respect of any samples required to be collected for the purposes of this licence:
a) the date(s) on which the sample was taken;
b) the time(s) at which the sample was collected;
c) the point at which the sample was taken; and
d) the name of the person who collected the sample.

# Environment Protection Licence

Licence - 11569

## M2 Requirement to monitor concentration of pollutants discharged

M2.1 For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:

M2.2 Air Monitoring Requirements

**POINT 2,3,4,5**

| Pollutant | Units of measure | Frequency | Sampling Method |
|---|---|---|---|
| Particulates - Deposited Matter | grams per square metre per month | Monthly | AM-19 |

M2.3 Water and/ or Land Monitoring Requirements

**POINT 1**

| Pollutant | Units of measure | Frequency | Sampling Method |
|---|---|---|---|
| Nitrogen (total) | milligrams per litre | Daily during any discharge | Grab sample |
| Oil and Grease | Visible | Daily during any discharge | Visual Inspection |
| pH | pH | Daily during any discharge | Grab sample |
| Phosphorus (total) | milligrams per litre | Daily during any discharge | Grab sample |
| Total suspended solids | milligrams per litre | Daily during any discharge | Grab sample |

## M3 Testing methods - concentration limits

M3.1 Subject to any express provision to the contrary in this licence, monitoring for the concentration of a pollutant discharged to waters or applied to a utilisation area must be done in accordance with the Approved Methods Publication unless another method has been approved by the EPA in writing before any tests are conducted.

Note: The *Protection of the Environment Operations (Clean Air) Regulation 2010* requires testing for certain purposes to be conducted in accordance with test methods contained in the publication "Approved Methods for the Sampling and Analysis of Air Pollutants in NSW".

M3.2 Monitoring for the concentration of a pollutant emitted to the air required to be conducted by this licence must be done in accordance with:

a) any methodology which is required by or under the Act to be used for the testing of the concentration of the pollutant; or
b) if no such requirement is imposed by or under the Act, any methodology which a condition of this licence requires to be used for that testing; or
c) if no such requirement is imposed by or under the Act or by a condition of this licence, any methodology approved in writing by the EPA for the purposes of that testing prior to the testing taking place.

## M4 Recording of pollution complaints

M4.1 The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.

M4.2 The record must include details of the following:
a) the date and time of the complaint;
b) the method by which the complaint was made;
c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
d) the nature of the complaint;
e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and
f) if no action was taken by the licensee, the reasons why no action was taken.

M4.3 The record of a complaint must be kept for at least 4 years after the complaint was made.

M4.4 The record must be produced to any authorised officer of the EPA who asks to see them.

## M5 Telephone complaints line

M5.1 The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.

M5.2 The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.

M5.3 The preceding two conditions do not apply until 3 months after: the date of the issue of this licence.

## M6 Blasting

M6.1 The licensee must monitor all blasts carried out in or on the premises at or near the nearest residence or noise sensitive location (such as a school or hospital) that is likely to be most affected by the blast and that is not owned by the licensee or subject of a private agreement between the owner of the residence or noise sensitive location and the licensee relating to alternative blasting limits.

# Environment Protection Licence

Licence - 11569

## 6 Reporting Conditions

### R1 Annual return documents

R1.1 The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:
1. a Statement of Compliance,
2. a Monitoring and Complaints Summary,
3. a Statement of Compliance - Licence Conditions,
4. a Statement of Compliance - Load based Fee,
5. a Statement of Compliance - Requirement to Prepare Pollution Incident Response Management Plan,
6. a Statement of Compliance - Requirement to Publish Pollution Monitoring Data; and
7. a Statement of Compliance - Environmental Management Systems and Practices.

At the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be completed and returned to the EPA.

R1.2 An Annual Return must be prepared in respect of each reporting period, except as provided below.

Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period.

R1.3 Where this licence is transferred from the licensee to a new licensee:
a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and
b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period.

Note: An application to transfer a licence must be made in the approved form for this purpose.

R1.4 Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and ending on:
a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or
b) in relation to the revocation of the licence - the date from which notice revoking the licence operates.

R1.5 The Annual Return for the reporting period must be supplied to the EPA via eConnect *EPA* or by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').

R1.6 The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.

R1.7 Within the Annual Return, the Statements of Compliance must be certified and the Monitoring and Complaints Summary must be signed by:
a) the licence holder; or
b) by a person approved in writing by the EPA to sign on behalf of the licence holder.

# Environment Protection Licence

Licence - 11569

## R2 Notification of environmental harm

R2.1 Notifications must be made by telephoning the Environment Line service on 131 555.

R2.2 The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.

Note: The licensee or its employees must notify all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.

## R3 Written report

R3.1 Where an authorised officer of the EPA suspects on reasonable grounds that:
a) where this licence applies to premises, an event has occurred at the premises; or
b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence,
and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.

R3.2 The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.

R3.3 The request may require a report which includes any or all of the following information:
a) the cause, time and duration of the event;
b) the type, volume and concentration of every pollutant discharged as a result of the event;
c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event;
d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort;
e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants;
f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and
g) any other relevant matters.

R3.4 The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.

## R4 Other reporting conditions

R4.1 The licensee must report any exceedence of the licence blasting limits to the regional office of the EPA as soon as practicable after the exceedence becomes known to the licensee or to one of the licensee's

employees or agents.

R4.2 **Blast Monitoring Report**

The licensee must supply, with each Annual Return, a Blast Monitoring Report which must include the following information relating to each blast carried out within the premises during the reporting period covered by the Annual Return:
a) the date and time of the blast;
b) the location of the blast on the premises;
c) the blast monitoring results at each blast monitoring station; and
d) an explanation for any missing blast monitoring results.

# 7 General Conditions

## G1 Copy of licence kept at the premises or plant

G1.1 A copy of this licence must be kept at the premises to which the licence applies.

G1.2 The licence must be produced to any authorised officer of the EPA who asks to see it.

G1.3 The licence must be available for inspection by any employee or agent of the licensee working at the premises.

# Environment Protection Licence

Licence - 11569

## Dictionary

### General Dictionary

| | |
|---|---|
| **3DGM [in relation to a concentration limit]** | Means the three day geometric mean, which is calculated by multiplying the results of the analysis of three samples collected on consecutive days and then taking the cubed root of that amount. Where one or more of the samples is zero or below the detection limit for the analysis, then 1 or the detection limit respectively should be used in place of those samples |
| **Act** | Means the Protection of the Environment Operations Act 1997 |
| **activity** | Means a scheduled or non-scheduled activity within the meaning of the Protection of the Environment Operations Act 1997 |
| **actual load** | Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009 |
| **AM** | Together with a number, means an ambient air monitoring method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*. |
| **AMG** | Australian Map Grid |
| **anniversary date** | The anniversary date is the anniversary each year of the date of issue of the licence. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act. |
| **annual return** | Is defined in R1.1 |
| **Approved Methods Publication** | Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009 |
| **assessable pollutants** | Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009 |
| **BOD** | Means biochemical oxygen demand |
| **CEM** | Together with a number, means a continuous emission monitoring method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*. |
| **COD** | Means chemical oxygen demand |
| **composite sample** | Unless otherwise specifically approved in writing by the EPA, a sample consisting of 24 individual samples collected at hourly intervals and each having an equivalent volume. |
| **cond.** | Means conductivity |
| **environment** | Has the same meaning as in the Protection of the Environment Operations Act 1997 |
| **environment protection legislation** | Has the same meaning as in the Protection of the Environment Administration Act 1991 |
| **EPA** | Means Environment Protection Authority of New South Wales. |
| **fee-based activity classification** | Means the numbered short descriptions in Schedule 1 of the Protection of the Environment Operations (General) Regulation 2009. |
| **general solid waste (non-putrescible)** | Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997 |

# Environment Protection Licence

Licence - 11569

| | |
|---|---|
| **flow weighted composite sample** | Means a sample whose composites are sized in proportion to the flow at each composites time of collection. |
| **general solid waste (putrescible)** | Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environmen t Operations Act 1997 |
| **grab sample** | Means a single sample taken at a point at a single time |
| **hazardous waste** | Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997 |
| **licensee** | Means the licence holder describe d at the front of this licence |
| **load calculation protocol** | Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009 |
| **local authority** | Has the same meaning as in the Protection of the Environment Operations Act 1997 |
| **material harm** | Has the same meaning as in section 147 Protection of the Environment Operations Act 1997 |
| **MBAS** | Means methylene blue active substances |
| **Minister** | Means the Minister administering the Protection of the Environment Operations Act 1997 |
| **mobile plant** | Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997 |
| **motor vehicle** | Has the same meaning as in the Protection of the Environment Operations Act 1997 |
| **O&G** | Means oil and grease |
| **percentile [in relation to a concentration limit of a sample]** | Means that percentage [eg.50%] of the number of samples taken that must meet the concentration limit specified in the licence for that pollutant over a specified period of time. In this licence, the specified period of time is the Reporting Period unless otherwise stated in this licence. |
| **plant** | Includes all plant within the meaning of the Protection of the Environment Operations Act 1997 as well as motor vehicles. |
| **pollution of waters [or water pollution]** | Has the same meaning as in the Protection of the Environment Operations Act 1997 |
| **premises** | Means the premises described in condition A2.1 |
| **public authority** | Has the same meaning as in the Protection of the Environment Operations Act 1997 |
| **regional office** | Means the relevant EPA office referred to in the Contacting the EPA document accompanying this licence |
| **reporting period** | For the purposes of this licence, the reporting period means the period of 12 months after the issue of the licence, and each subsequent period of 12 mo nths. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act. |
| **restricted solid waste** | Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997 |
| **scheduled activity** | Means an activity listed in Schedule 1 of the Protection of the Environment Operations Act 1997 |
| **special waste** | Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997 |
| **TM** | Together with a number, means a test method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*. |

# Environment Protection Licence

Licence - 11569

| | |
|---|---|
| **TSP** | Means total suspended particles |
| **TSS** | Means total suspended solids |
| **Type 1 substance** | Means the elements antimony, arsenic, cadmium, lead or mercury or any compound containing one or more of those elements |
| **Type 2 substance** | Means the elements beryllium, chromium, cobalt, manganese, nickel, selenium, tin or vanadium or any compound containing one or more of those elements |
| **utilisation area** | Means any area shown as a utilisation area on a map submitted with the application for this licence |
| **waste** | Has the same meaning as in the Protection of the Environment Operations Act 1997 |
| **waste type** | Means liquid, restricted solid waste, general solid waste (putrescible), general solid waste (non-putrescible), special waste or hazardous waste |

Ms Michelle Bruce

Environment Protection Authority

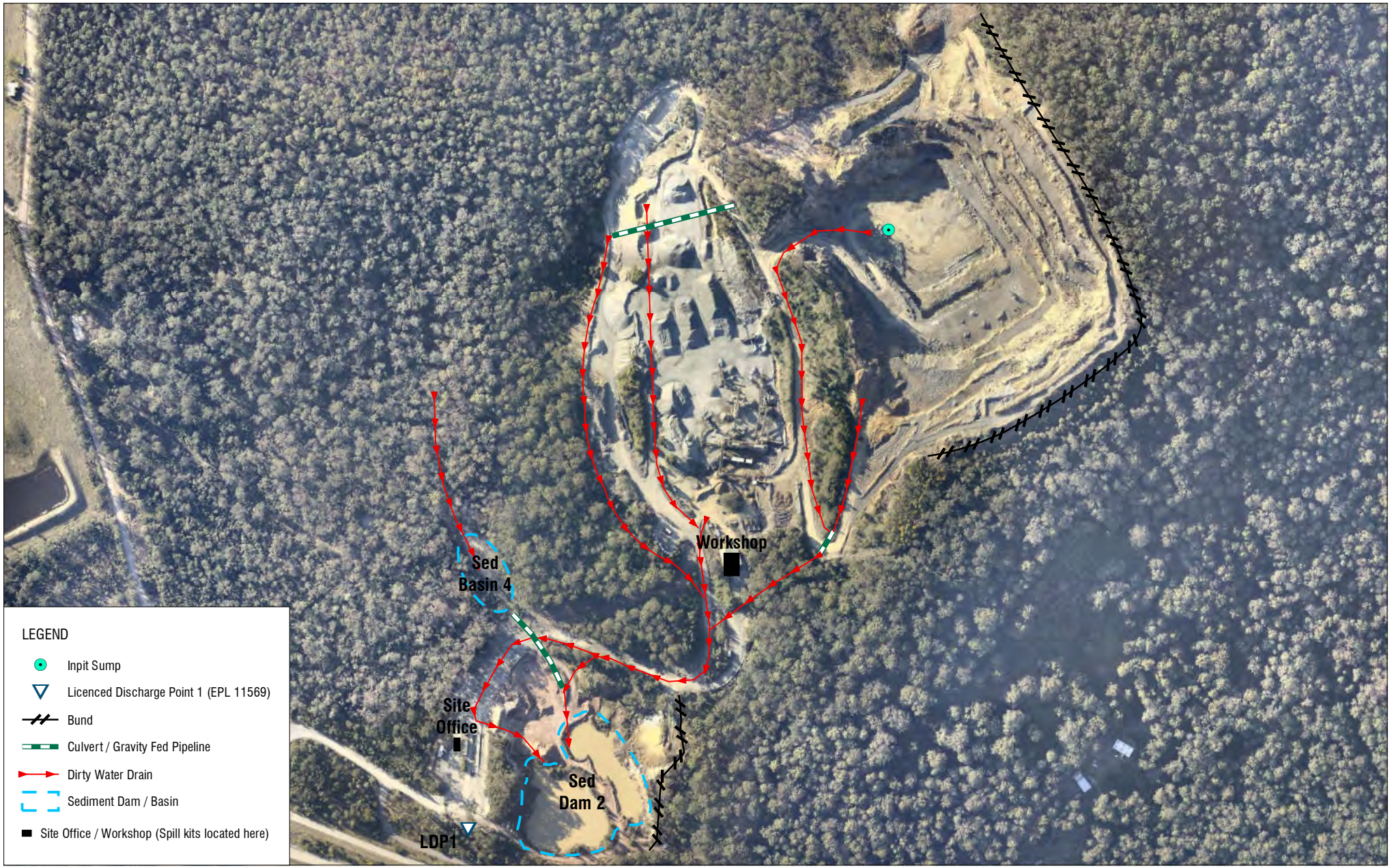
(By Delegation)

Date of this edition: 16-January-2002

## End Notes

| | |
|---|---|
| 1 | Licence varied by notice 1015394, issued on 11-Jul-2002, which came into effect on 05-Aug-2002. |
| 2 | Licence varied by notice 1048149, issued on 30-Jun-2005, which came into effect on 25-Jul-2005. |
| 3 | Licence varied by notice 1061485, issued on 14-Sep-2006, which came into effect on 14-Sep-2006. |
| 4 | Licence varied by notice 1072188, issued on 16-Apr-2007, which came into effect on 16-Apr-2007. |
| 5 | Condition A1.3 Not applicable varied by notice issued on <issue date> which came into effect on <effective date> |
| 6 | Licence varied by notice 1113805, issued on 04-May-2010, which came into effect on 04-May-2010. |
| 7 | Licence varied by notice 1502901 issued on 29-Dec-2011 |
| 8 | Licence varied by notice 1528535 issued on 26-Aug-2016 |

# APPENDIX 3 – Water Management Figure

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| | |
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| Project No.: | 633.HQP00.003 |
| Date: | 12/12/2014 |
| Drawn by: | LH |
| Scale: | 1:5,000 |
| Sheet Size: | A4 |
| Projection: | GDA 1994 MGA Zone 56 |

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Hunter Quarries Pty Ltd

Environmental Services and Support

**Quarry Operations**
**Water Management**

FIGURE 1

# APPENDIX 4 – Environmental Monitoring Locations and Figures


Sheet Size : A4

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**Karuah Hard Rock Quarry**
**Environmental Monitoring Locations**

**FIGURE 1**

# APPENDIX 5 – Noise Monitoring Reports

# KARUAH QUARRY

## Biannual Noise Monitoring Assessment
## May 2018

**Prepared for:**

Hunter Quarries Pty Ltd
PO Box 3284
THORNTON NSW 2322

**SLR Ref: 630.01541-R24**
**Version No: -v0.1**
**June 2018**

# PREPARED BY

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# BASIS OF REPORT

This report has been prepared by SLR Consulting Australia Pty Ltd with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Hunter Quarries Pty Ltd (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

# DOCUMENT CONTROL

| Reference | Date | Prepared | Checked | Authorised |
|---|---|---|---|---|
| 630.01541-R24-v1.0 | 4 March 2019 | Jordan Murray | Robert Hall | Robert Hall |
| | | | | |
| | | | | |
| | | | | |
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## APPENDICES

# 1 Introduction

## 1.1 Background

Hunter Quarries Pty Ltd (Hunter Quarries) has operated a hard rock quarry approximately four (4) kilometres north of Karuah since 1997. In October 2004, Hunter Quarries applied to the Department of Planning and Infrastructure (DP&I) for approval to expand the quarry. The Minister for Planning granted development consent on 3 June 2005 (DA 265-10-2004).

Hunter Quarries has commissioned SLR Consulting Australia Pty Ltd (SLR) to prepare and implement a noise monitoring program for the Karuah Quarry in accordance with the conditions of consent specified by DP&I.

## 1.2 Objectives of this Report

The noise monitoring program requires biannual noise monitoring surveys. This report presents the results of the noise monitoring survey for the period up to May 2018.

The objectives of the noise monitoring survey for this operating period were as follows:

- Measure the ambient noise levels at four (4) key focus receptor locations surrounding the quarry.
- Qualify all sources of noise within each of the attended surveys, including estimated contribution or maximum level of individual noise sources.
- Assess the noise emissions of Karuah Quarry with respect to the limits contained in the Development Consent.

## 1.3 Acoustics Terminology

The following report uses specialist acoustic terminology. An explanation of common terms is provided in **Appendix A.**

# 2 Karuah Quarry Development Consent Conditions

Development Consent Section 5.4.1, Schedule 4, Condition 3 provides the following:

*Within 6 months of the date of this consent, the Applicant shall prepare and implement a Noise Monitoring Program, for the development to evaluate compliance with the noise impact assessment criteria in this consent, in consultation with the DEC, and to the satisfaction of the Director-General.*

Condition 1 of the Development Consent requires Hunter Quarries to ensure noise generated by the development does not exceed criteria outlined in **Table 1** at any residence, or any noise sensitive receptor on privately owned land.

**Table 1 Development Consent Noise Impact Criteria – Karuah Quarry**

| Time Period | Noise Limit (dBA) - $L_{Aeq(15minute)}$ |
|---|---|
| Day<br>7:00am to 6:00pm Monday to Friday<br>7:00am to 1:00pm Saturday | 48 |
| Evening<br>6:00pm to 10:00pm Monday to Friday | 47 |
| At All Other Times | 46 |

# 3 Equipment operation

Hours of operation of the Karuah Quarry are from 7:00 am to 5:00 pm Monday to Friday and 7:00 am to 12:00 pm Saturday.

Equipment operating hours for Karuah Quarry during the noise monitoring period are presented in **Table 2**.

**Table 2 Karuah Quarry Equipment Operation**

| Equipment Description | Weekday Operation, Monday – Friday (7:00 am – 5:00 pm) | Weekend Operation, Saturday (7:00 am – 12:00 pm) |
|---|---|---|
| Front End loader – Komatsu WA 470 | ✓ | ✓ |
| Front End loader – CAT 980G | ✓ | ✓ |
| Excavator | ✓ | ✓ |
| Jaw Crusher | ✓ | ✓ |
| Primary Screen | ✓ | ✓ |
| Secondary Crusher/Screen | ✓ | ✓ |
| Dump Trucks | ✓ | ✓ |

# 4 Noise Monitoring Methodology

## 4.1 General Requirements

The operational noise monitoring programme was conducted with reference to Development Consent DA 265-10-2004, AS 1055-1997 "*Acoustics - Description and Measurement of Environmental Noise*" and the NSW *Industrial Noise Policy* (INP).

All acoustic instrumentation employed throughout the monitoring programme has been designed to comply with the requirements of AS IEC 61672 (parts 1 and 2) 2004 *Electroacoustics - Sound Level Meters* and carries current NATA or manufacturer calibration certificates. Instrument calibration was checked before and after each measurement survey, with the variation in calibrated levels not exceeding ±0.5 dBA.

## 4.2 Monitoring Location

The Karuah Quarry is located just north of Karuah adjacent to the Pacific Highway. The Pacific Highway is situated between residences and Karuah Quarry.

Operator-attended and unattended continuous noise monitoring was conducted at the three (3) nearest residences to the Karuah Quarry as presented in **Table 3** and shown in **Figure 1**.

**Table 3 Residential monitoring locations**

| Noise Monitoring Location | Property Name | Distance from Karuah Quarry |
|---|---|---|
| NM1 | Lot 3 DP785172<br>5772 Pacific Hwy, Karuah | 317 metres South of the Karuah Quarry |
| NM2 | Lot 2 DP 785172<br>5760 Pacific Hwy, Karuah | 200 metres South of the Karuah Quarry |
| NM3 | Lot 22 DP 1024341 | 370 metres South-West of the Karuah Quarry |

### 4.2.1 Additional Noise Monitoring Location

Noise monitoring was also undertaken at 1714 Branch Lane, Karuah (Location F) in response to the following comment from the NSW Department of Planning and Environment (DP&E) on the 2015 Annual Review:

> *Further, please undertake noise monitoring to confirm compliance with Condition 1, Schedule 3, which requires that the noise generated by the development does not exceed criteria at any residence on privately owned land, including the residence at 1714 Branch Lane, Karuah.*

Noise monitoring Location F is shown in **Figure 2**.

## Figure 1 Noise Monitoring Locations

**Figure 2 Location F Noise Monitoring Location**


## 4.3 Operator-attended Noise Surveys

An operator-attended noise survey was conducted at each of the four (4) monitoring locations (refer to **Figure 1** and **Figure 2**) on Thursday 17 May 2018. The purpose of the noise surveys was to verify the unattended logging results and to determine the character and contribution of noise sources to the total ambient noise level.

All acoustic instrumentation employed throughout the monitoring programme has been designed to comply with the requirements of AS IEC 61672.1 – 2004 *Electroacoustics—Sound level meters – Specifications*, AS IEC 61672.2-2004, AS IEC 61672.3-2004 and carried current NATA or manufacturer calibration certificates. Instrument calibration was checked before and after each measurement survey, with the variation in calibrated levels not exceeding ±0.5 dBA.

The instrument used for the operator attended surveys was a SVAN 957 Sound Level Meter (s/n 27522).

## 4.4 Unattended Continuous Monitoring

Environmental noise loggers were deployed at monitoring location NM1, NM2, and NM3 (refer to **Figure 1** and **Figure 2**) however due to an unexplained equipment failure no data was available for NM2. For each location, noise monitoring was undertaken from Saturday 5 May 2018 to Thursday 17 May 2018 inclusive. Details of the noise loggers used for unattended continuous noise monitoring are given in **Table 4**.

The environmental noise loggers were programmed to record statistical noise level indices continuously in 15 minute intervals.

**Table 4 Noise Logger and Noise Monitoring Location**

| Location | Noise Logger Serial Number | Date of Logging |
|---|---|---|
| NM1 | ARL EL-316 16-203-530 | 05/05/2018-17/05/2018 |
| NM2 | ARL EL-316 16-203-524 | 05/05/2018-17/05/2018 |
| NM3 | ARL EL-316 16-306-039 | 05/05/2018-17/05/2018 |

# 5 Operator Attended Noise Monitoring

## 5.1 Results of Operator-attended Noise Monitoring

The results of operator-attended noise monitoring are presented in **Table 5**.

Ambient noise levels given in the tables include all noise sources such as traffic, insects, birds, construction activities and quarry operations. The table provides the following information:

- Monitoring location
- Date, start time, Wind velocity (m/s) and Temperature (ºC) at the measurement location; and
- Typical maximum ($L_{Amax}$) and contributed noise levels.

Quarry contributions listed in the tables are from Karuah Quarry and are stated only when a contribution could be quantified.

**Table 5 Operator Attended Noise Survey Results**

| Location | Date/ Start time/ Period/ Weather | Primary Noise Descriptor (dBA re 20 µPa) | | | | | Description of Noise Emission, Typical Maximum Levels $L_{Amax}$ |
|---|---|---|---|---|---|---|---|
| | | $L_{Amax}$ | $L_{A1}$ | $L_{A10}$ | $L_{A90}$ | $L_{Aeq}$ | |
| NM1 | 17/5/2018<br>11:18<br>Day<br>1 m/s S<br>18°C | 75 | 72 | 67 | 57 | 64 | Pacific Highway traffic 50 – 75<br>Birds 40 – 53<br><br>**Karuah Quarry Inaudible** |
| NM2 | 17/5/2018<br>11:35<br>Day<br>1 m/s SE<br>19°C | 72 | 69 | 63 | 53 | 60 | Pacific Highway traffic 55 – 70<br>Frogs 46 – 48<br><br>**Karuah Quarry Inaudible** |
| NM3 | 17/5/2018<br>11:59<br>Day<br>1 m/s SSE<br>19°C | 69 | 65 | 59 | 49 | 56 | Pacific Highway traffic 47 – 69<br>Local traffic 58 – 61<br>Birds 43 – 45<br><br>**Karuah Quarry Inaudible** |

| Location | Date/ Start time/ Period/ | Primary Noise Descriptor (dBA re 20 μPa) | | | | | Description of Noise Emission, Typical |
|---|---|---|---|---|---|---|---|
| F | 17/5/2018<br>12:22<br>Day<br>1 m/s SSE<br>20°C | 78 | 62 | 53 | 43 | 53 | Pacific Highway traffic 46 – 55<br>Local traffic 60 – 78<br>Birds 49 – 53<br><br>**Karuah Quarry Inaudible** |

## 5.2 Operator-attended Noise Monitoring Summary

Noise generated by traffic on the Pacific Highway and insect noise dominated ambient noise levels at noise monitoring locations NM1, NM2 and NM3. Noise generated by traffic on the Pacific Highway and Branch Lane dominated ambient noise levels at noise monitoring location F.

The quarry was inaudible and unmeasurable at NM1, NM2 and NM3 monitoring locations due to high ambient noise levels from Pacific Highway traffic. Quarry operations were audible at monitoring Location F during lulls in ambient noise levels.

Results of the operational compliance assessment are given in **Table 6**.

**Table 6 Compliance Noise Assessment – Operations**

| Location | Estimated Karuah $L_{Aeq(15minute)}$ Contribution | Consent Conditions $L_{Aeq(15minute)}$ | Compliance |
|---|---|---|---|
| | **Day** | **Day** | **Day** |
| NM1 | Inaudible at all times | 48 | Yes |
| NM2 | Inaudible at all times | 48 | Yes |
| NM3 | Inaudible at all times | 48 | Yes |
| Location F | Inaudible at all times | 48 | Yes |

Based on the operator-attended survey , compliance with the relevant consent conditions was indicated at all noise monitoring locations.

# 6 Unattended Continuous Noise Monitoring

## 6.1 Results of Unattended Continuous Monitoring

The unattended ambient noise logger data from monitoring location NM1, NM2 and NM3 are presented graphically on a daily basis and are attached as **Appendix B**, **Appendix C** and **Appendix D** respectively. A summary of the results of the unattended continuous noise monitoring is given in **Table 7**. The ambient noise level data quantifies the overall noise level at a given location independent of its source or character.

The measured ambient noise levels were divided into three periods representing day, evening and night as defined in the INP. The INP time classifications differ slightly from the conditions of consent in that the INP daytime includes weekends; Saturday 7:00 am to 6:00 pm as well as Sunday 8:00 am to 6:00 pm, whereas the allowable operating conditions include only Saturday 7:00 am to 1:00 pm. The evening time classifications are the same and where the conditions of consent refer to all other times, the INP nominates this as "night".

Precautions were taken to minimise influences from extraneous noise sources (eg optimum placement of the loggers away from creeks, trees, houses, etc), however, not all these sources or their effects can be eliminated. This is particularly the case during the warmer times of year when noise from insects, frogs, birds and other animals can become quite prevalent.

Weather data was obtained from the Bureau of Meteorology automatic weather station located at Williamtown Airport approximately 22 km south west of the monitoring locations. Unattended noise data corresponding with periods of rainfall and/or wind speeds in excess of 5 m/s (approximately 18km/hr) were discarded in accordance with INP data exclusion methodology.

### Table 7 Unattended Continuous Monitoring Ambient Noise Levels

| INP Period | $L_{A1}$ | $L_{A10}$ | $L_{A90}$ | $L_{Aeq}$ |
|---|---|---|---|---|
| **NM1** | | | | |
| Daytime during Operational Hours[1] | 73 | 69 | 56 | 65 |
| Daytime outside Operational Hours[2] | 74 | 70 | 58 | 66 |
| Evening[3] | 75 | 69 | 53 | 66 |
| Night[4] | 74 | 68 | 38 | 63 |
| **NM2** | | | | |
| Daytime during Operational Hours[1] | 68 | 63 | 51 | 60 |
| Daytime outside Operational Hours[2] | 68 | 63 | 51 | 60 |
| Evening[3] | 69 | 64 | 47 | 60 |
| Night[4] | 68 | 62 | 37 | 57 |
| **NM3** | | | | |
| Daytime during Operational Hours[1] | 66 | 62 | 50 | 61 |
| Daytime outside Operational Hours[2] | 66 | 62 | 53 | 59 |
| Evening[3] | 67 | 64 | 50 | 60 |
| Night[4] | 67 | 63 | 39 | 58 |

Note:
1. Daytime - 7.00 am to 5.00 pm Monday to Friday, 8.00 am to 12.00 pm Saturday, not operational on Sunday
2. Daytime - 5.00 pm to 6.00 pm Monday to Friday, 12.00 pm to 6.00 pm Saturday, 8.00 am to 6.00 pm Sunday
3. Evening - 6.00 pm 10.00 pm
4. Night - 10.00 pm to 7.00 am pm Monday to Saturday, 10.00 pm to 8.00 am Sunday.

## 6.2 Unattended Continuous Monitoring Summary

Ambient $L_{A90}$ noise levels during the daytime period at monitoring locations NM1, NM2 and NM3 outside the quarry's operational hours are consistent with those during operational hours. This indicates that the quarry is not the dominant contributor to ambient noise levels during the daytime, consistent with observations made during the operator-attended noise survey. The main contributors to ambient noise levels at all monitoring locations are considered to be traffic along the Pacific Highway and natural sources such as birds and insects.

# 7 Conclusion

SLR was engaged by Hunter Quarries to prepare and implement a noise monitoring program for the Karuah Quarry in accordance with the Conditions of Consent for the operation. This report presents the biannual noise monitoring survey results for the period up to the end of June 2018 in accordance with the noise monitoring program.

Operator-attended and unattended noise monitoring was conducted at the three (3) nearest residences to determine noise levels produced by Karuah Quarry operations. An additional operator-attended noise survey was conducted at Location F as requested by NSW DP&E.

The noise contribution of Karuah Quarry operations was found to be significantly lower than that from road traffic on the Pacific Highway during all operator-attended noise surveys. The noise compliance results presented in **Table 6** indicates that compliance with the relevant consent conditions was achieved at all noise monitoring locations during the operator-attended survey.

Results from the unattended ambient noise measurements conducted at three (3) noise monitoring locations were also consistent with site observations which indicate that the Karuah Quarry is not a major contributor to ambient noise levels at each of these locations during the survey period.

# APPENDIX A

Acoustic Terminology

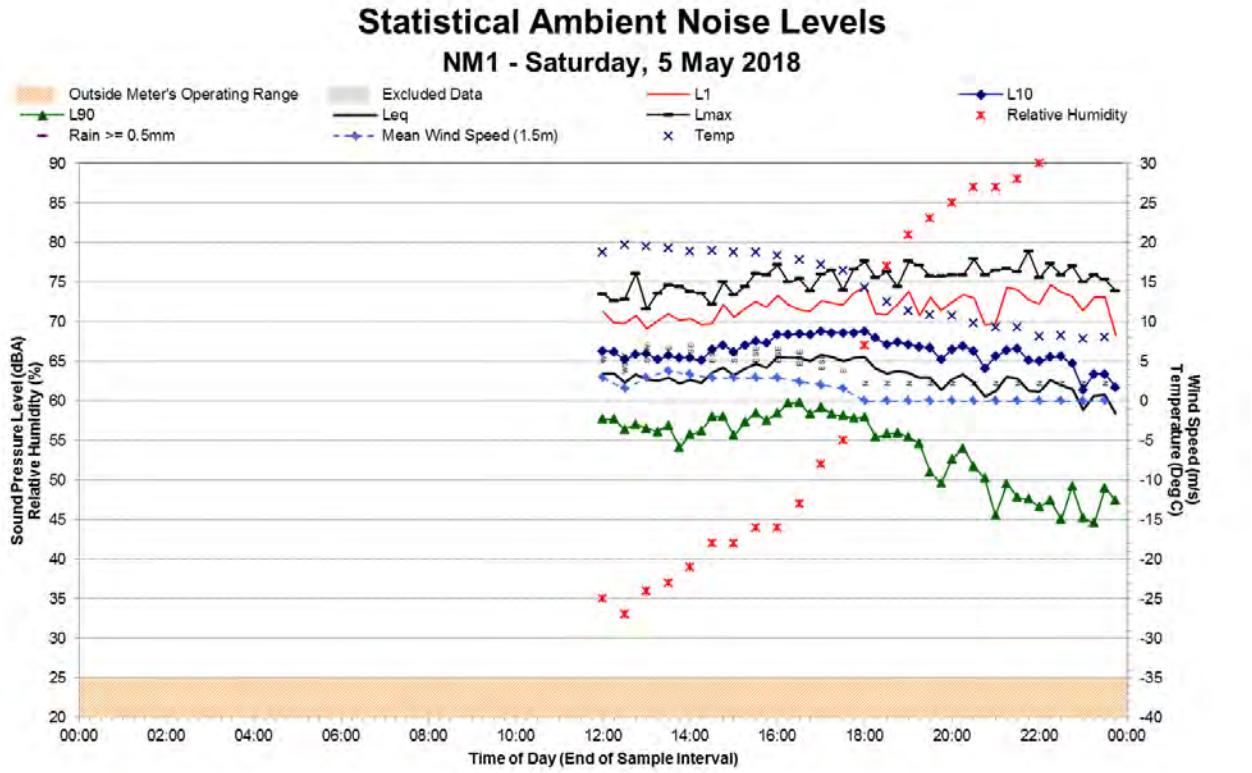
The following is a brief description of the acoustic terminology.

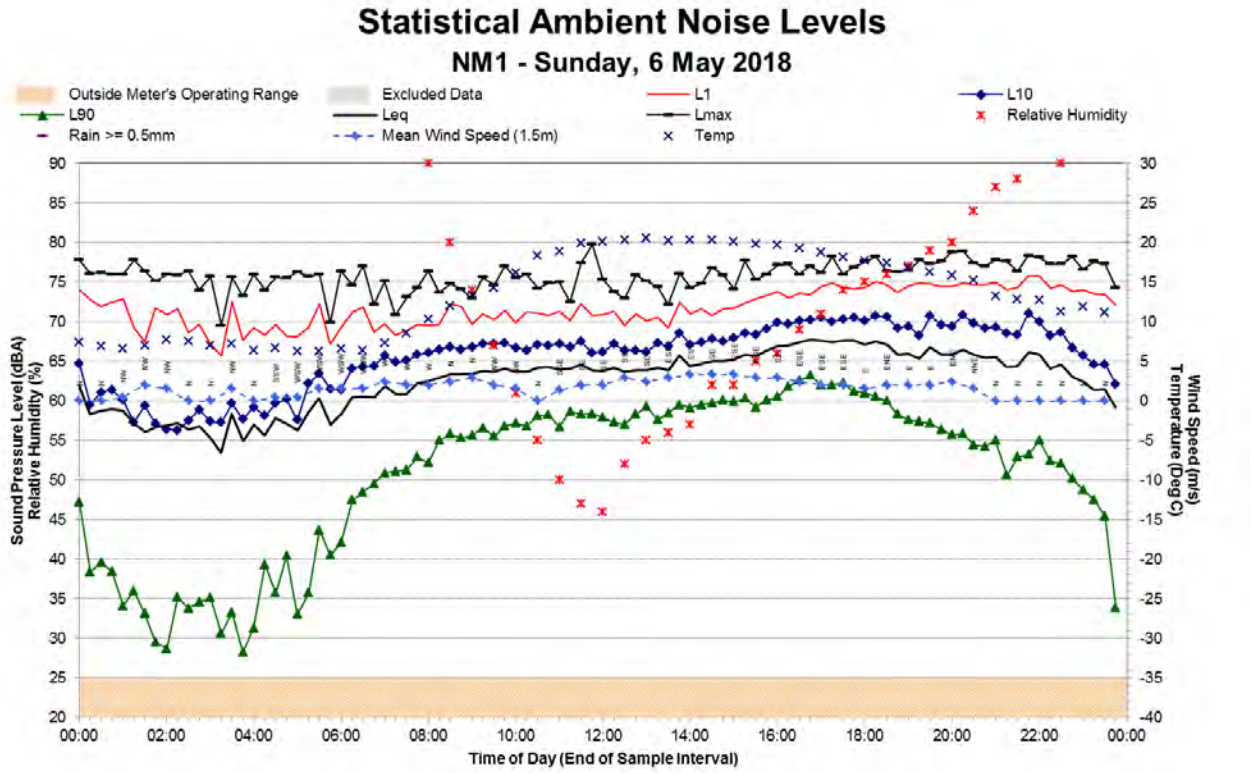
| Acoustic Terminology | Description |
|---|---|
| 'A' Weighted | Frequency filter applied to measured noise levels to represent how humans hear sounds. |
| dBA | 'A' Weighted overall sound pressure level. |
| $L_{90}$ , $L_{10}$, $L_1$ | A statistical measurement giving the sound pressure level which is exceeded for the given percentile of an observation period, i.e., $L_{90}$ is the level which is exceeded for 90 percent of an observation period. $L_{90}$ is commonly referred to as the background sound level. |
| $L_{Amax}$ | Highest value of the A-weighted sound pressure level with a specified time weighting that occurs during a given event. |

# APPENDIX B

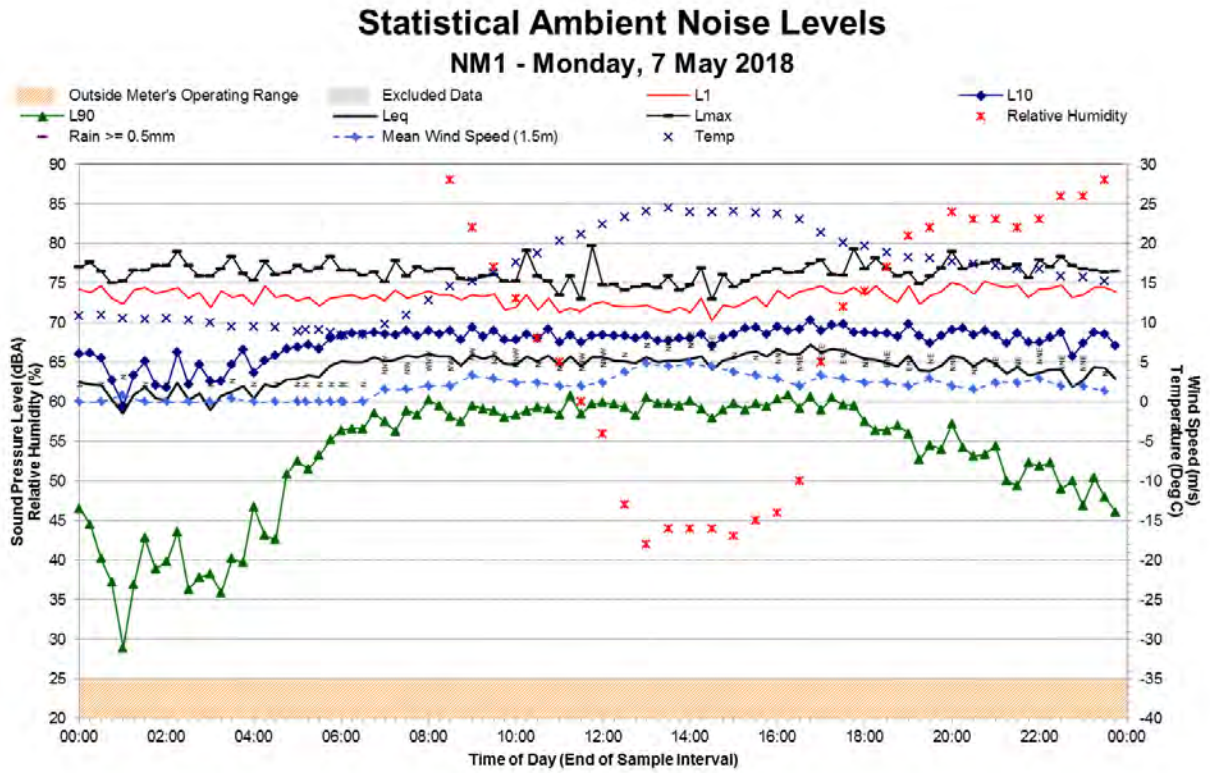
NM1 – Ambient Noise Monitoring Results

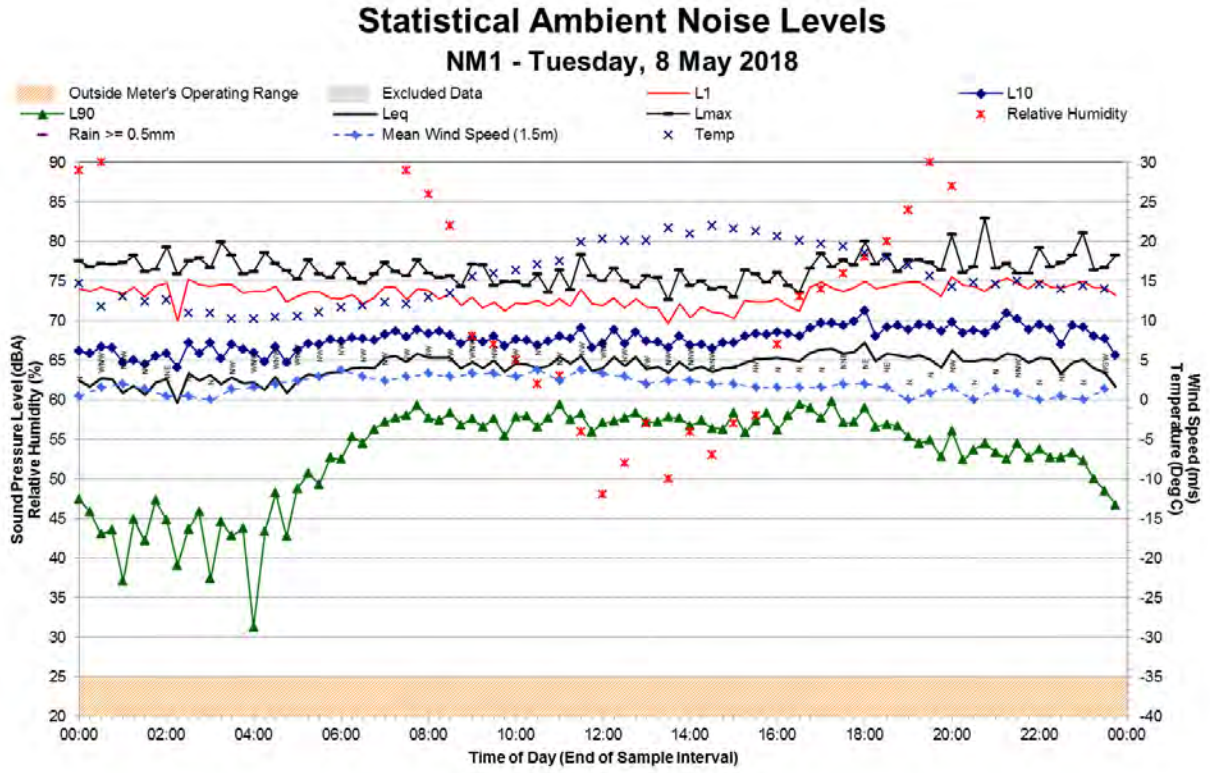
NM1 Continuous Statistical Ambient Noise Monitoring Results



NM1 Continuous Statistical Ambient Noise Monitoring Results



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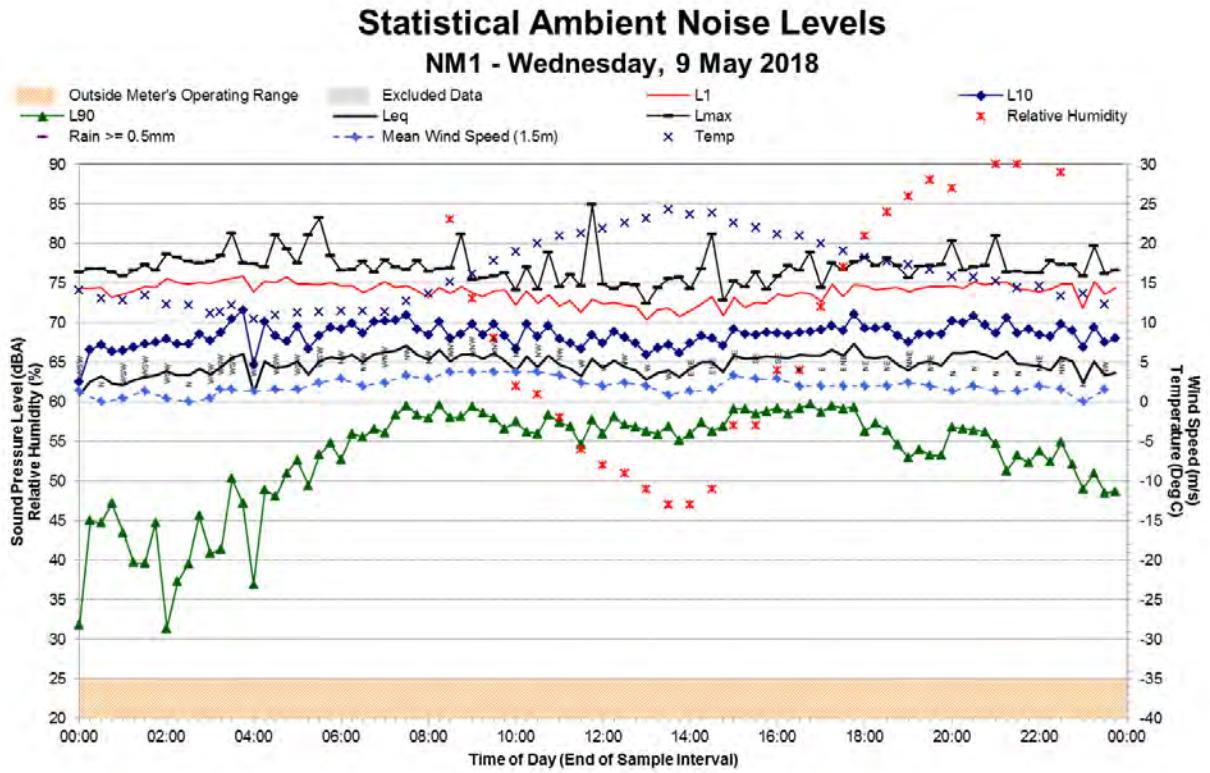


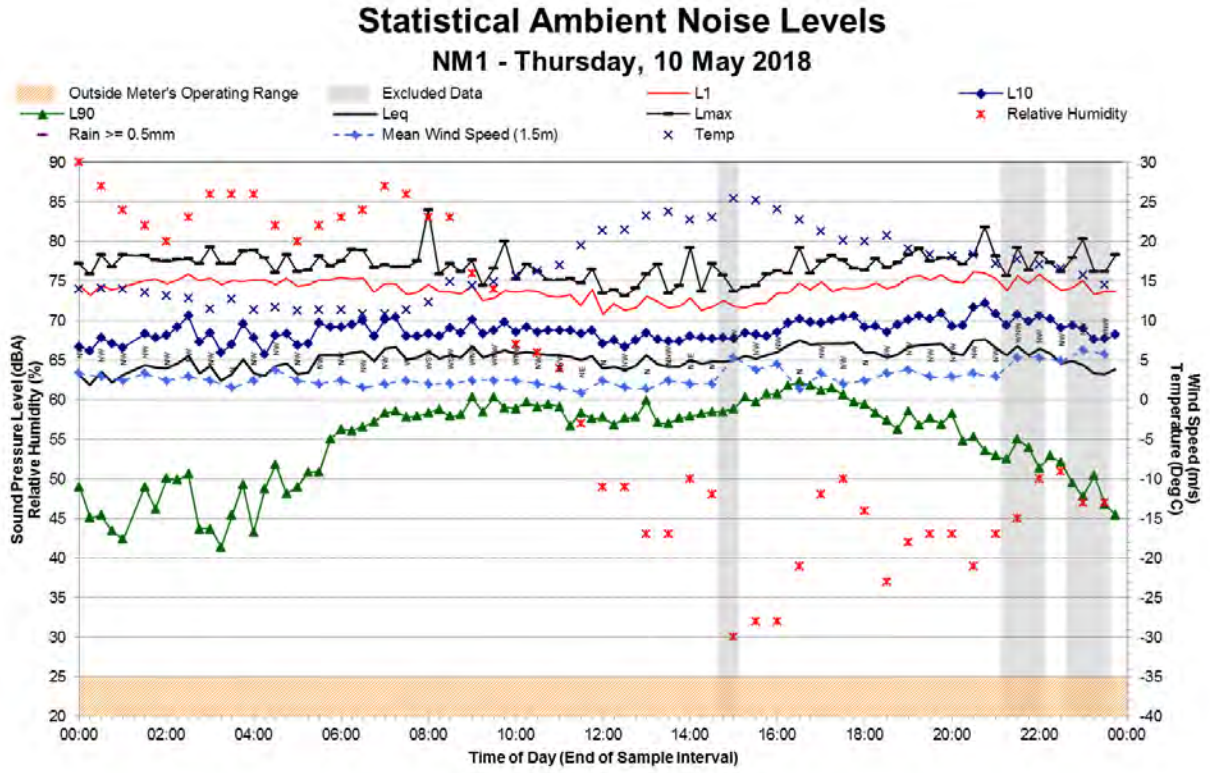

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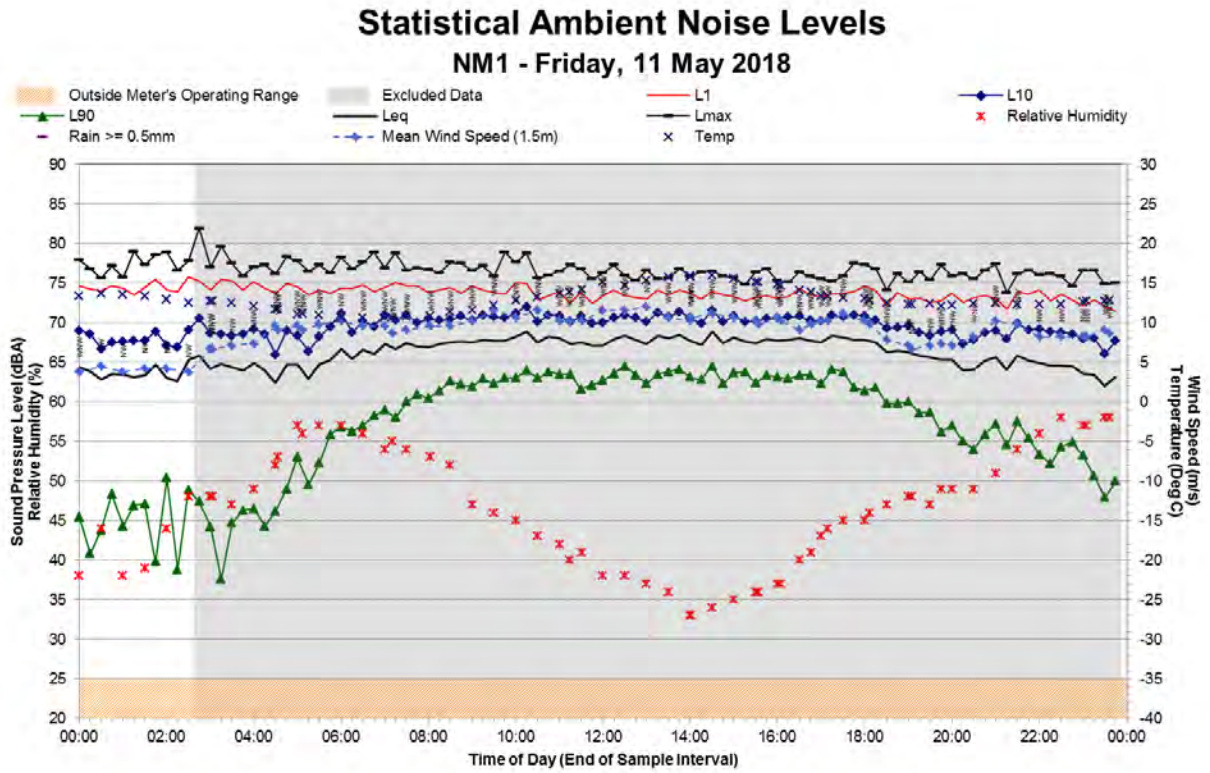


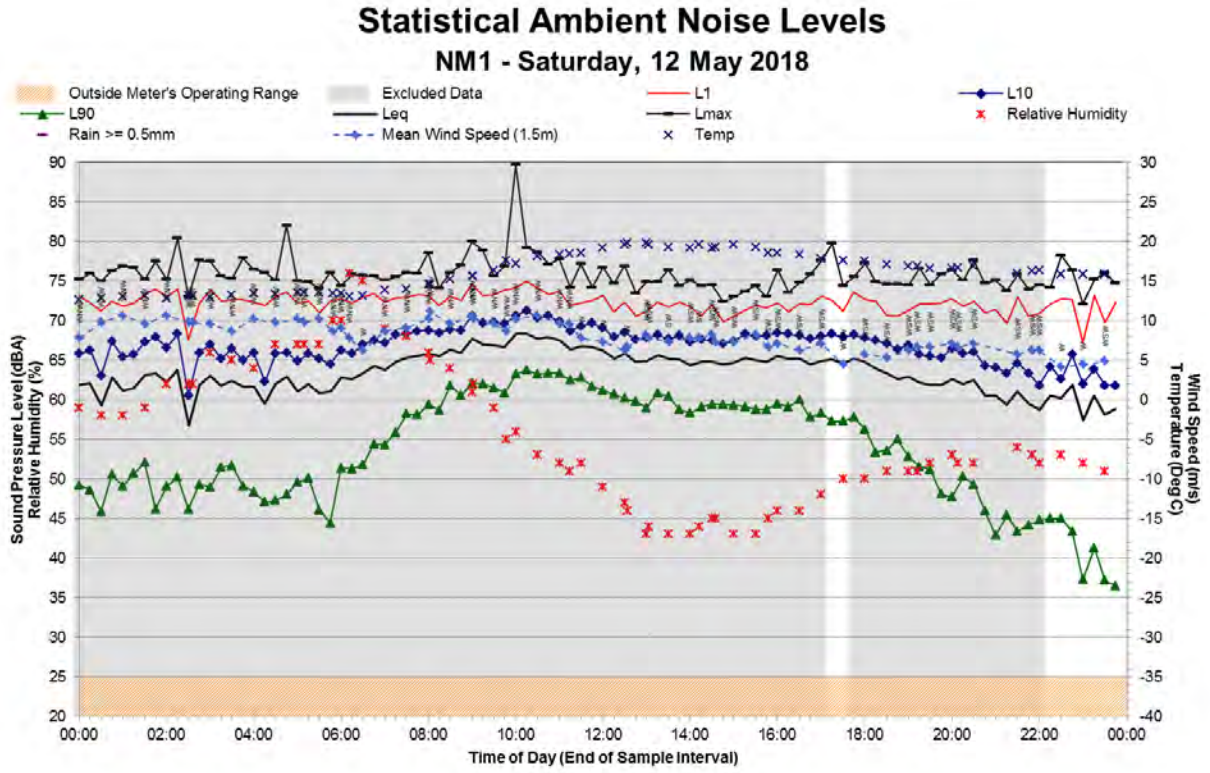

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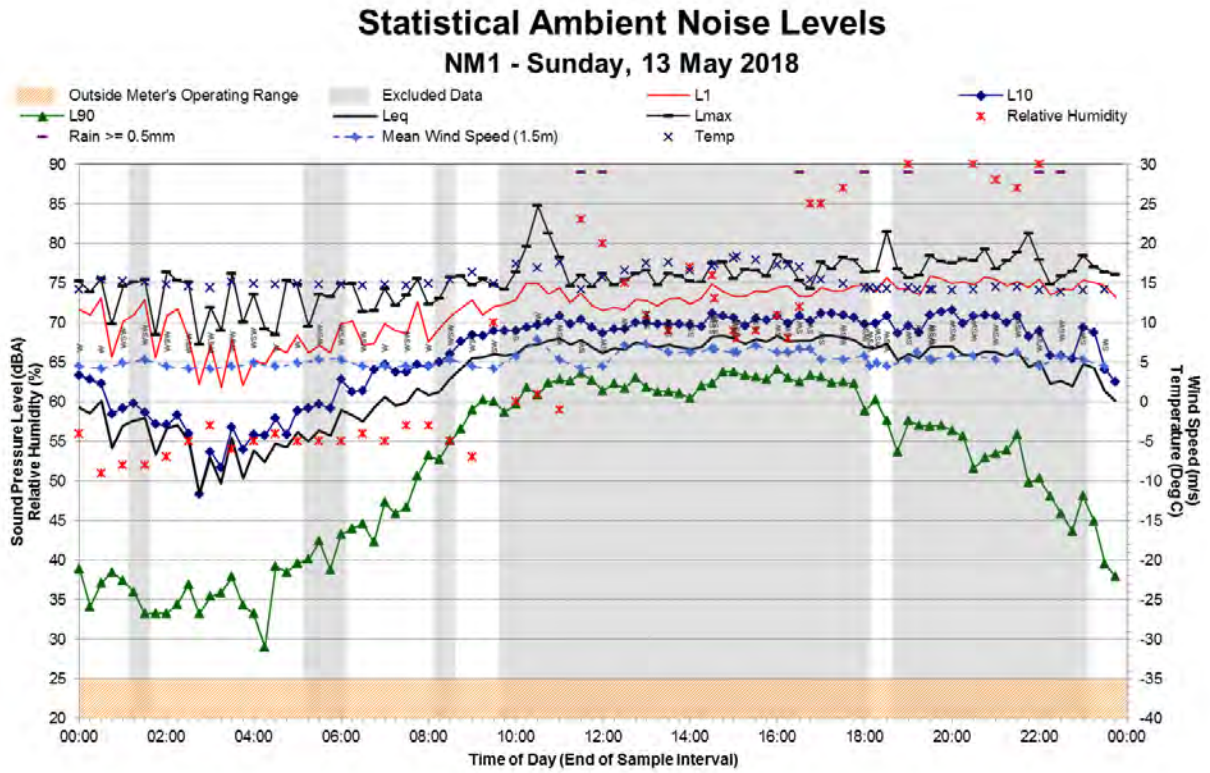
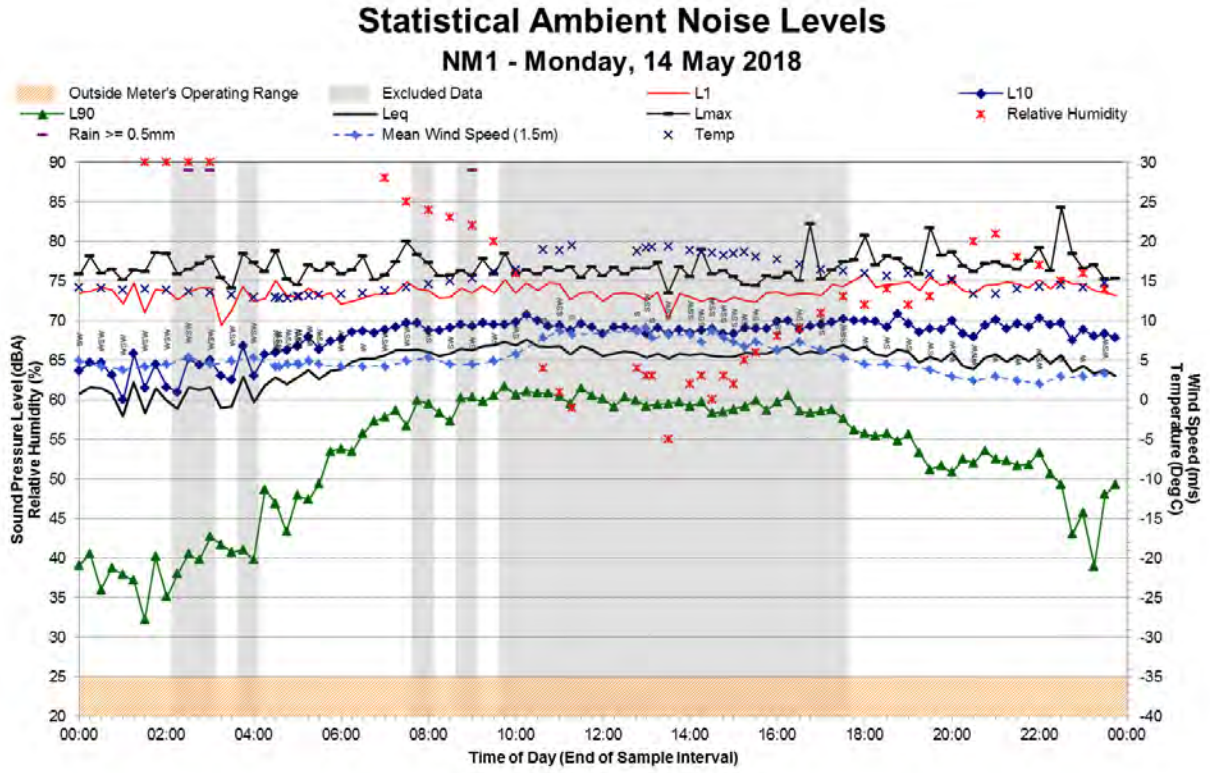
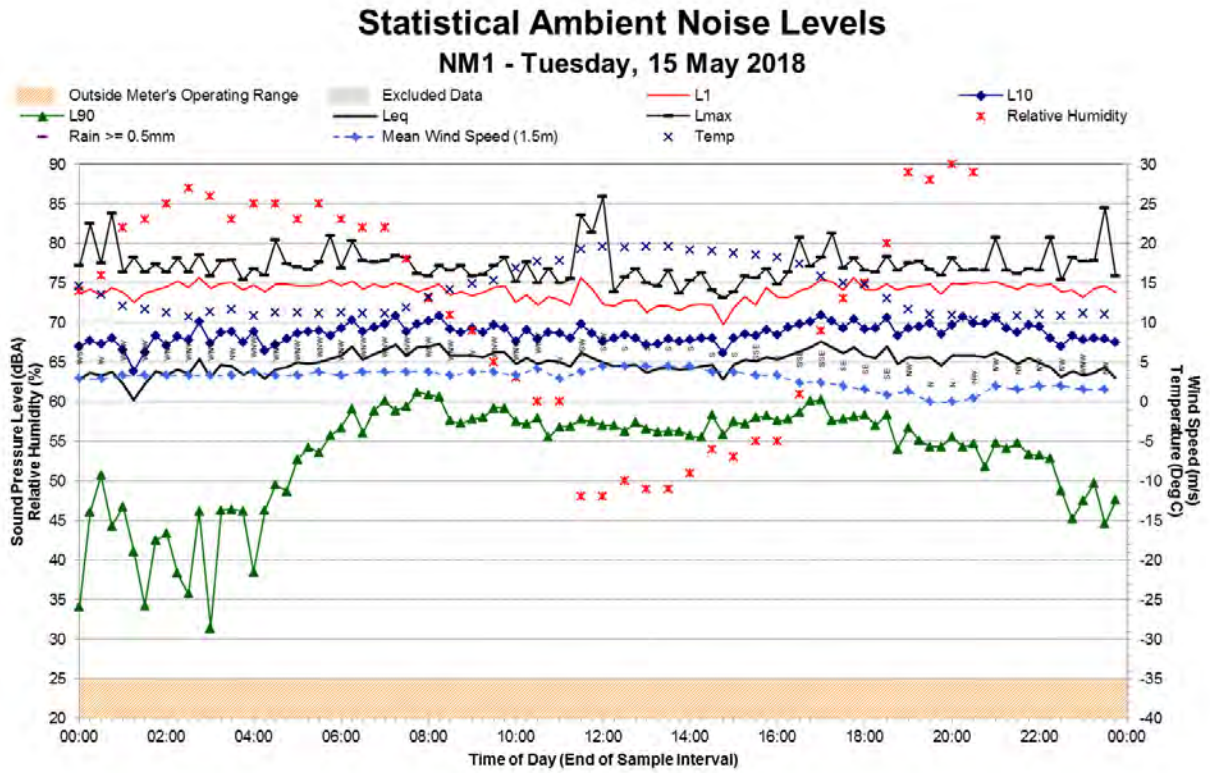
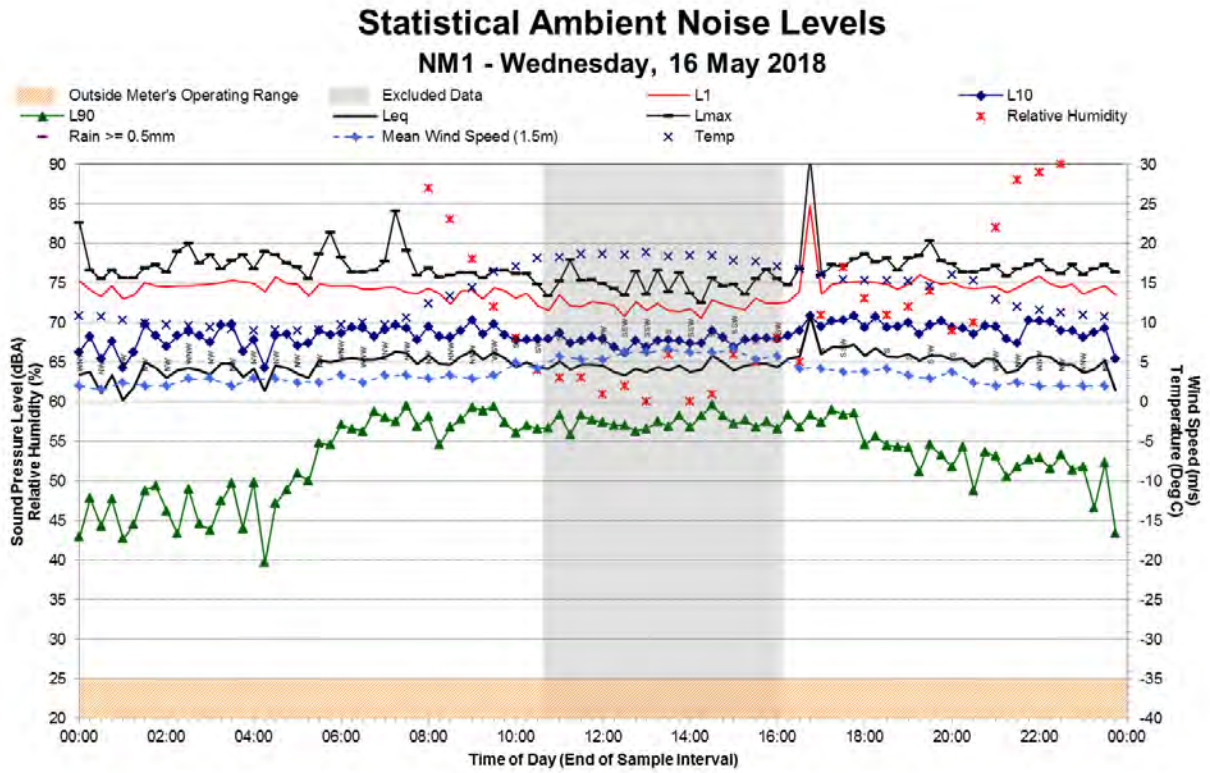
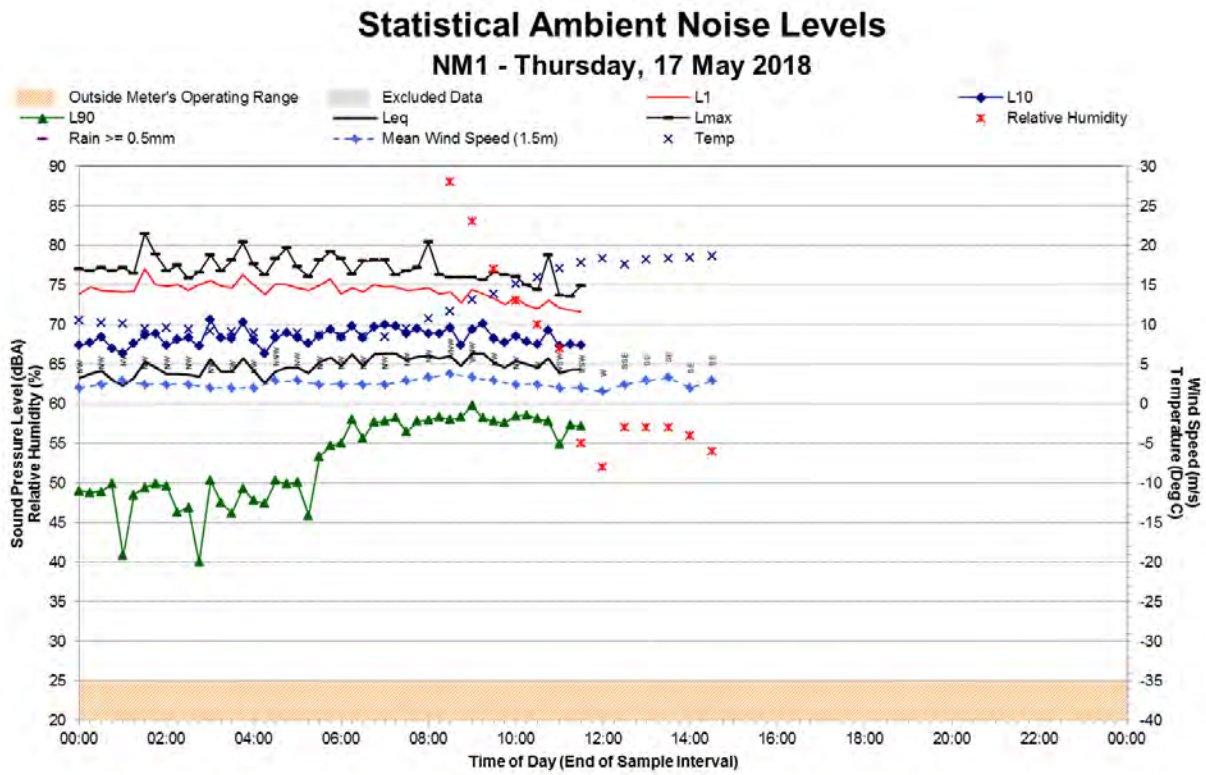



Statistical Ambient Noise Levels
NM1 - Tuesday, 15 May 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Lmax
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
NM1 - Wednesday, 16 May 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Lmax
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)

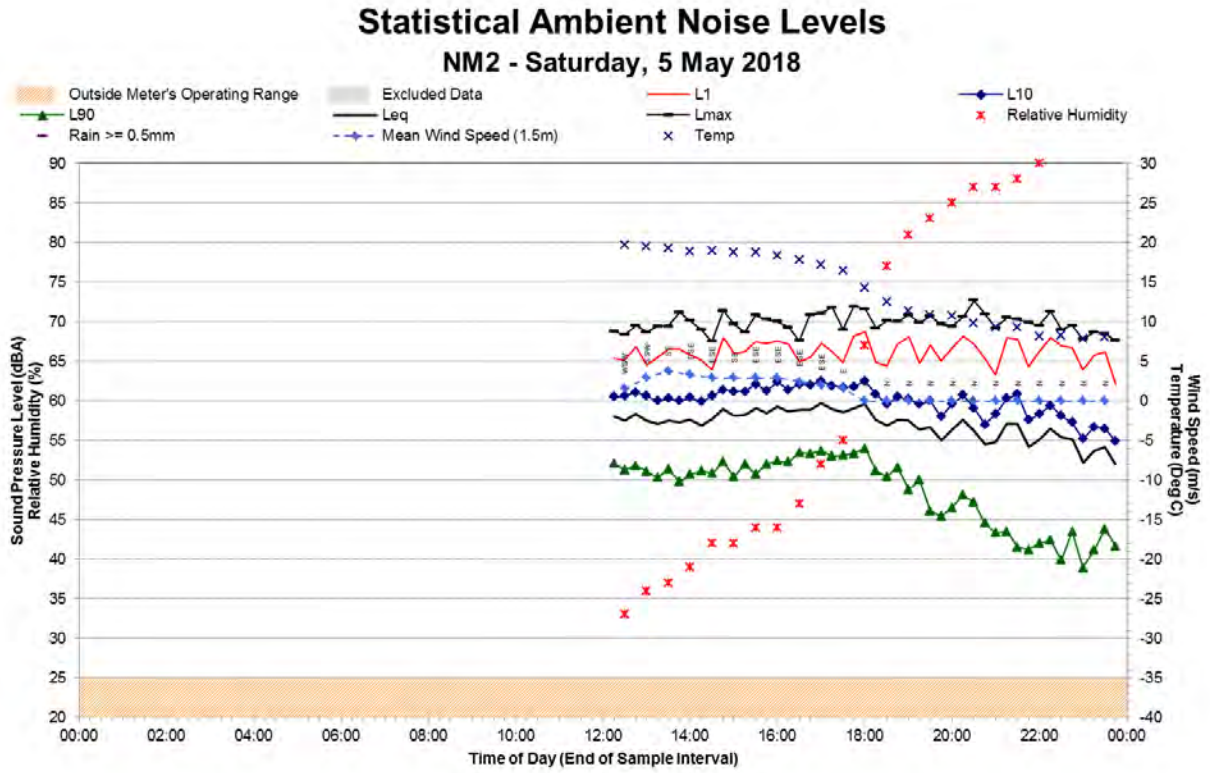
NM1 Continuous Statistical Ambient Noise Monitoring Results

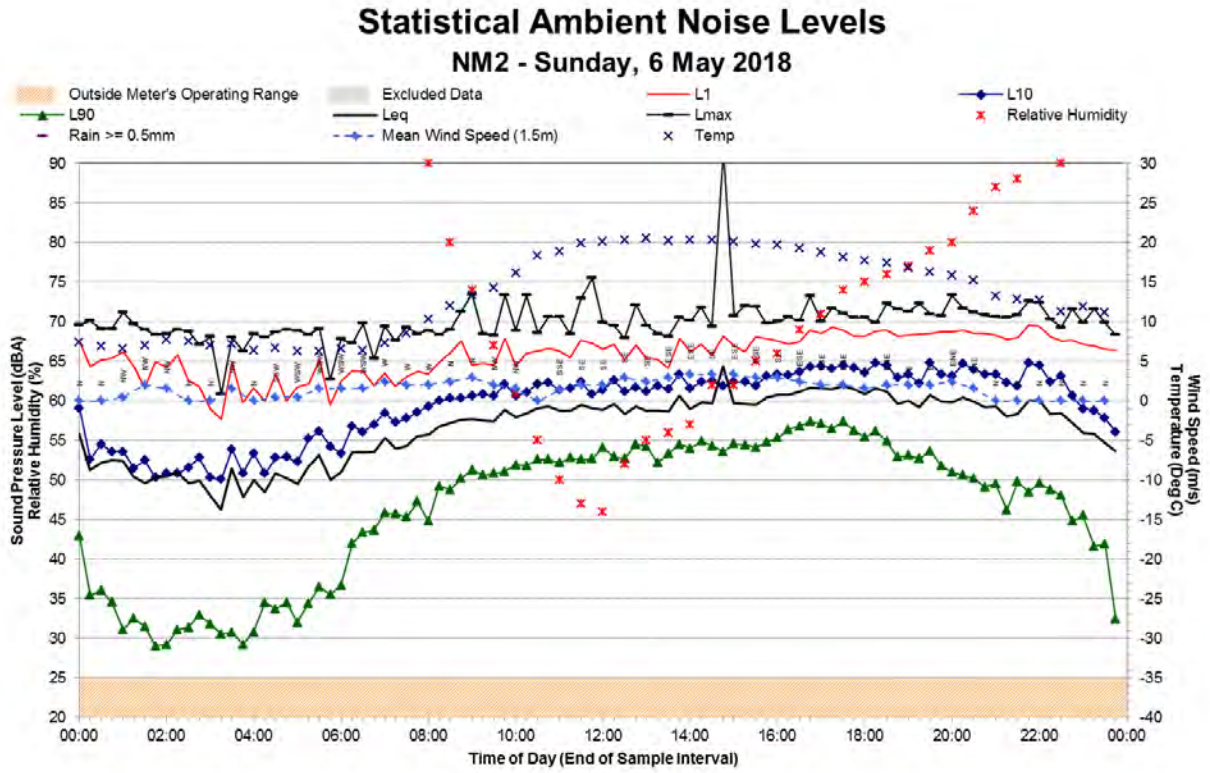


# APPENDIX C

NM2 – Ambient Noise Monitoring Results

NM2 Continuous Statistical Ambient Noise Monitoring Results



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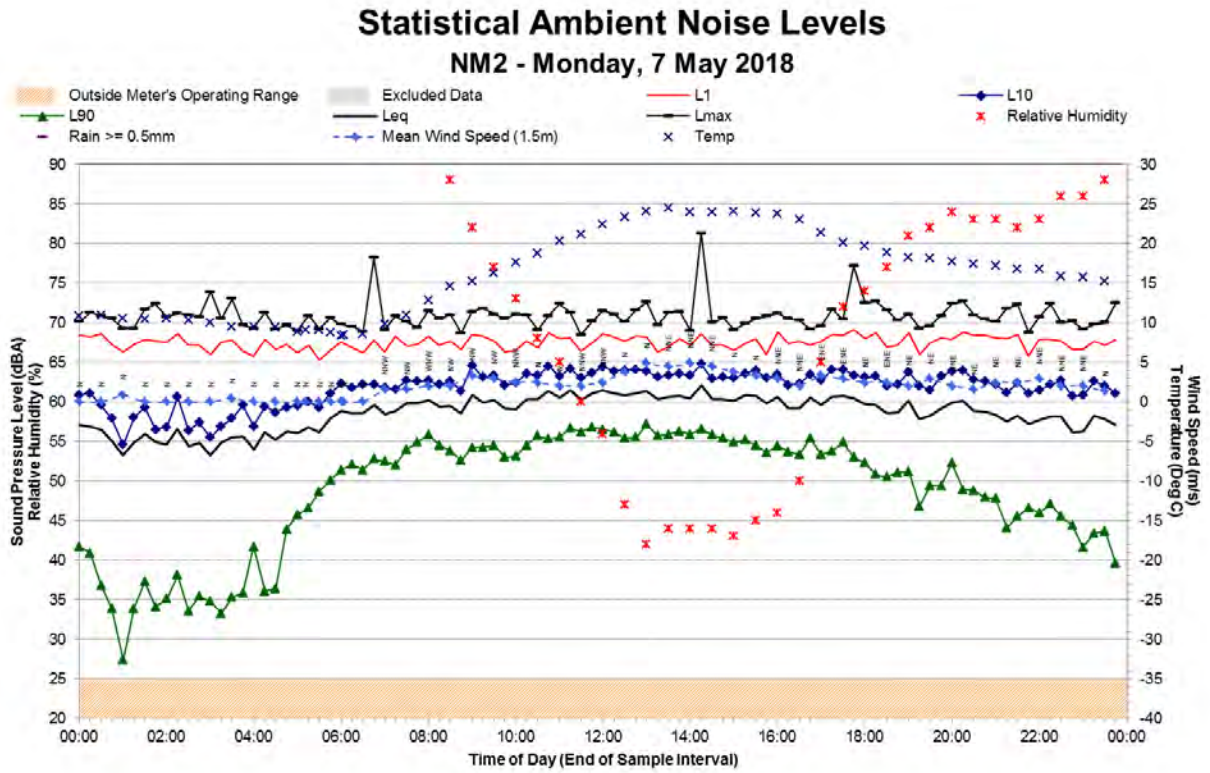
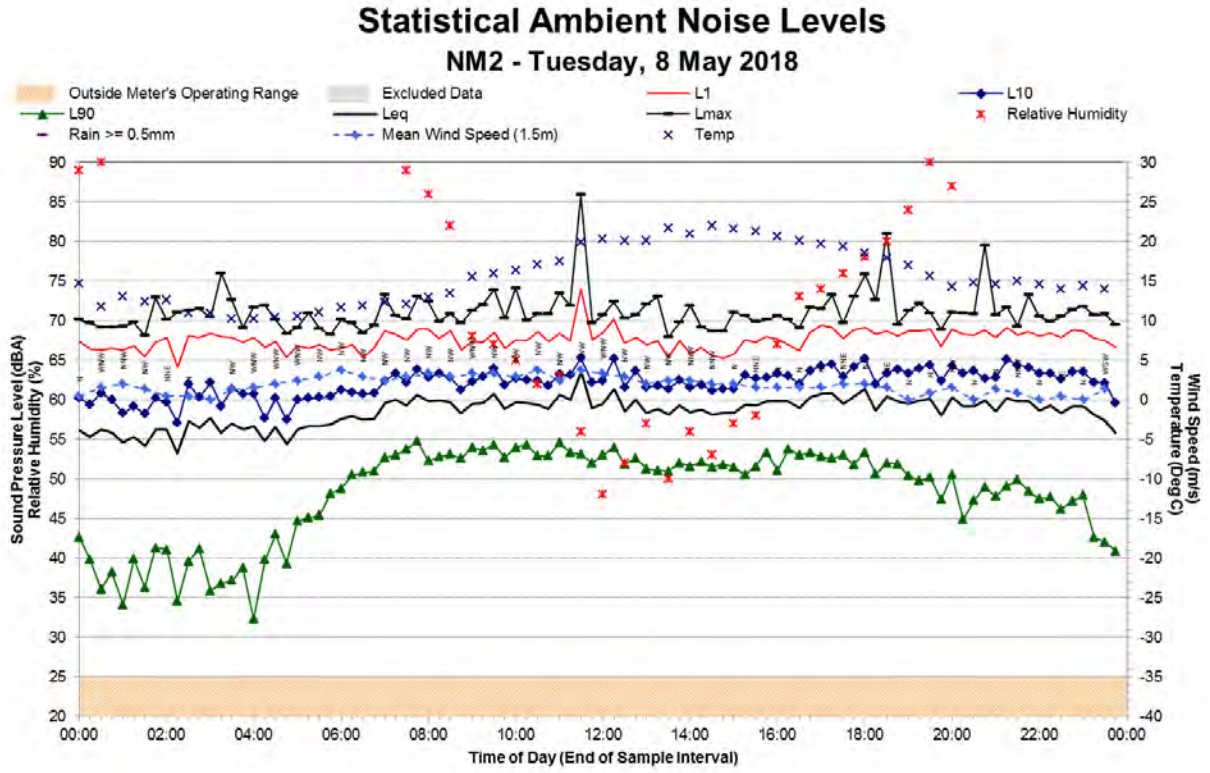
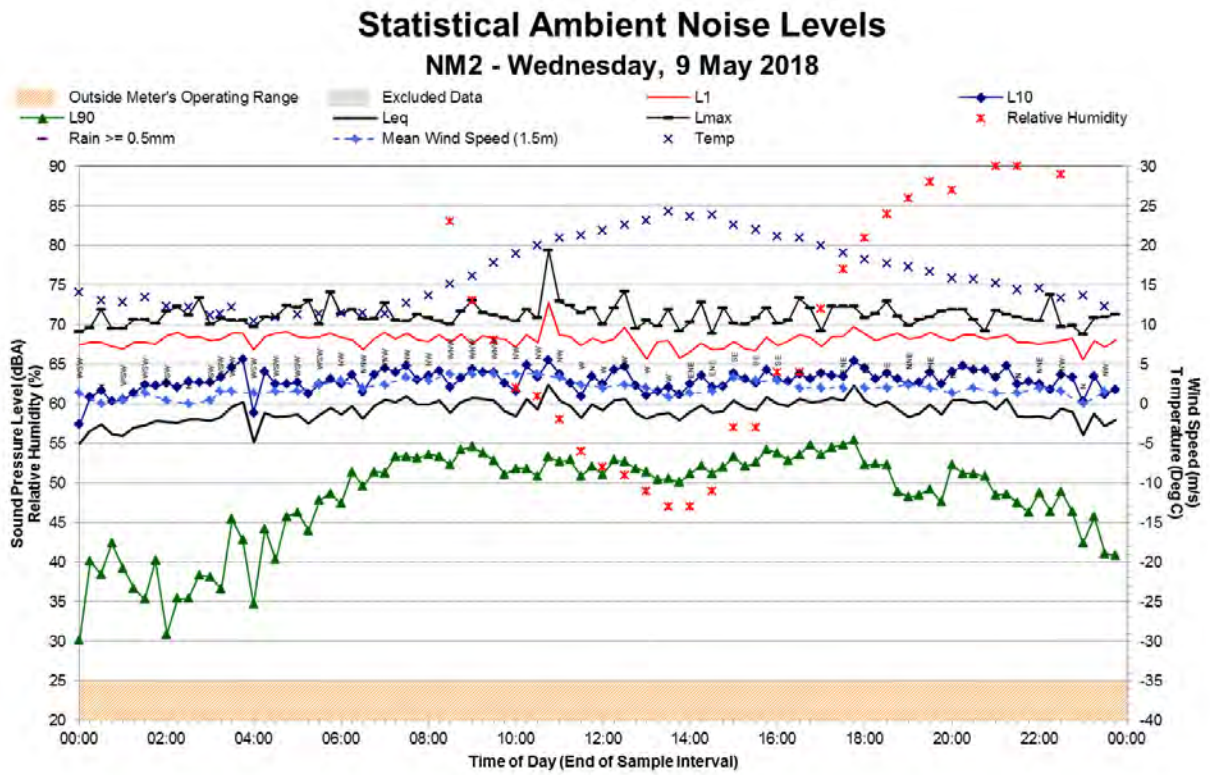
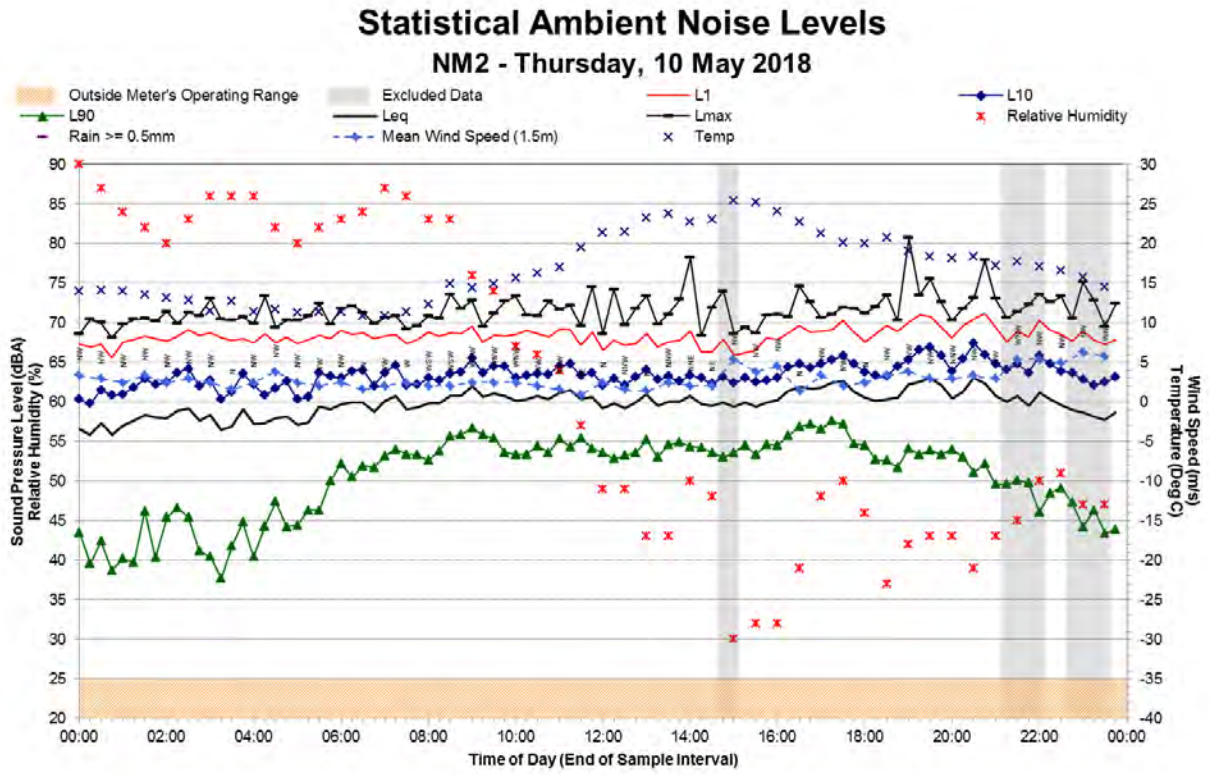


NM2 Continuous Statistical Ambient Noise Monitoring Results



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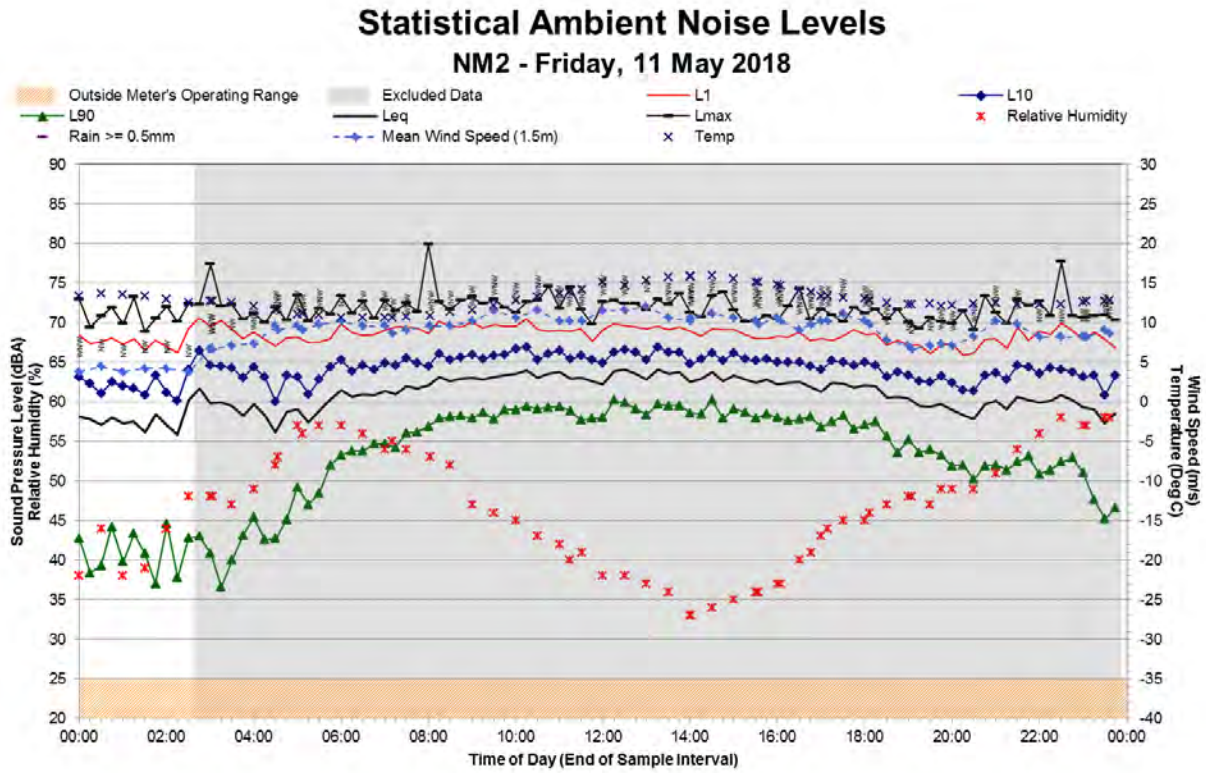
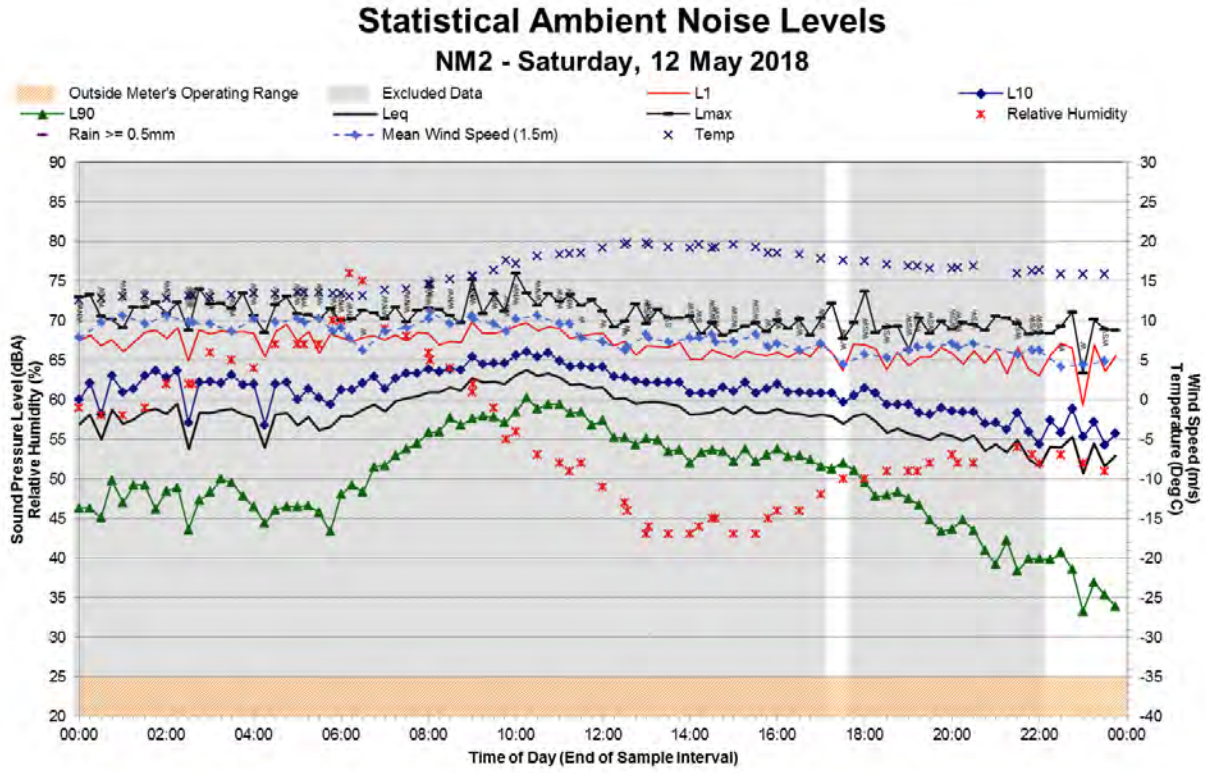
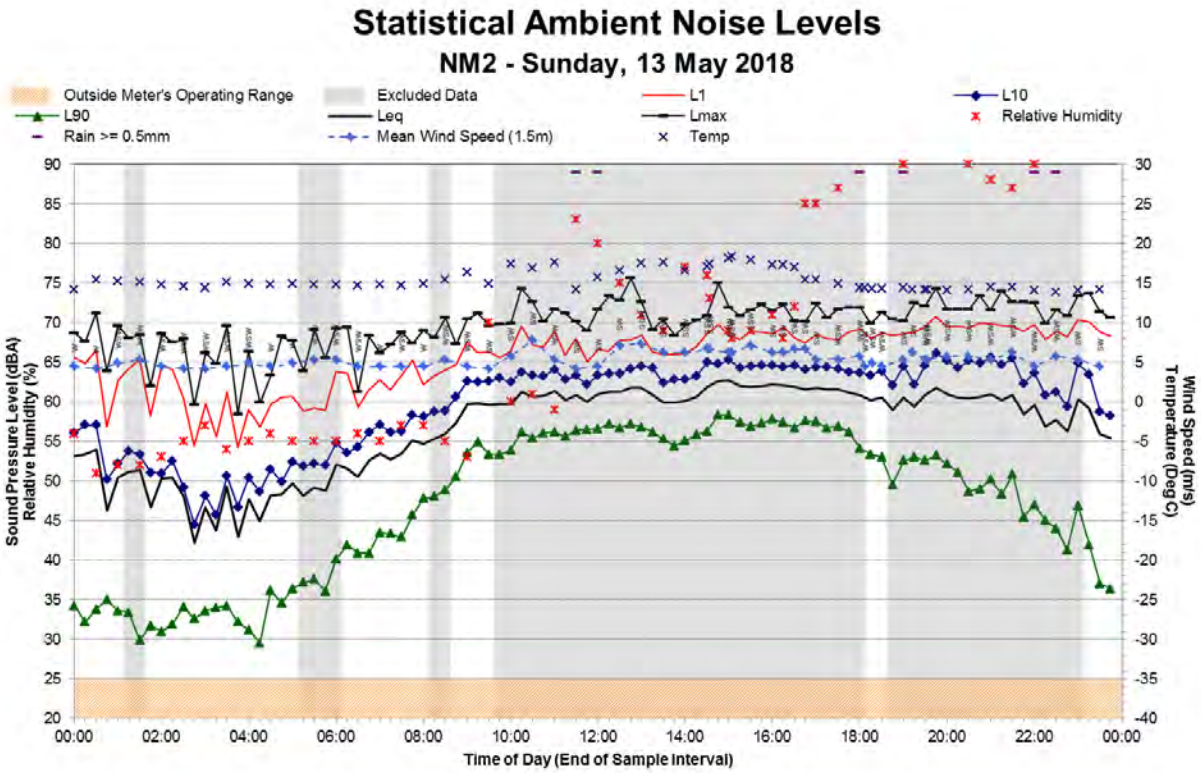
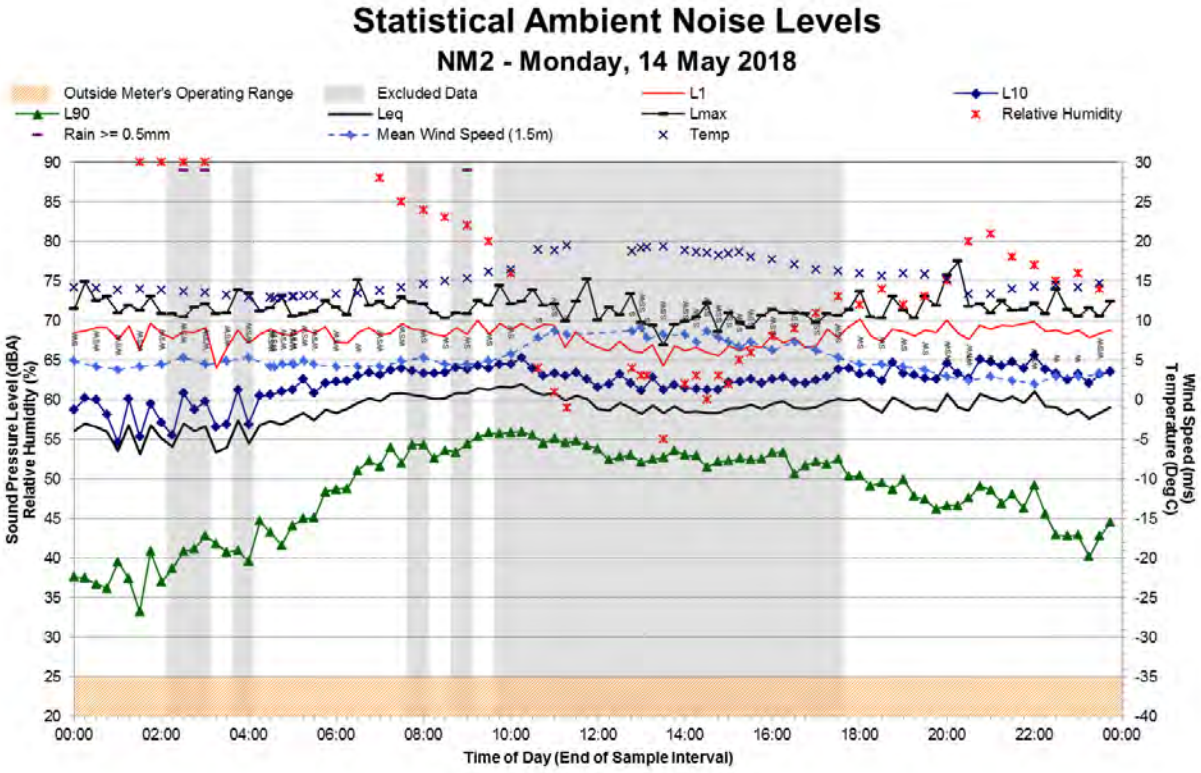
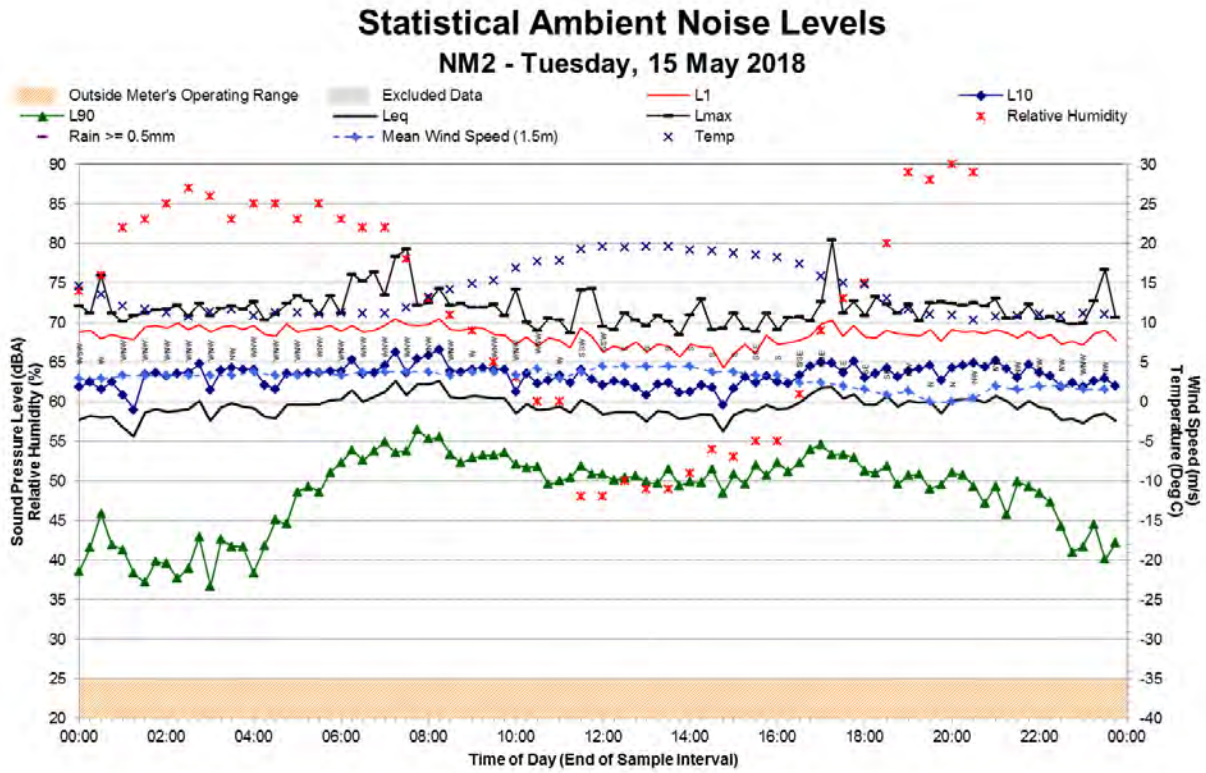


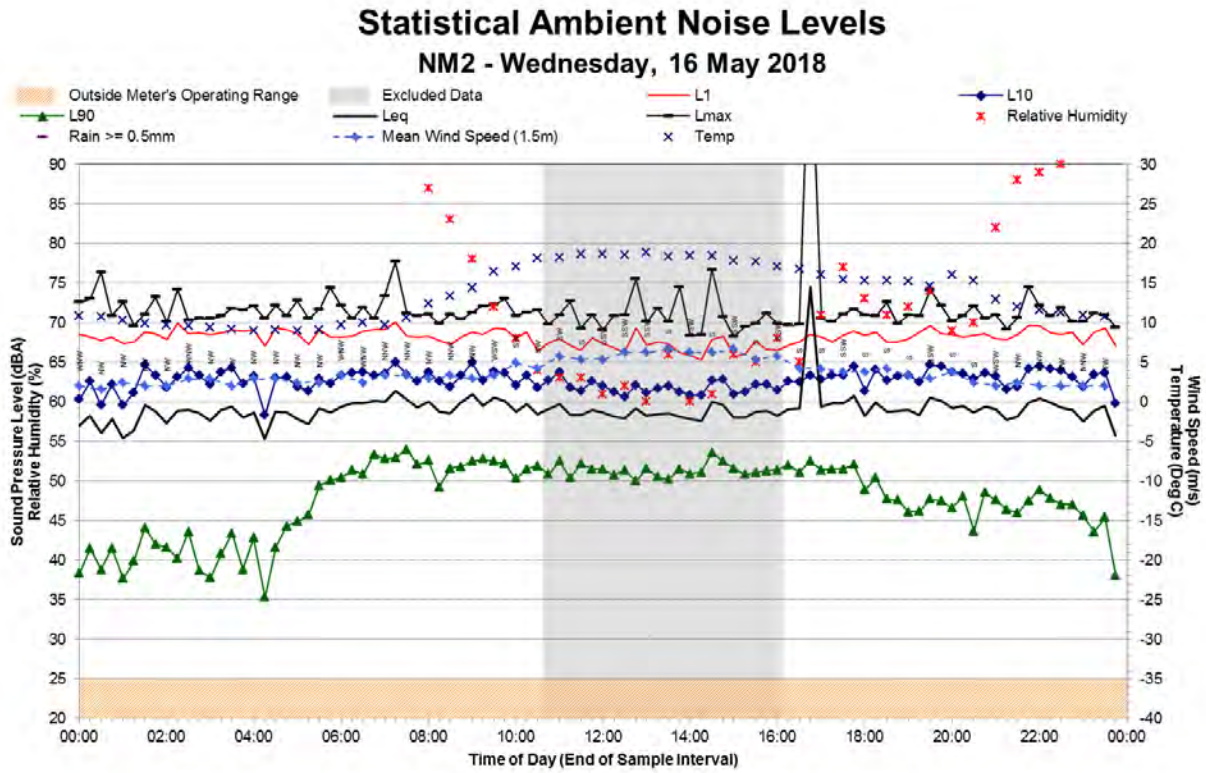




Statistical Ambient Noise Levels
NM2 - Sunday, 13 May 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Lmax
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
NM2 - Monday, 14 May 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Lmax
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)

NM2 Continuous Statistical Ambient Noise Monitoring Results



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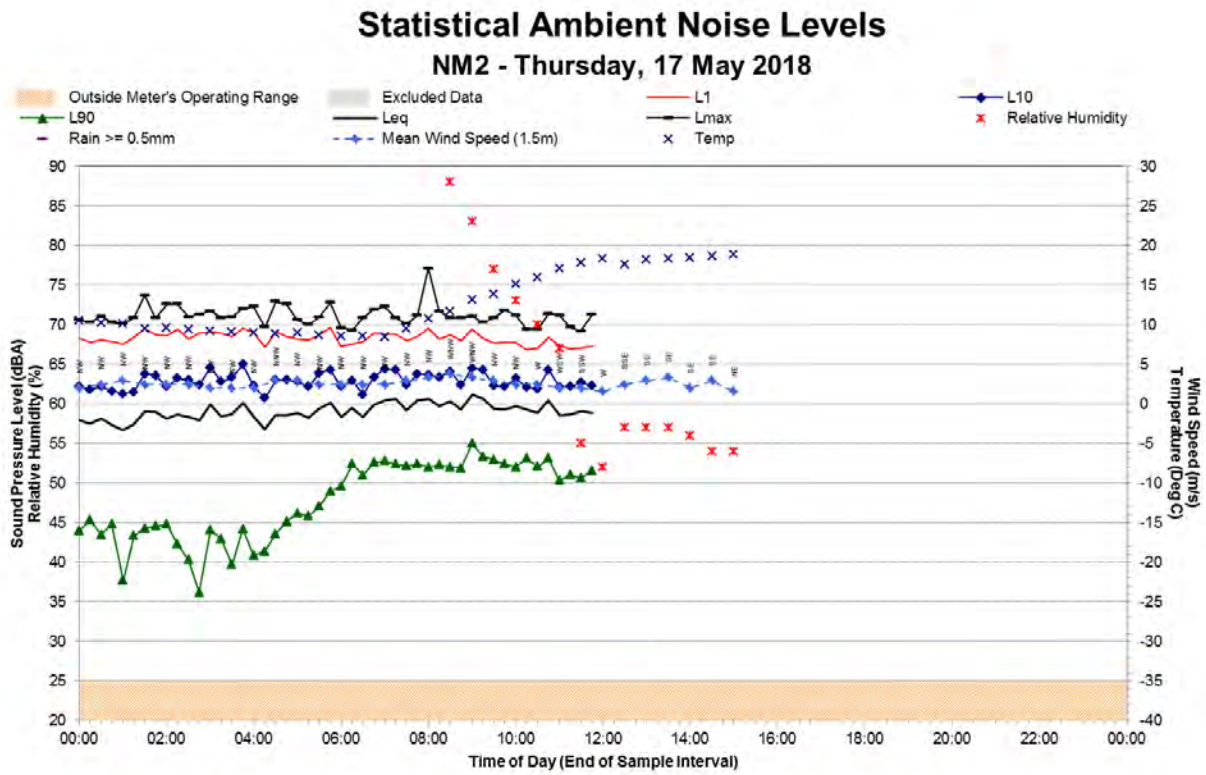
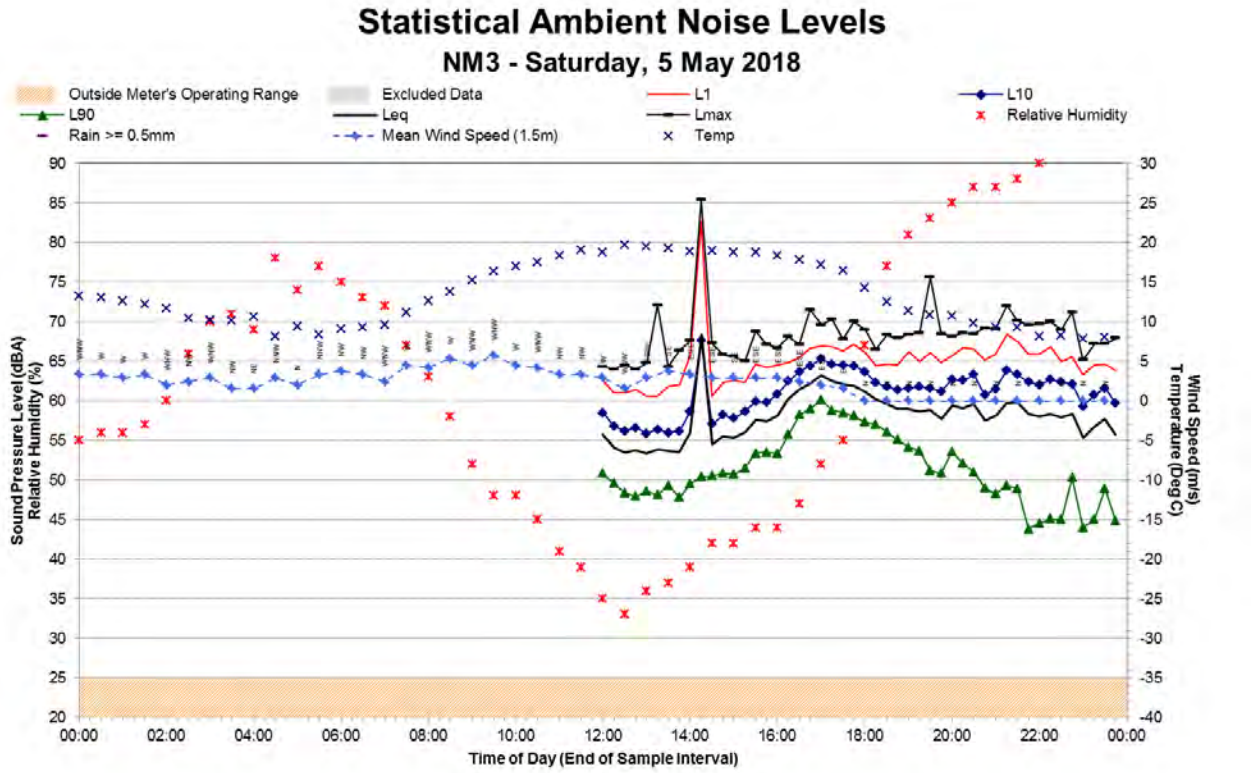
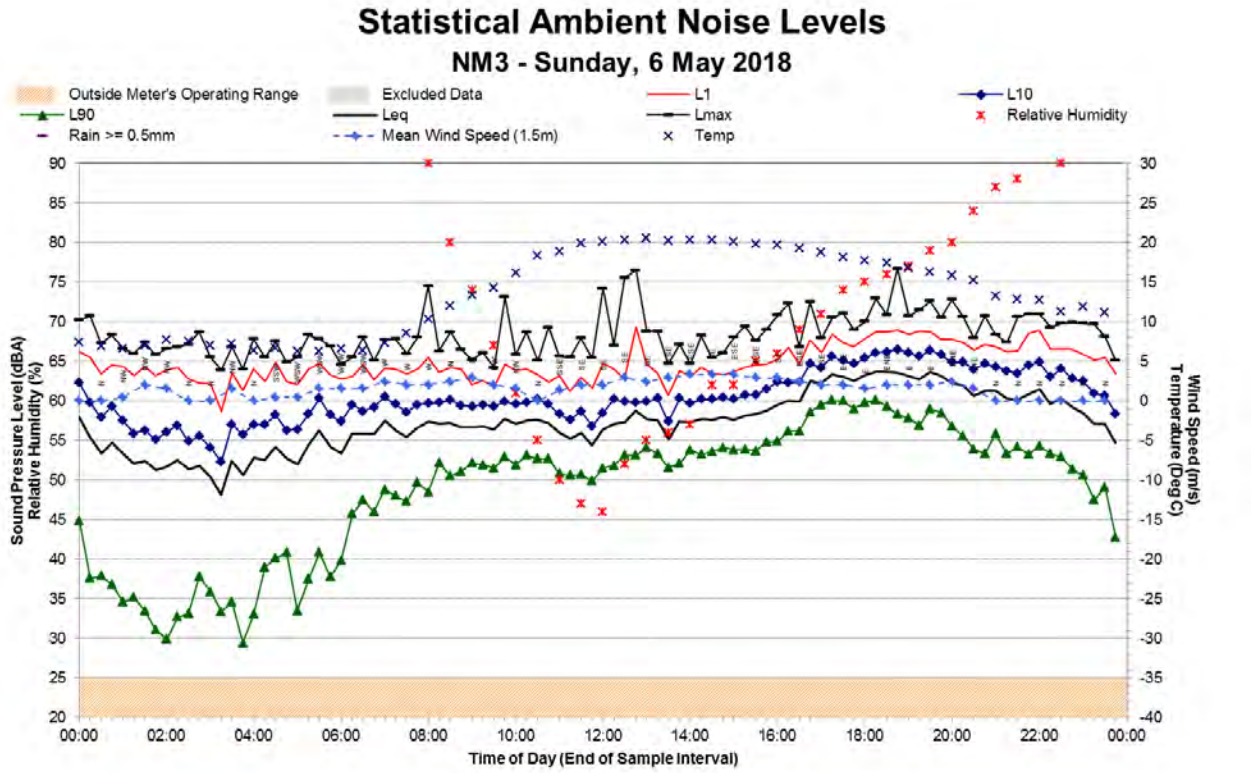


# APPENDIX D

NM3 – Ambient Noise Monitoring Results

NM3 Continuous Statistical Ambient Noise Monitoring Results



NM3 Continuous Statistical Ambient Noise Monitoring Results

## Statistical Ambient Noise Levels

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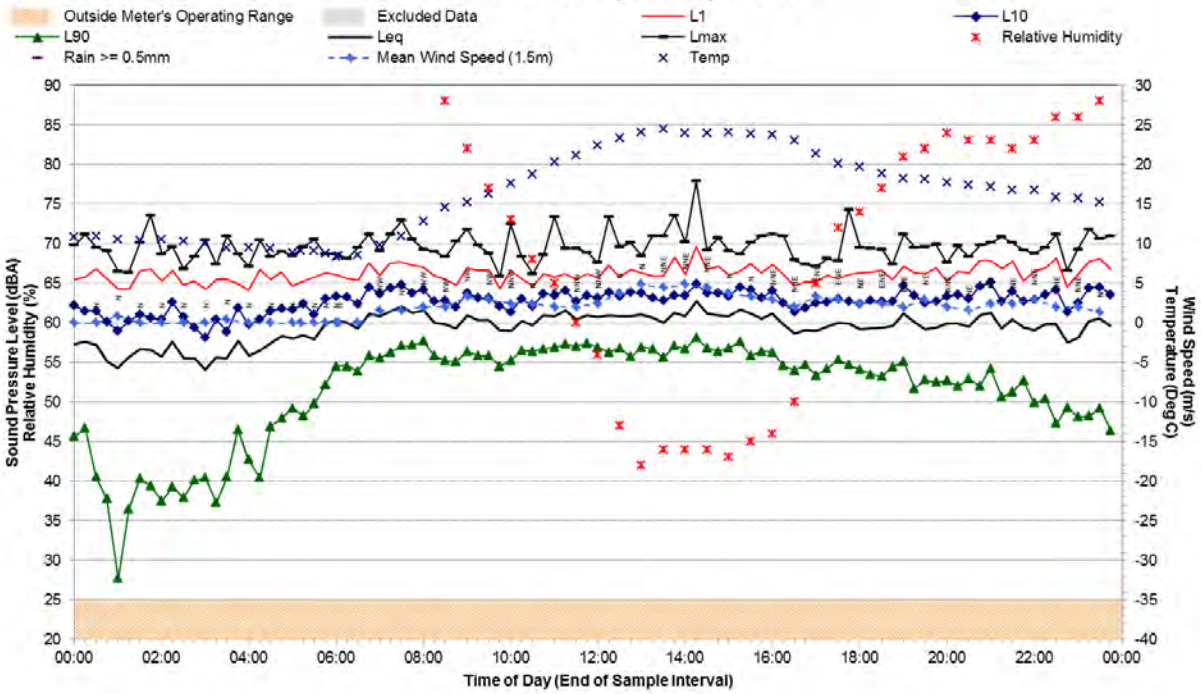


## Statistical Ambient Noise Levels

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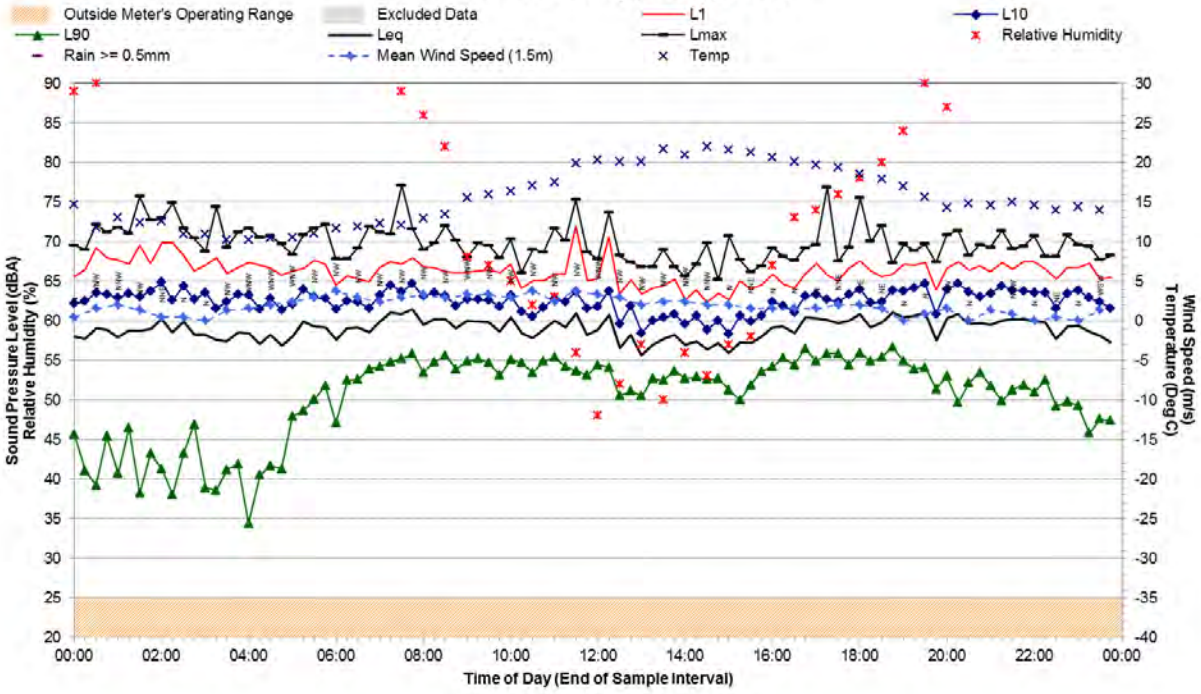
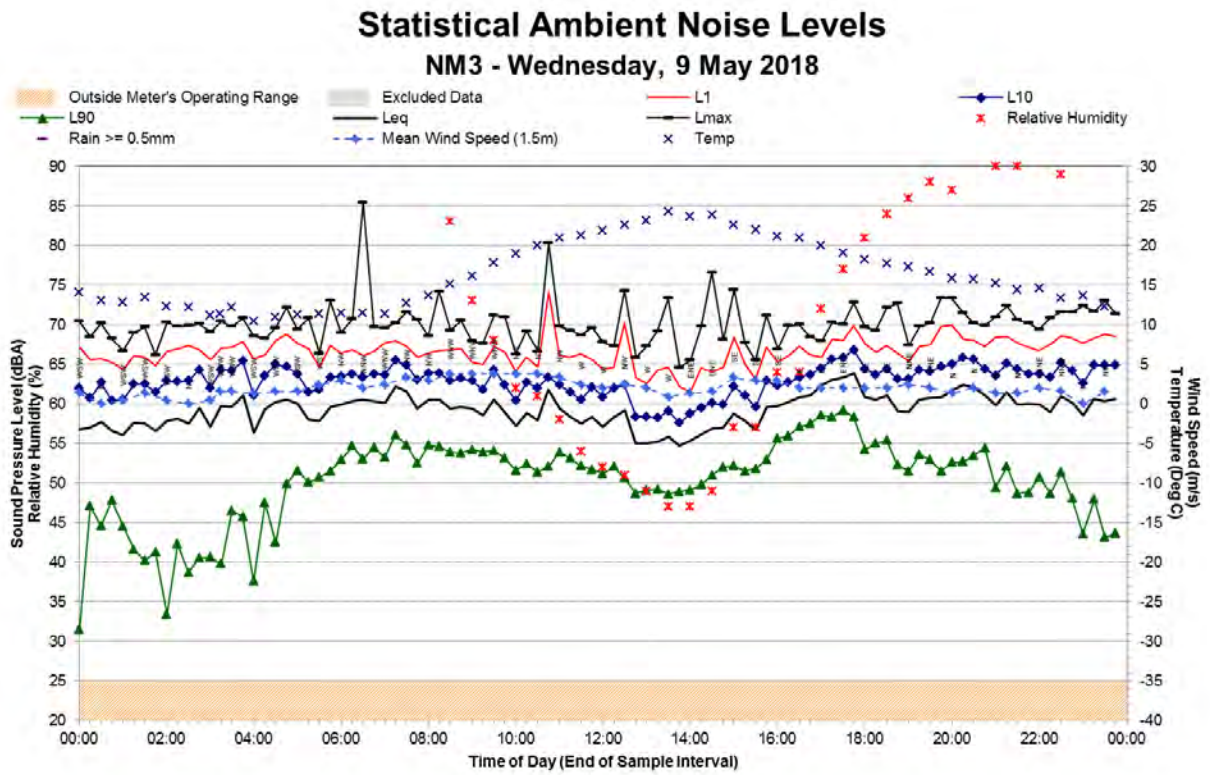
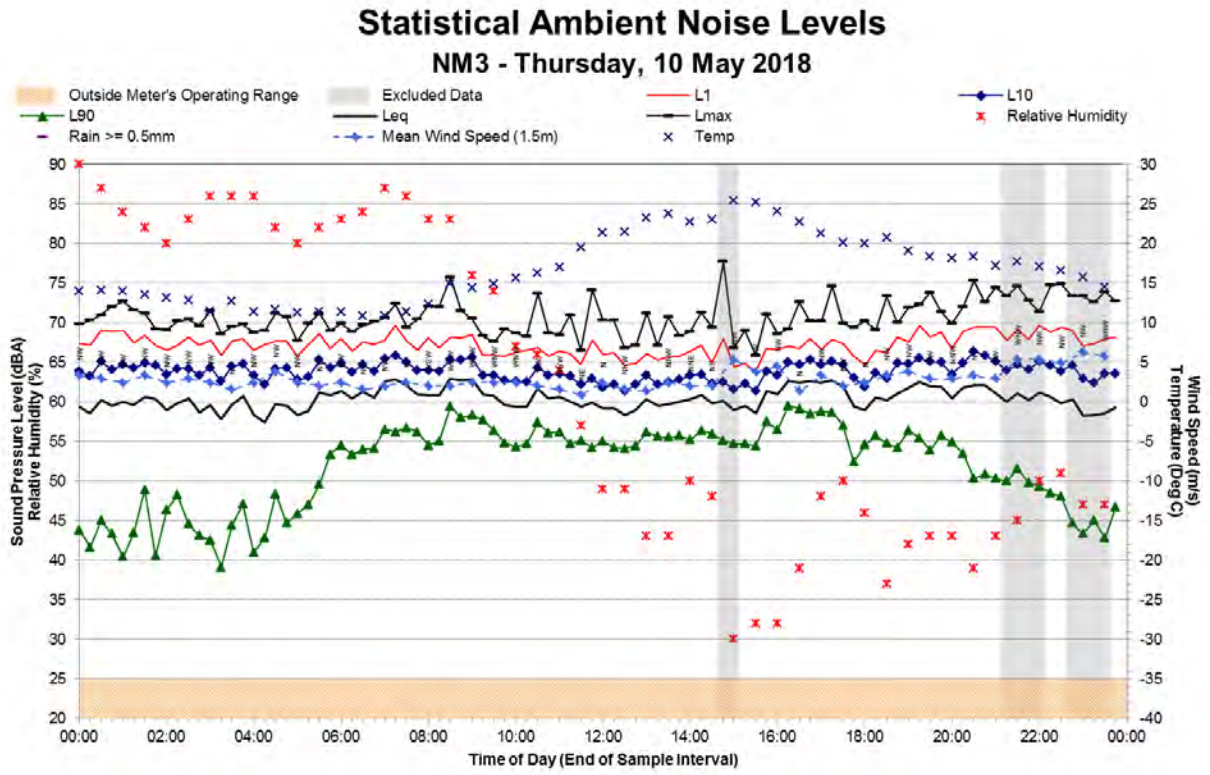
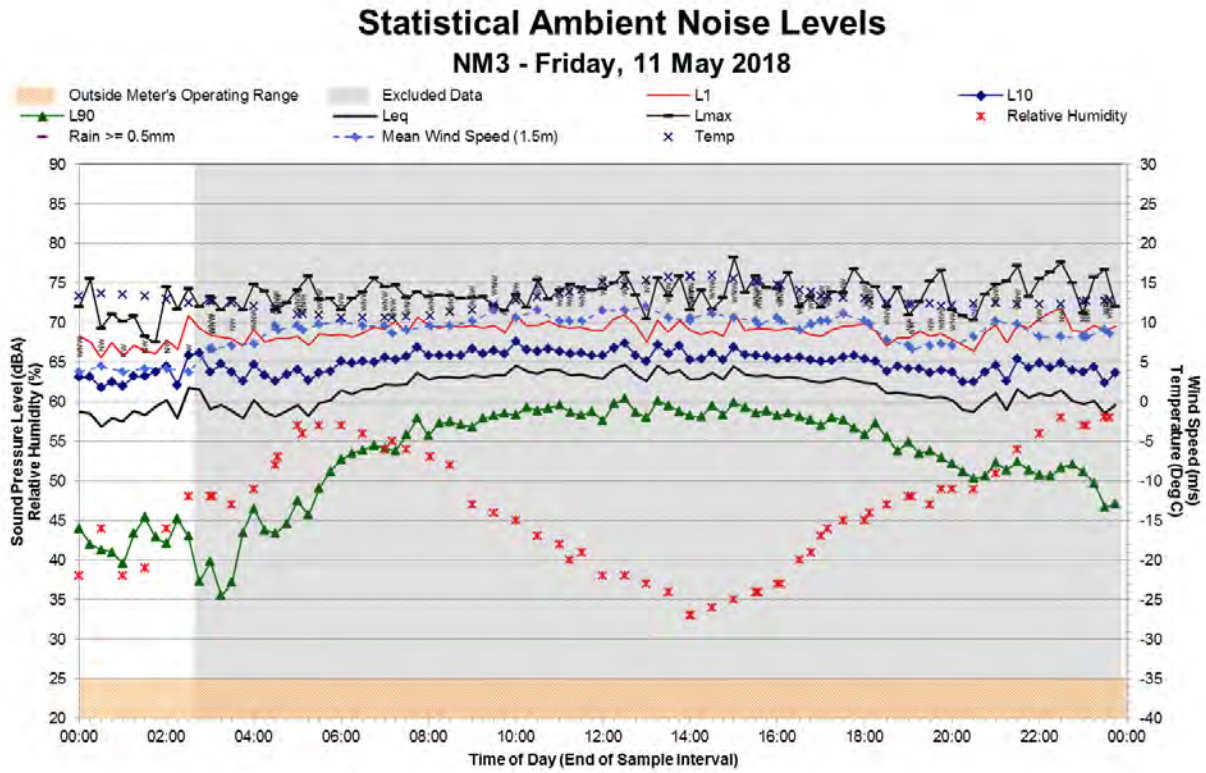
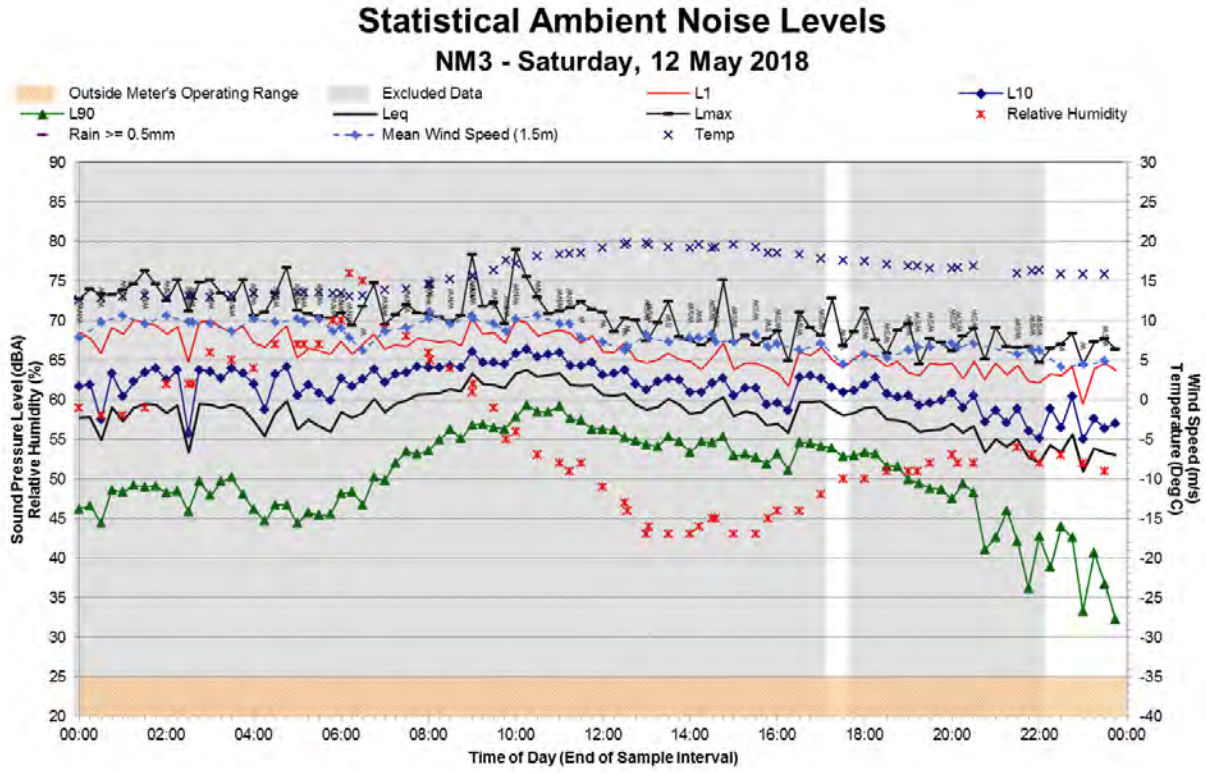


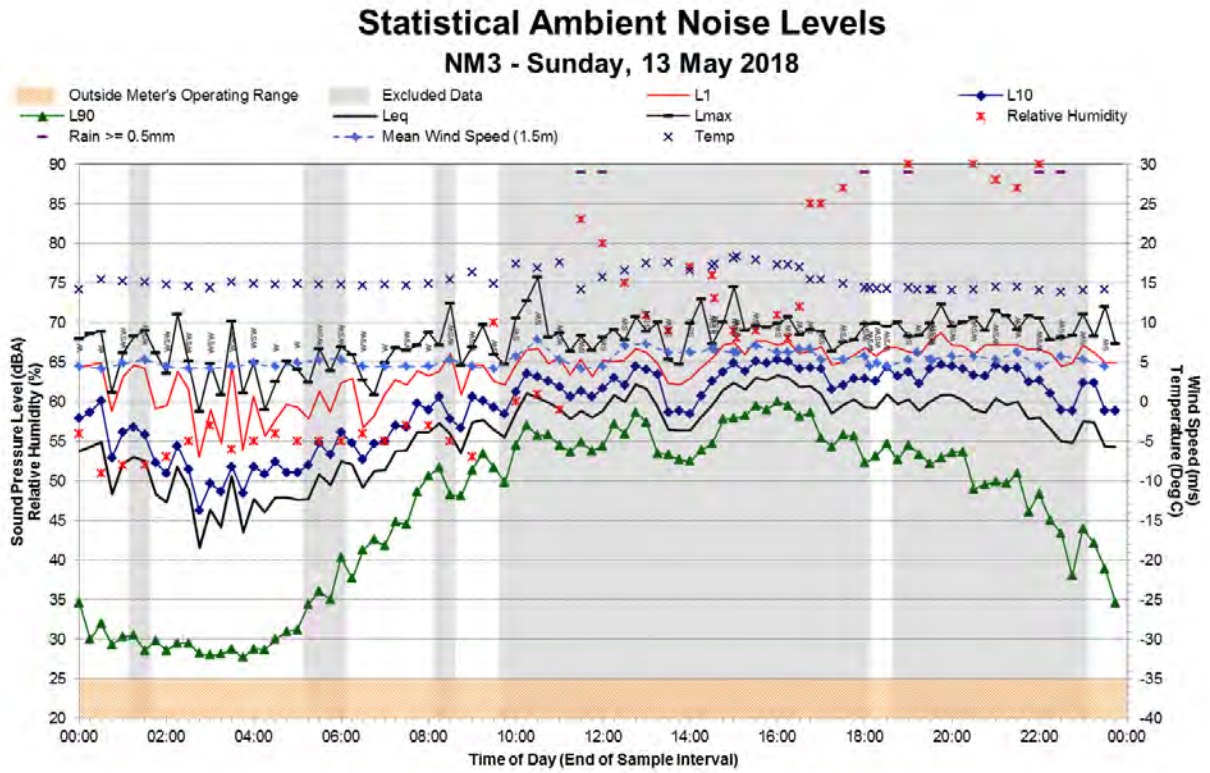
NM3 Continuous Statistical Ambient Noise Monitoring Results

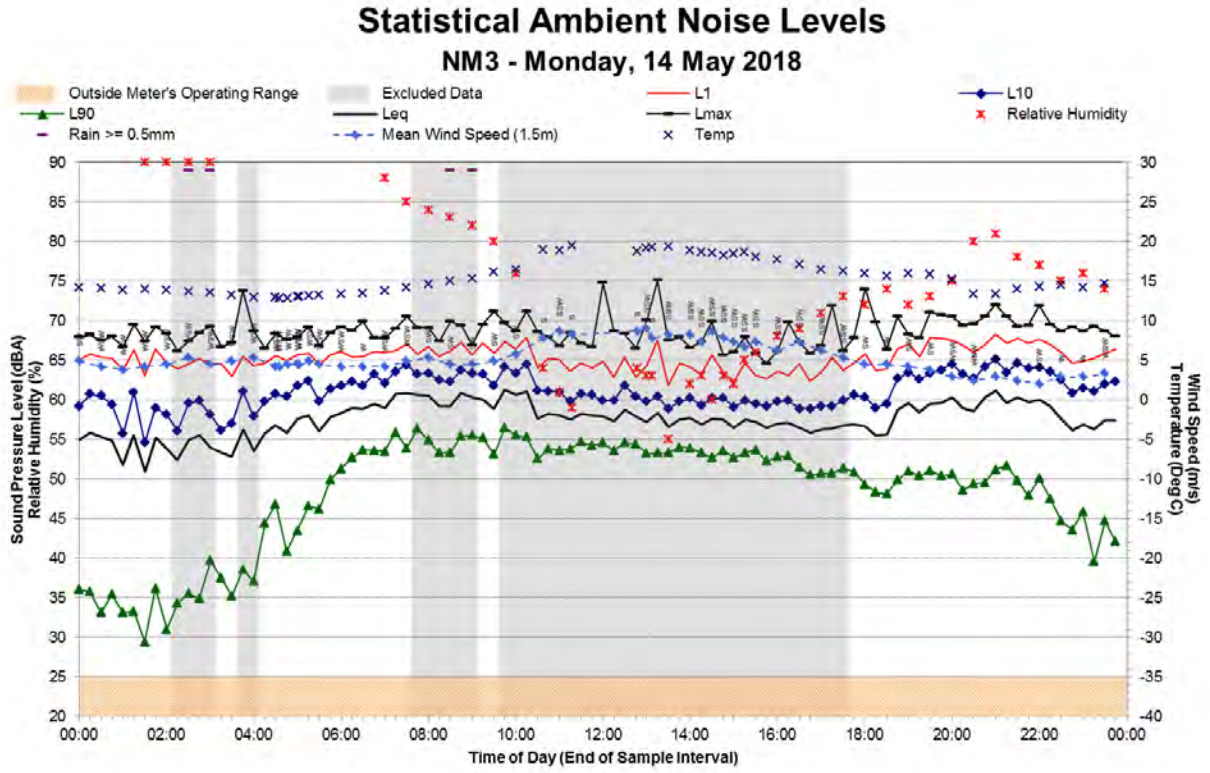


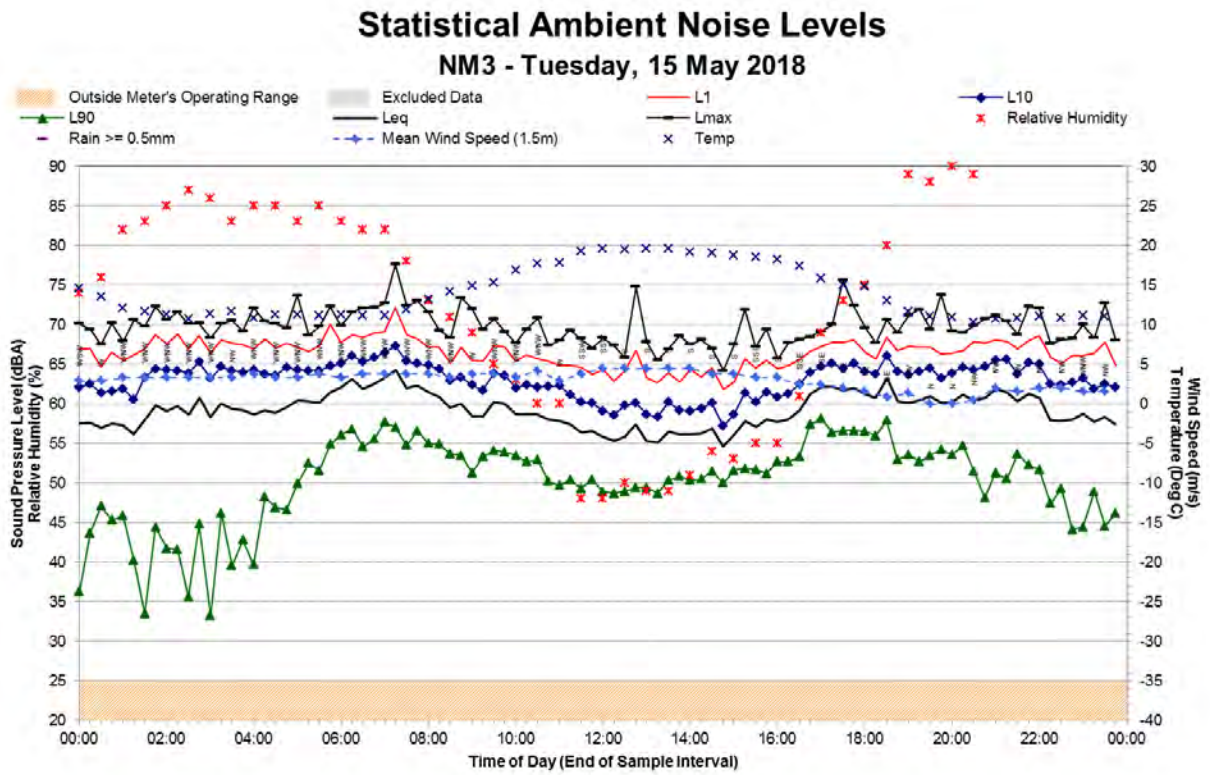



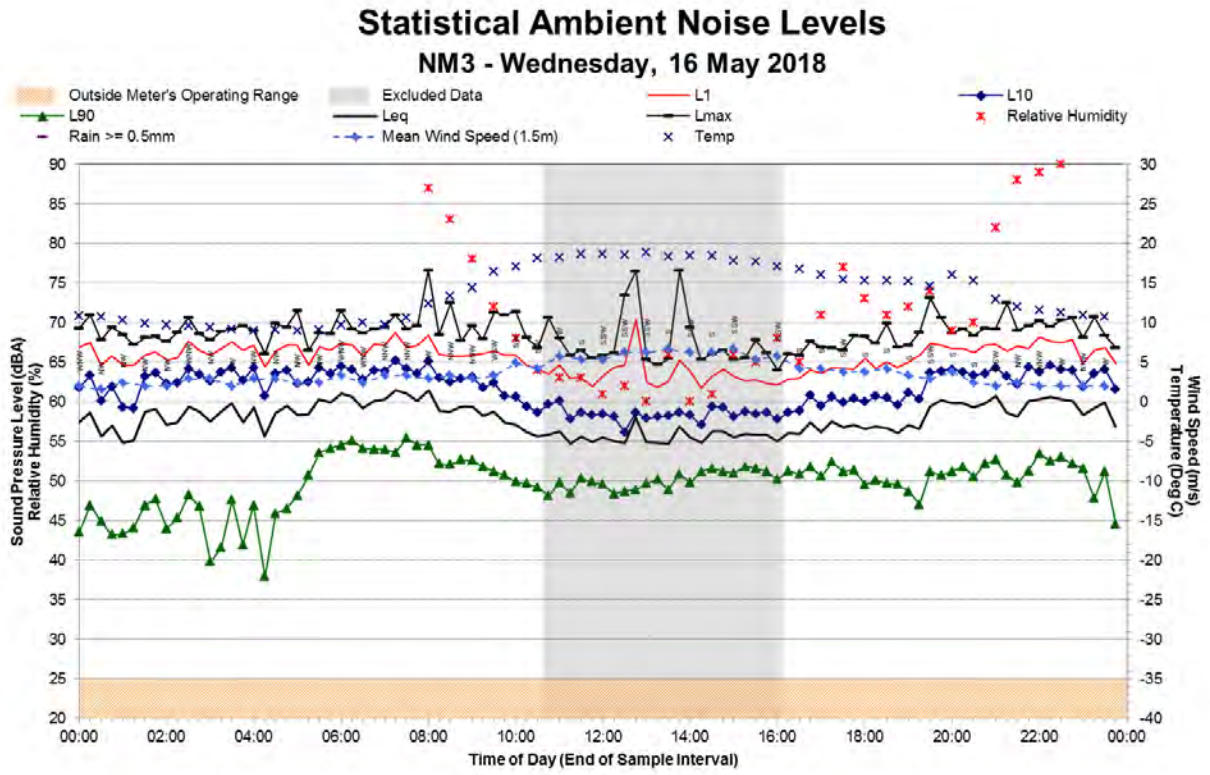

Statistical Ambient Noise Levels
NM3 - Friday, 11 May 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Lmax
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
NM3 - Saturday, 12 May 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Lmax
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)

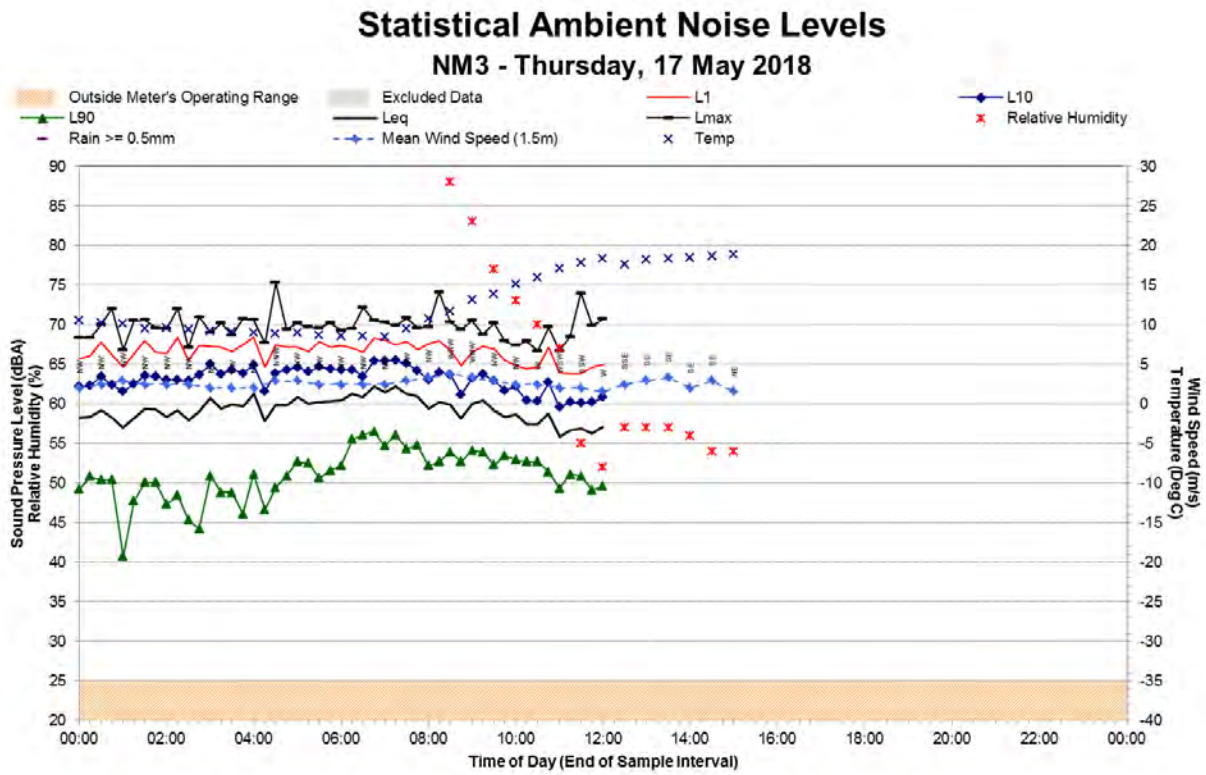

Statistical Ambient Noise Levels
NM3 - Sunday, 13 May 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Lmax
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
NM3 - Monday, 14 May 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Lmax
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
NM3 - Tuesday, 15 May 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Lmax
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
NM3 - Wednesday, 16 May 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Lmax
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)

NM3 Continuous Statistical Ambient Noise Monitoring Results



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# KARUAH QUARRY

## Biannual Noise Monitoring Assessment
## November 2018

**Prepared for:**

Hunter Quarries Pty Ltd
PO Box 3284
Thornton NSW 2322

**SLR Ref: 630.01541-R25**
**Version No: -v1.0**
**March 2019**

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# BASIS OF REPORT

This report has been prepared by SLR Consulting Australia Pty Ltd with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Hunter Quarries Pty Ltd (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

# DOCUMENT CONTROL

| Reference | Date | Prepared | Checked | Authorised |
|---|---|---|---|---|
| 630.01541-R25-v1.0 | 4 March 2019 | Jordan Murray | Robert Hall | Robert Hall |
| | | | | |
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| | | | | |
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## FIGURES



## APPENDICES

# 1 Introduction

## 1.1 Background

Hunter Quarries Pty Ltd (Hunter Quarries) has operated a hard rock quarry located approximately four (4) kilometres north of Karuah since 1997. In October 2004, Hunter Quarries applied to the Department of Planning and Infrastructure (DP&I) for approval to expand the quarry. The Minister for Planning granted development consent on 3 June 2005 (DA 265-10-2004).

Hunter Quarries has commissioned SLR Consulting Australia Pty Ltd (SLR) to prepare and implement a noise monitoring program for the Karuah Quarry in accordance with the conditions of consent specified by DP&I.

## 1.2 Objectives of this Report

The noise monitoring program requires biannual noise monitoring surveys. This report presents the results of the noise monitoring survey for the period up to November 2018.

The objectives of the noise monitoring survey for this operating period were as follows:

- Measure the ambient noise levels at four (4) key focus receptor locations surrounding the quarry.
- Qualify discernible sources of noise within each of the attended surveys, including estimated contribution or maximum level of individual noise sources.

Assess the noise emissions of Karuah Quarry with respect to the limits contained in the Development Consent.

## 1.3 Acoustic Terminology

The following report uses specialist acoustic terminology. An explanation of common terms is provided in **Appendix A.**

# 2 Karuah Quarry Development Consent Conditions

Development Consent Section 5.4.1, Schedule 4, Condition 3 provides the following:

*Within 6 months of the date of this consent, the Applicant shall prepare and implement a Noise Monitoring Program, for the development to evaluate compliance with the noise impact assessment criteria in this consent, in consultation with the DEC, and to the satisfaction of the Director-General.*

Condition 1 of the Development Consent requires Hunter Quarries to ensure noise generated by the development does not exceed criteria outlined in **Table 1** at any residence, or any noise sensitive receptor on privately owned land.

**Table 1 Development Consent Noise Impact Criteria – Karuah Quarry**

| Time Period | Noise Limit (dBA) - $L_{Aeq(15minute)}$ |
|---|---|
| Day<br>7:00am to 6:00pm Monday to Friday<br>7:00am to 1:00pm Saturday | 48 |
| Evening<br>6:00pm to 10:00pm Monday to Friday | 47 |
| At All Other Times | 46 |

# 3 Equipment Operation

Hours of operation of the Karuah Quarry are from 7:00 am to 5:00 pm Monday to Friday and 7:00 am to 12:00 pm Saturday.

Equipment operating hours for Karuah Quarry during the noise monitoring period are presented in **Table 2**.

**Table 2 Karuah Quarry Equipment Operation**

| Equipment Description | Weekday Operation, Monday – Friday (7:00 am – 5:00 pm) | Weekend Operation, Saturday (7:00 am – 12:00 pm) |
|---|---|---|
| Front End loader – Komatsu WA 470 | ✓ | ✓ |
| Front End loader – CAT 980G | ✓ | ✓ |
| Excavator | ✓ | ✓ |
| Jaw Crusher | ✓ | ✓ |
| Primary Screen | ✓ | ✓ |
| Secondary Crusher/Screen | ✓ | ✓ |
| Dump Trucks | ✓ | ✓ |

# 4 Noise Monitoring Methodology

## 4.1 General Requirements

The operational noise monitoring programme was conducted with reference to Development Consent DA 265-10-2004, AS 1055-1997 "*Acoustics - Description and Measurement of Environmental Noise*" and the NSW *Industrial Noise Policy* (INP).

All acoustic instrumentation employed throughout the monitoring programme has been designed to comply with the requirements of AS IEC 61672 (parts 1 and 2) 2004 *Electroacoustics - Sound Level Meters* and carries current NATA or manufacturer calibration certificates. Instrument calibration was checked before and after each measurement survey, with the variation in calibrated levels not exceeding ±0.5 dBA.

## 4.2 Monitoring Locations

The Karuah Quarry is located just north of Karuah adjacent to the Pacific Highway. The Pacific Highway is situated between residences and Karuah Quarry.

Operator-attended and unattended continuous noise monitoring was conducted at the three (3) nearest residences to the Karuah Quarry as presented in **Table 3** and shown in **Figure 1**.

### Table 3 Residential Monitoring Locations

| Noise Monitoring Location | Property Name | Distance from Karuah Quarry |
|---|---|---|
| NM1 | Lot 3 DP785172<br>5772 Pacific Hwy, Karuah | 317 metres South of the Karuah Quarry |
| NM2 | Lot 2 DP 785172<br>5760 Pacific Hwy, Karuah | 200 metres South of the Karuah Quarry |
| NM3 | Lot 22 DP 1024341 | 370 metres South-West of the Karuah Quarry |

Due to road traffic noise from the Pacific Highway dominating the ambient noise levels at the monitoring locations contained in **Table 3**, an additional operator-attended survey was conducted closer to the Project site. The purpose of this additional noise survey was to calculate Project noise levels back to the receivers and determine compliance with the relevant criteria. Details of the supplementary monitoring location are contained in **Table 4**.

### Table 4 Supplementary Monitoring Location

| Survey Location | Coordinates (UTM) | |
|---|---|---|
| | Easting (m) | Northing (m) |
| Project Site – weighbridge | 406045 | 6389153 |

### 4.2.1 Additional Noise Monitoring Location

Noise monitoring was also undertaken at 1714 Branch Lane, Karuah (Location F) in response to the following comment from the NSW Department of Planning and Environment (DP&E) on the 2015 Annual Review:

> *Further, please undertake noise monitoring to confirm compliance with Condition 1, Schedule 3, which requires that the noise generated by the development does not exceed criteria at any residence on privately owned land, including the residence at 1714 Branch Lane, Karuah.*

Noise monitoring Location F is shown in **Figure 2**.

## Figure 1 Noise Monitoring Locations

**Figure 2 Location F Noise Monitoring Location**


## 4.3 Operator-attended Noise Surveys

An operator-attended noise survey was conducted at each of the four (4) monitoring locations (refer to **Figure 1** and **Figure 2**) on Thursday 22 November 2018. The purpose of the noise surveys was to verify the unattended logging results and to determine the character and contribution of noise sources to the total ambient noise level.

All acoustic instrumentation employed throughout the monitoring programme has been designed to comply with the requirements of AS IEC 61672.1 – 2004 *Electroacoustics—Sound level meters – Specifications*, AS IEC 61672.2-2004, AS IEC 61672.3-2004 and carried current NATA or manufacturer calibration certificates. Instrument calibration was checked before and after each measurement survey, with the variation in calibrated levels not exceeding ±0.5 dBA.

The instrument used for the operator attended surveys was a B&K Type 2250 (serial number: 3011822).

## 4.4 Unattended Continuous Monitoring

Environmental noise loggers were deployed at monitoring location NM1, NM2, and NM3 (refer to **Figure 1** and **Figure 2).** For each location, noise monitoring was undertaken from Thursday 15 November 2018 to Thursday 22 November 2018 inclusive. Details of the noise loggers used for unattended continuous noise monitoring are given in **Table 5**.

The environmental noise loggers were programmed to record statistical noise level indices continuously in 15 minute intervals.

**Table 5 Noise Logger and Noise Monitoring Location**

| Location | Noise Logger Serial Number | Date of Logging |
|---|---|---|
| NM1 | 23815 | 15/11/2018 – 22/11/2018 |
| NM2 | 20665 | 15/11/2018 – 22/11/2018 |
| NM3 | 16-203-525 | 15/11/2018 – 22/11/2018 |

# 5 Operator Attended Noise Monitoring

## 5.1 Results of Operator-attended Noise Monitoring

The results of operator-attended noise monitoring are presented in **Table 6**.

Ambient noise levels given in the tables include all noise sources such as traffic, insects, birds, construction activities and quarry operations. The table provides the following information:

- Monitoring location
- Date, start time, Wind velocity (m/s) and Temperature (ºC) at the measurement location; and
- Typical maximum ($L_{Amax}$) and contributed noise levels.

Quarry contributions listed in the tables are from Karuah Quarry and are stated only when a contribution could be quantified.

**Table 6 Operator Attended Noise Survey Results**

| Location | Date/ Start time/ Period/ Weather | Primary Noise Descriptor (dBA re 20 µPa) | | | | | Description of Noise Emission, Typical Maximum Levels $L_{Amax}$ |
|---|---|---|---|---|---|---|---|
| | | $L_{Amax}$ | $L_{A1}$ | $L_{A10}$ | $L_{A90}$ | $L_{Aeq}$ | |
| NM1 | 22/11/2018<br>7:00<br>Day<br>1 m/s SSE<br>18°C | 77 | 76 | 70 | 56 | 67 | Pacific Highway traffic 50 – 77<br>Insects 50 – 53<br>Birds 45 – 55<br>**Karuah Quarry Inaudible** |
| NM2 | 22/11/2018<br>7:23<br>Day<br>1 m/s SE<br>18°C | 72 | 69 | 56 | 53 | 61 | Pacific Highway traffic 53 – 72<br>Insects 50 – 52<br>Birds 58 – 62<br>**Karuah Quarry Inaudible** |
| NM3 | 22/11/2018<br>07:52<br>Day<br>1. m/s SSW<br>21°C | 67 | 66 | 63 | 53 | 59 | Pacific Highway traffic 55 – 67<br>Insects 53<br>Birds 56 – 65<br>**Karuah Quarry Inaudible** |

| Location | Date/ Start time/ Period/ | Primary Noise Descriptor (dBA re 20 μPa) | | | | | Description of Noise Emission, Typical Maximum |
|---|---|---|---|---|---|---|---|
| F | 22/11/2018<br>08:59<br>Day<br>2 m/s SSW<br>25°C | 84 | 69 | 47 | 40 | 57 | Pacific Highway traffic 38 – 40<br>Local traffic 63 – 84<br>Birds 40 – 44<br>**Karuah Quarry Inaudible** |
| Project Site - weighbridge | 22/11/2018<br>09:32<br>Day<br>2 m/s SSE<br>25°C | 77 | 74 | 66 | 56 | 64 | Pacific Highway traffic 55 – 58<br>**Karuah Quarry Audible**<br>Crushing plant 50-52<br>Trucks at weighbridge 62 – 68<br>**Estimated $L_{Aeq(15minute)}$ Contribution 62 dBA** |

## 5.2 Operator-attended Noise Monitoring Summary

Noise generated by traffic on the Pacific Highway and insect noise dominated ambient noise levels at noise monitoring locations NM1, NM2 and NM3. Noise generated by traffic on the Pacific Highway and Branch Lane dominated ambient noise levels at noise monitoring Location F.

The quarry was inaudible and unmeasurable at NM1, NM2 and NM3 monitoring locations due to high ambient noise levels from Pacific Highway traffic.

Results of the operational compliance assessment are given in **Table 7**.

### Table 7 Compliance Noise Assessment – Operations

| Location | Estimated Karuah $L_{Aeq(15minute)}$ Contribution | Consent Conditions $L_{Aeq(15minute)}$ | Compliance |
|---|---|---|---|
| | Day | Day | Day |
| NM1 | Inaudible at all times | 48 | Yes |
| NM2 | Inaudible at all times | 48 | Yes |
| NM3 | Inaudible at all times | 48 | Yes |
| Location F | Inaudible at all times | 48 | Yes |

### 5.2.1 Predicted Noise Levels at Receiver Locations

Based on the site measurement (weighbridge location), a screening estimation of noise levels at the noise sensitive receivers (see **Table 3**) are displayed in **Table 8**. These calculations are considered conservative as they only take distance attenuation into account.

**Table 8 Predicted Noise Levels at Receiver Locations**

| Receiver | Estimated noise level at receiver ($L_{Aeq(15minute)}$) (dBA) | Criteria ($L_{Aeq(15minute)}$) (dBA) |
|---|---|---|
| NM1 | 48 | 48 |
| NM2 | 48 | 48 |
| NM3 | 47 | 48 |

As shown in **Table 8** the Project is predicted to have achieved compliance at the relevant noise sensitive receiver locations.

# 6 Unattended Continuous Noise Monitoring

## 6.1 Results of Unattended Continuous Monitoring

The unattended ambient noise logger data from monitoring location NM1, NM2 and NM3 are presented graphically on a daily basis and are attached as **Appendix B**, **Appendix C** and **Appendix D** respectively. A summary of the results of the unattended continuous noise monitoring is given in **Table 9.** The ambient noise level data quantifies the overall noise level at a given location independent of its source or character.

The measured ambient noise levels were divided into three periods representing day, evening and night as defined in the INP. The INP time classifications differ slightly from the conditions of consent in that the INP daytime includes weekends; Saturday 7:00 am to 6:00 pm as well as Sunday 8:00 am to 6:00 pm, whereas the allowable operating conditions include only Saturday 7:00 am to 1:00 pm. The evening time classifications are the same and where the conditions of consent refer to all other times, the INP nominates this as “night”.

Precautions were taken to minimise influences from extraneous noise sources (eg optimum placement of the loggers away from creeks, trees, houses, etc), however, not all these sources or their effects can be eliminated. This is particularly the case during the warmer times of year when noise from insects, frogs, birds and other animals can become quite prevalent.

Weather data was obtained from the automatic weather station located at Karuah East Quarry. Unattended noise data corresponding with periods of rainfall and/or wind speeds in excess of 5 m/s (approximately 18km/hr) were discarded in accordance with the INP data exclusion methodology.

**Table 9 Unattended Continuous Monitoring Ambient Noise Levels (dBA)**

| INP Period | $L_{A1}$ | $L_{A10}$ | $L_{A90}$ | $L_{Aeq}$ |
|---|---|---|---|---|
| **NM1** | | | | |
| Daytime during Operational Hours[1] | 73 | 69 | 57 | 66 |
| Daytime outside Operational Hours[2] | 73 | 69 | 56 | 66 |
| Evening[3] | 75 | 69 | 52 | 65 |
| Night[4] | 74 | 68 | 42 | 64 |
| **NM2** | | | | |
| Daytime during Operational Hours[1] | 67 | 63 | 52 | 60 |
| Daytime outside Operational Hours[2] | 67 | 62 | 51 | 60 |
| Evening[3] | 68 | 63 | 47 | 59 |
| Night[4] | 68 | 63 | 38 | 58 |
| **NM3** | | | | |
| Daytime during Operational Hours[1] | 67 | 64 | 52 | 61 |
| Daytime outside Operational Hours[2] | 68 | 64 | 55 | 61 |
| Evening[3] | 68 | 64 | 53 | 60 |
| Night[4] | 68 | 64 | 52 | 63 |

Note:
1. Daytime - 7.00 am to 5.00 pm Monday to Friday, 8.00 am to 12.00 pm Saturday, not operational on Sunday.
2. Daytime - 5.00 pm to 6.00 pm Monday to Friday, 12.00 pm to 6.00 pm Saturday, 8.00 am to 6.00 pm Sunday.
3. Evening - 6.00 pm 10.00 pm.
4. Night - 10.00 pm to 7.00 am pm Monday to Saturday, 10.00 pm to 8.00 am Sunday.

## 6.2 Unattended Continuous Noise Monitoring Summary

Ambient $L_{A90}$ noise levels during the daytime period at monitoring locations NM1, NM2 and NM3 outside the quarry's operational hours are consistent with those during operational hours. This indicates that the quarry is not the dominant contributor to ambient noise levels during the daytime, consistent with observations made during the operator-attended noise survey. The main contributors to ambient noise levels at all monitoring locations are considered to be traffic along the Pacific Highway and natural sources such as birds and insects.

# 7 Conclusion

SLR was engaged by Hunter Quarries to prepare and implement a noise monitoring program for the Karuah Quarry in accordance with the Conditions of Consent for the operation. This report presents the biannual noise monitoring survey results for the period up to the end of December 2018 in accordance with the noise monitoring program.

Operator-attended and unattended noise monitoring was conducted at the three (3) nearest residences to determine noise levels produced by Karuah Quarry operations. An additional operator-attended noise survey was conducted at location F as requested by NSW DP&E and at the Project site in order to determine likely compliance.

The noise contribution of Karuah Quarry operations was found to be significantly lower than that from road traffic on the Pacific Highway during all operator-attended noise surveys. The noise compliance results presented in **Table 7** and **Table 8** indicate compliance with the relevant consent conditions at all noise monitoring locations during the operator-attended survey.

Results from the unattended ambient noise measurements conducted at three (3) noise monitoring locations were also consistent with site observations which indicate that the Karuah Quarry is not a major contributor to ambient noise levels at these locations during the survey period.

# APPENDIX A

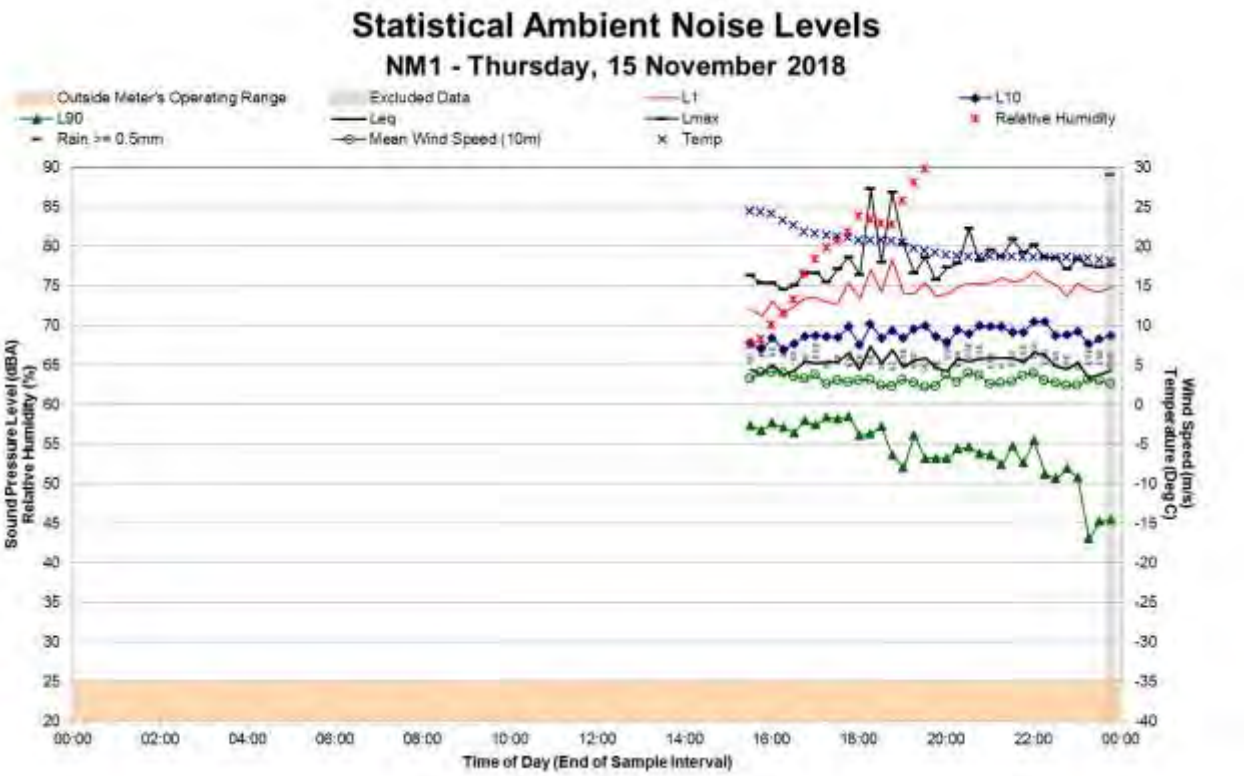
Acoustic Terminology

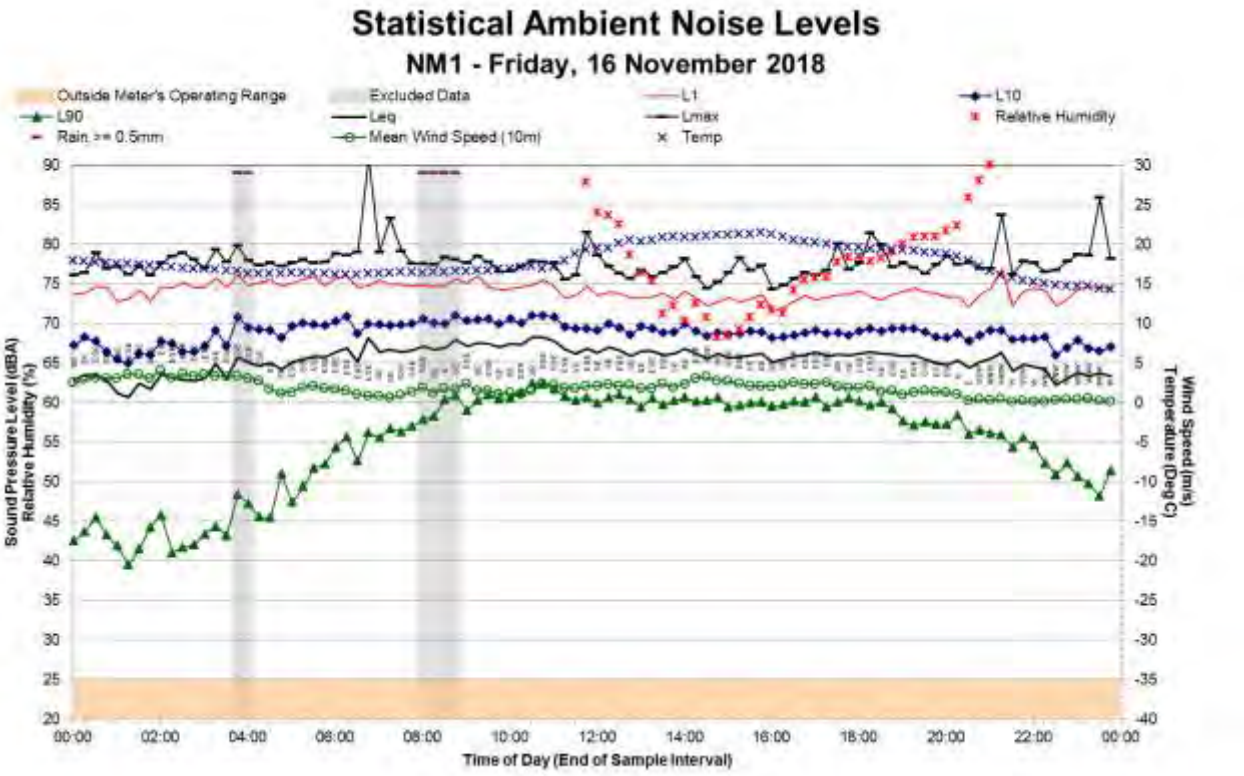
The following is a brief description of the acoustic terminology.

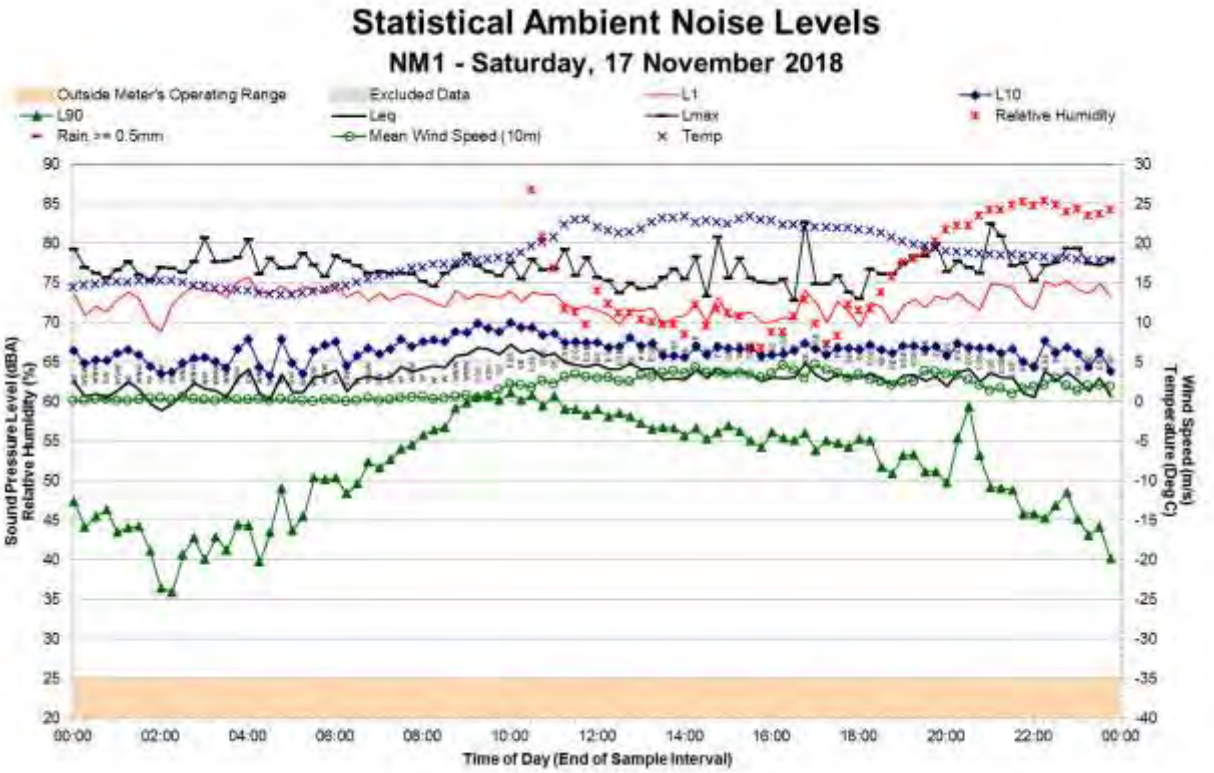
| Acoustic Terminology | Description |
|---|---|
| 'A' Weighted | Frequency filter applied to measured noise levels to represent how humans hear sounds. |
| dBA | 'A' Weighted overall sound pressure level. |
| $L_{90}$ , $L_{10}$ | A statistical measurement giving the sound pressure level which is exceeded for the given percentile of an observation period, i.e., $L_{90}$ is the level which is exceeded for 90 percent of an observation period. $L_{90}$ is commonly referred to as the background sound level. |
| $L_{Amax}$ | Highest value of the A-weighted sound pressure level with a specified time weighting that occurs during a given event. |

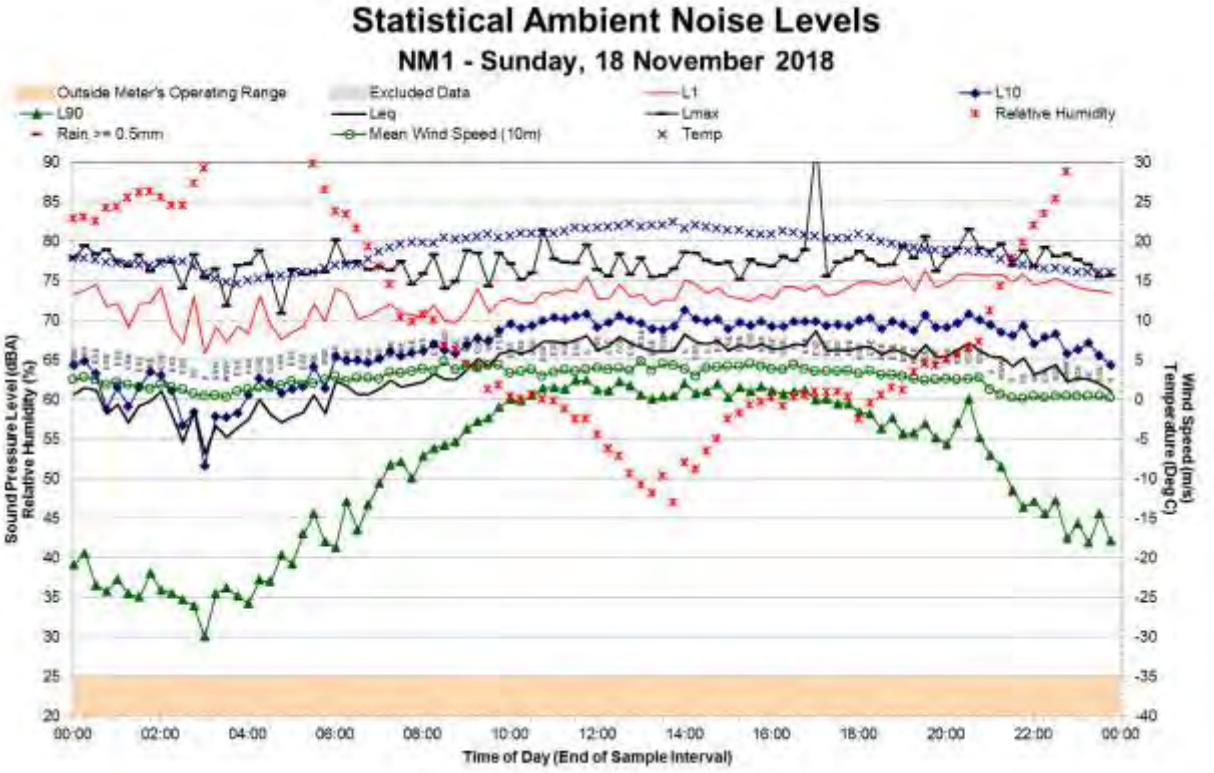
# APPENDIX B

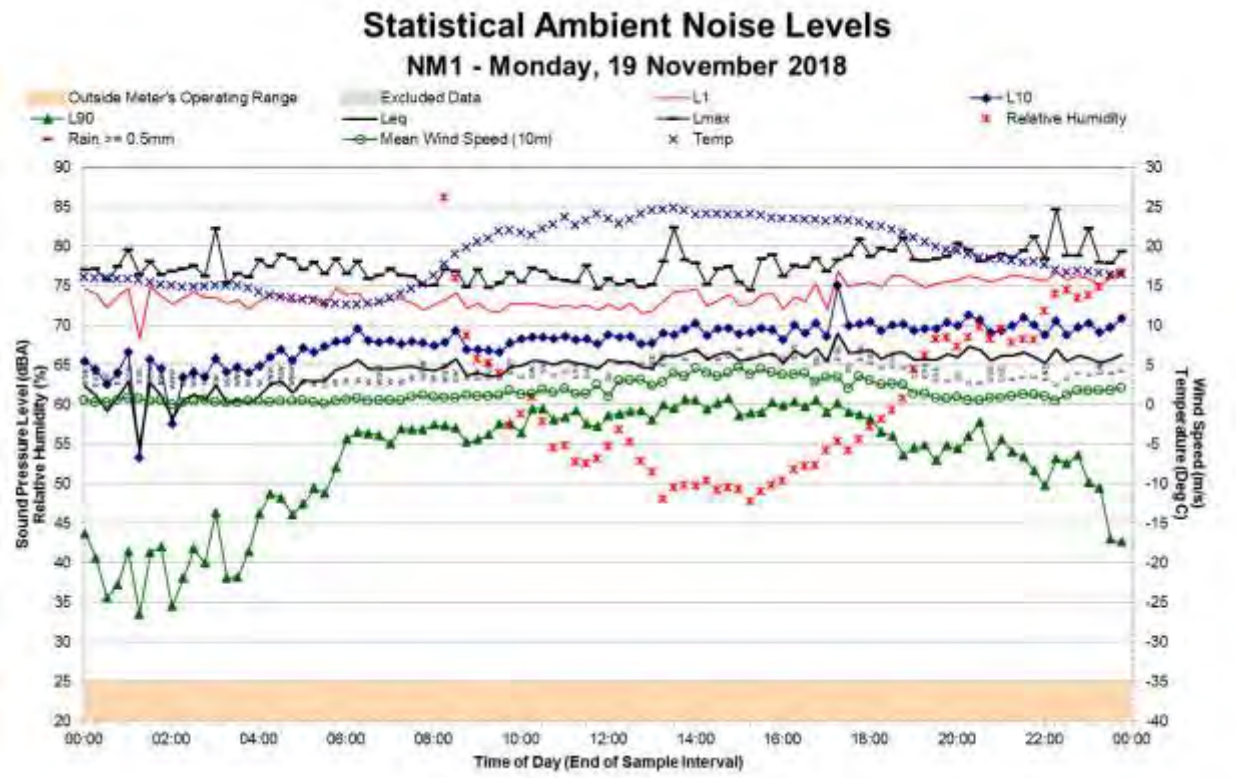
NM1 – Statistical Ambient Noise Levels

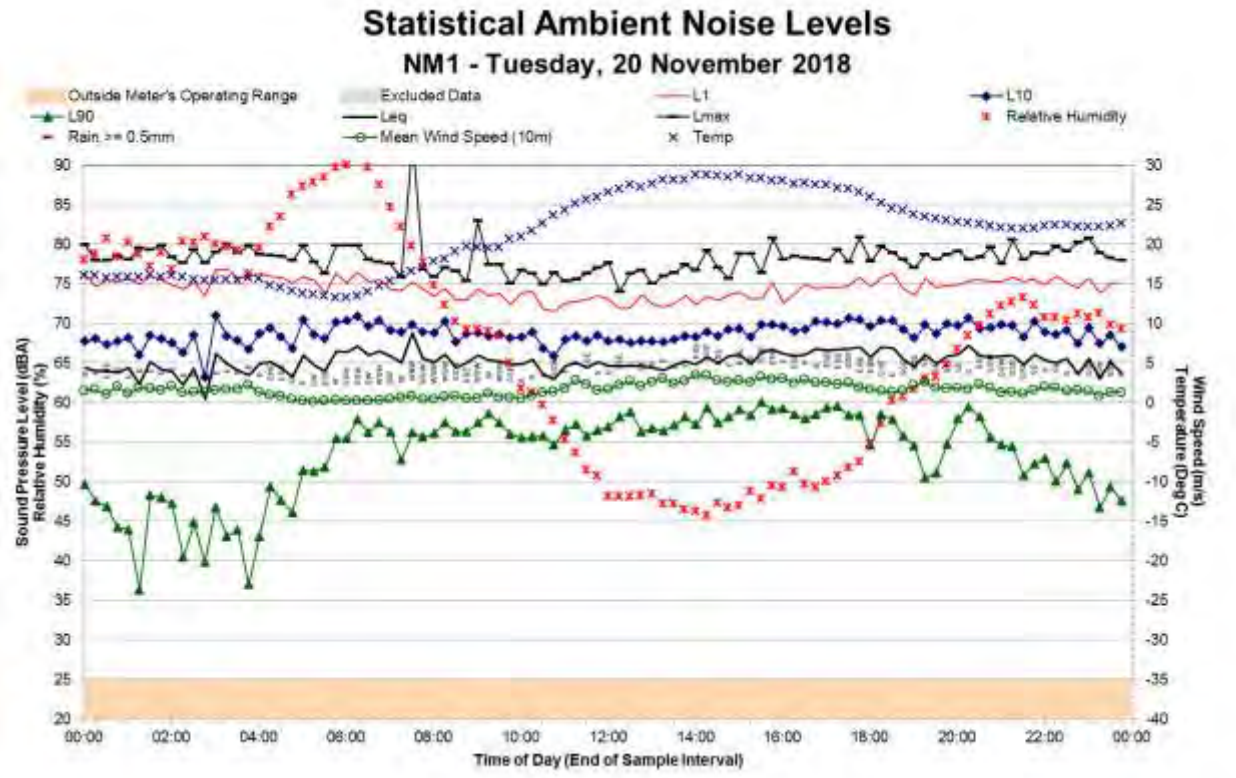

Statistical Ambient Noise Levels
NM1 - Thursday, 15 November 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Lmax
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (10m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
NM1 - Friday, 16 November 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Lmax
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (10m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
NM1 - Saturday, 17 November 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Lmax
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (10m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)

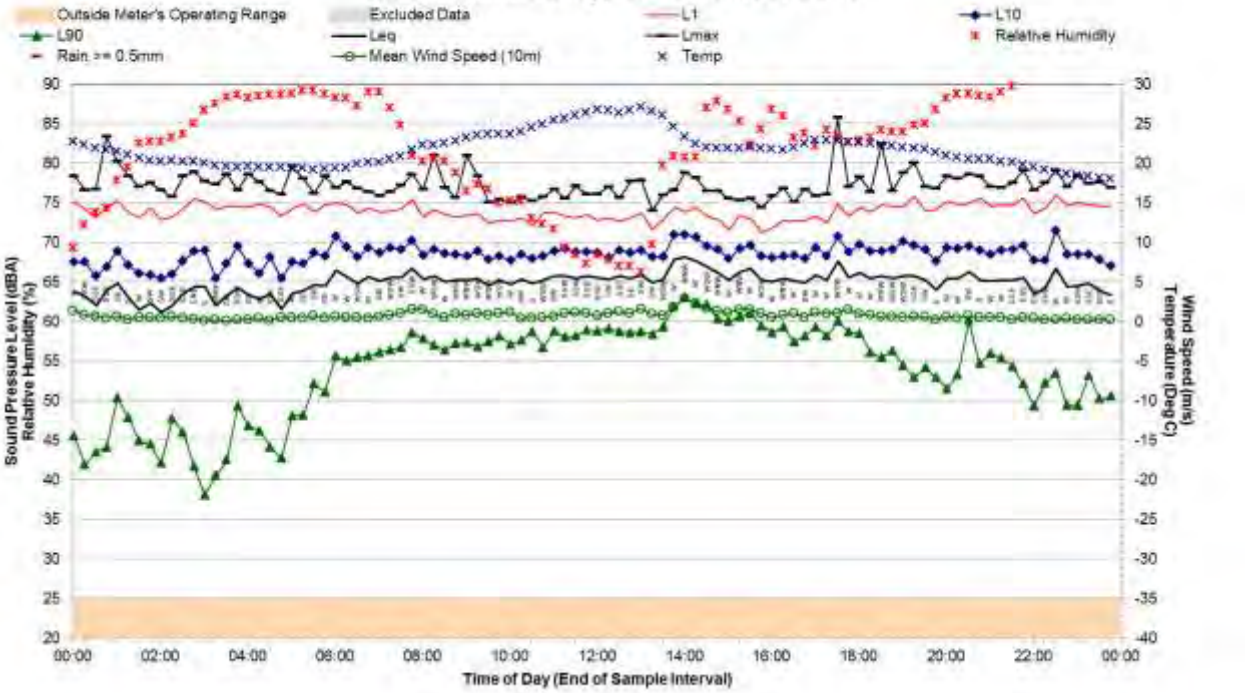

Statistical Ambient Noise Levels
NM1 - Sunday, 18 November 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Lmax
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (10m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
NM1 - Monday, 19 November 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Lmax
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (10m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
NM1 - Tuesday, 20 November 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Lmax
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (10m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)

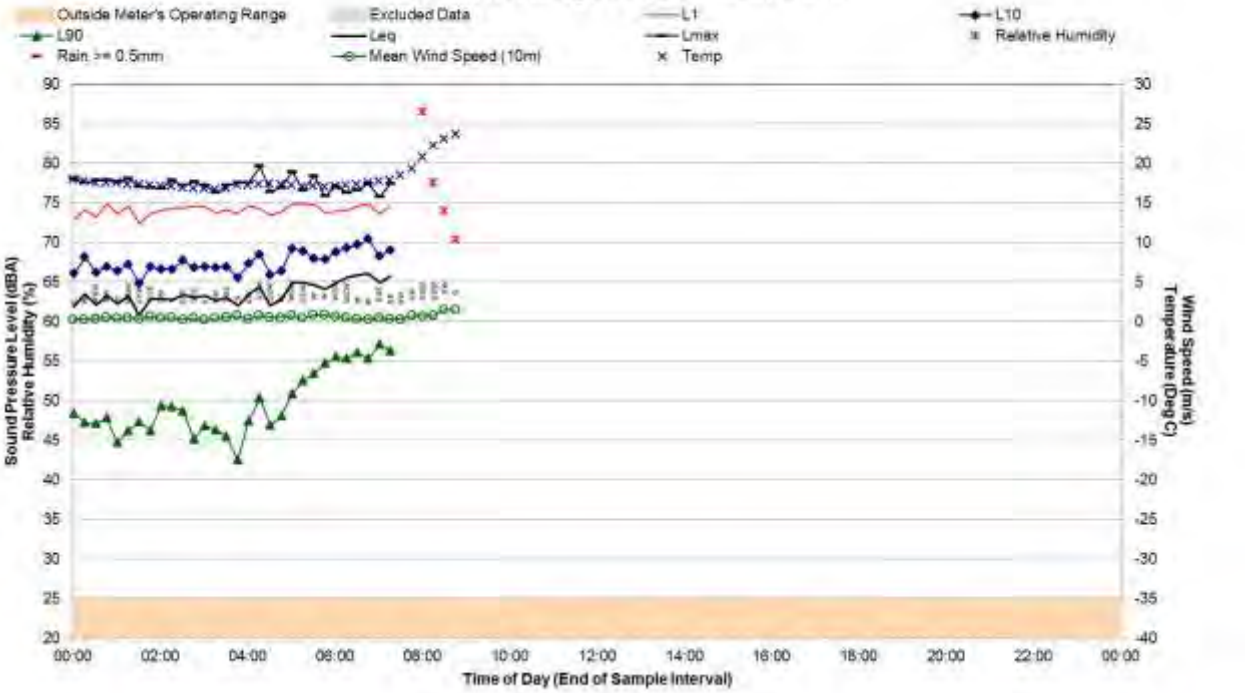
## Statistical Ambient Noise Levels

### NM1 - Wednesday, 21 November 2018



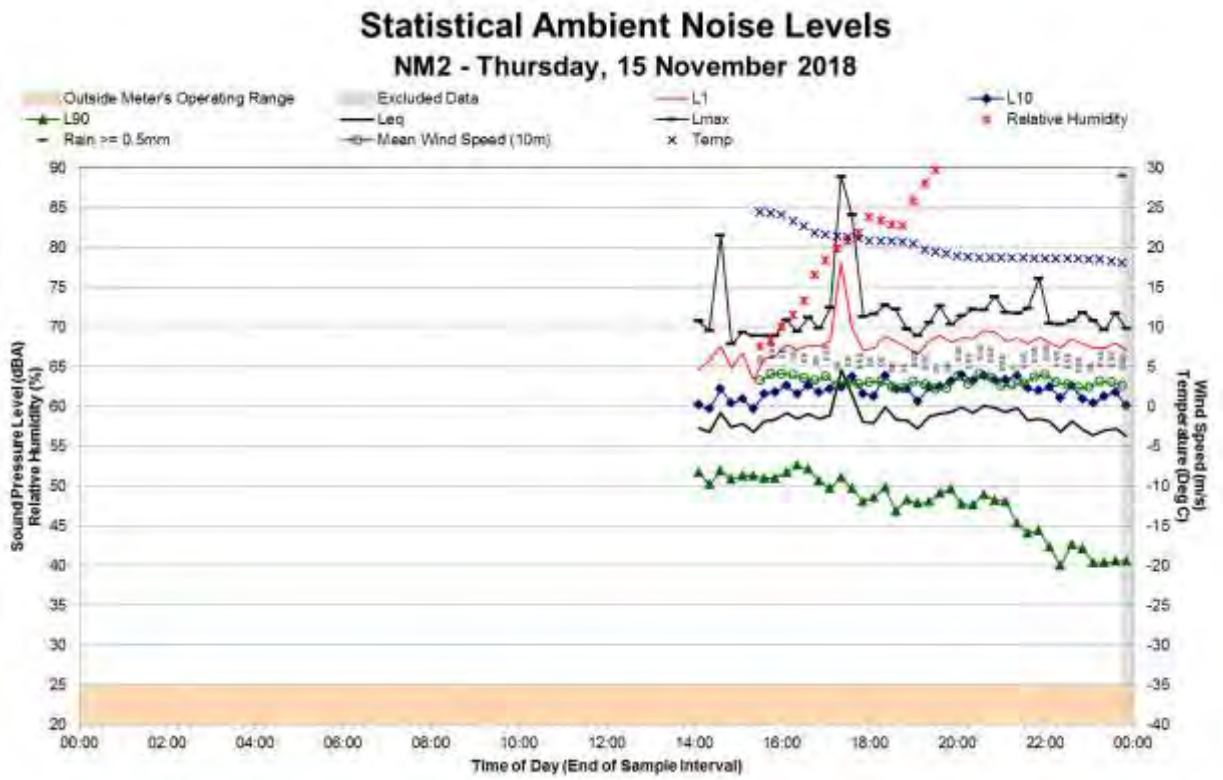

## Statistical Ambient Noise Levels

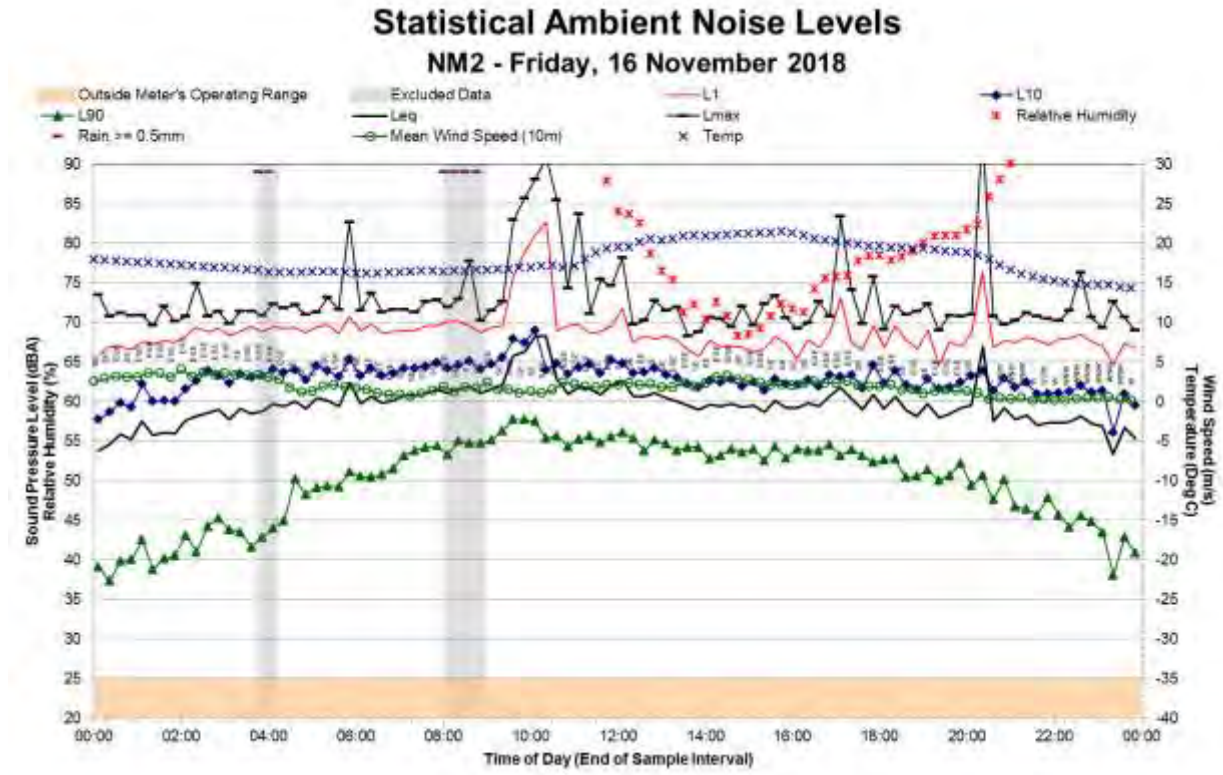
### NM1 - Thursday, 22 November 2018

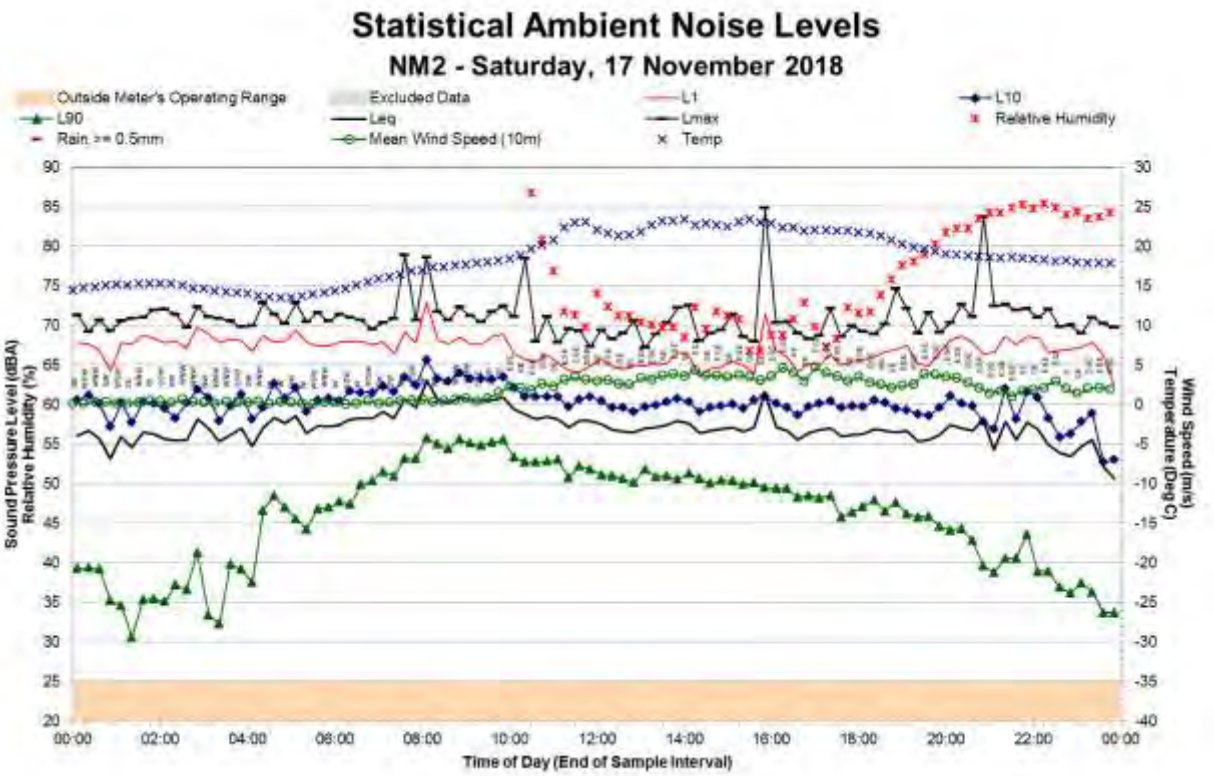


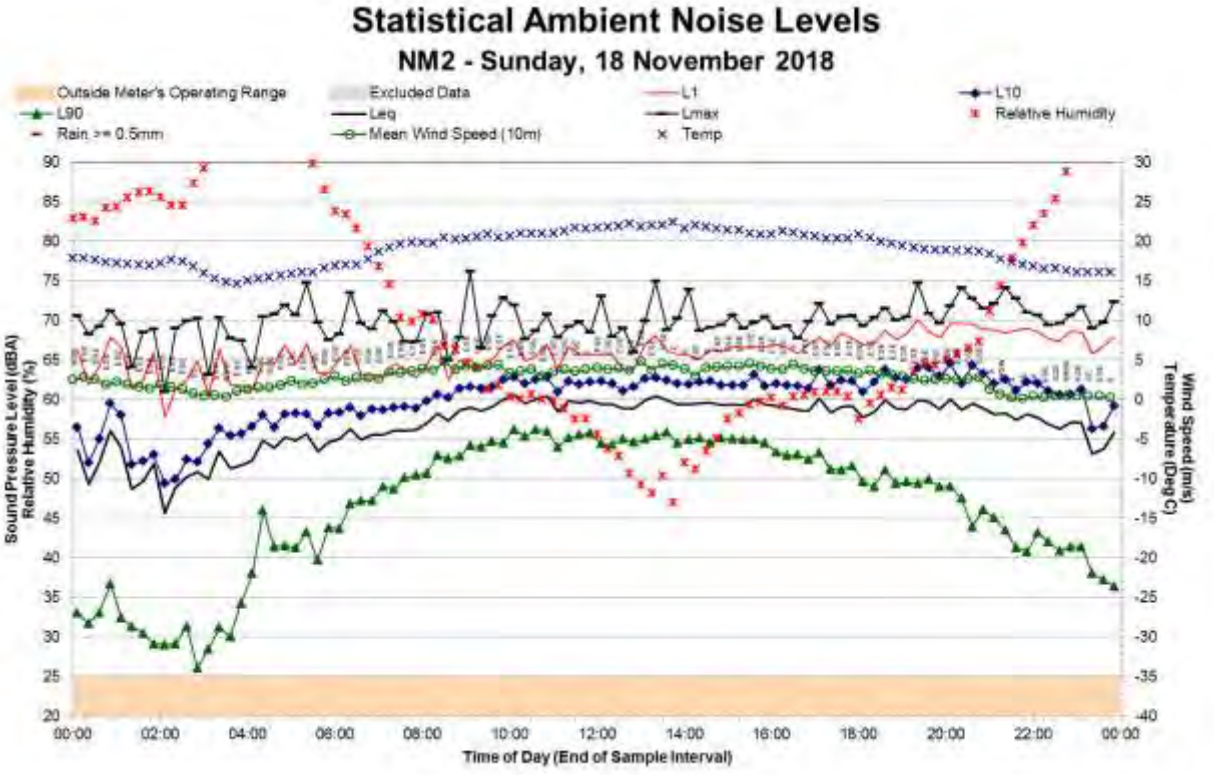
# APPENDIX C

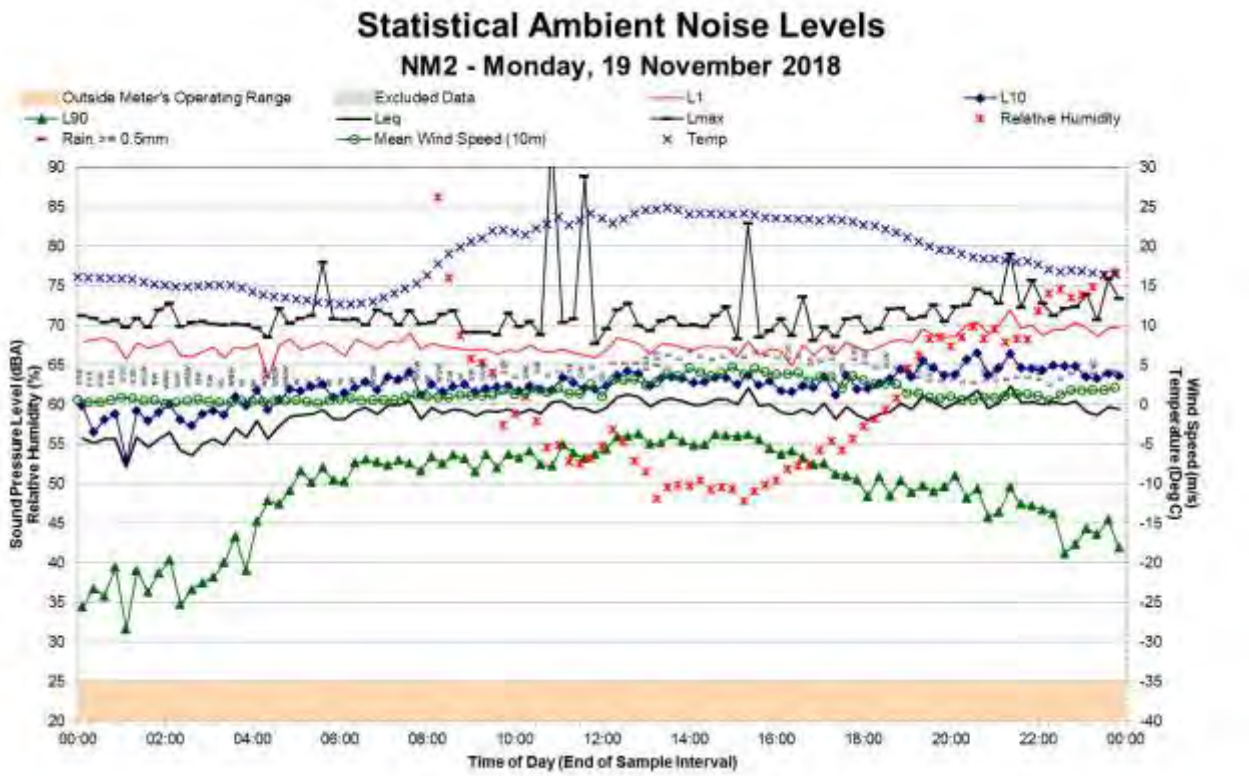
NM2 – Statistical Ambient Noise Levels

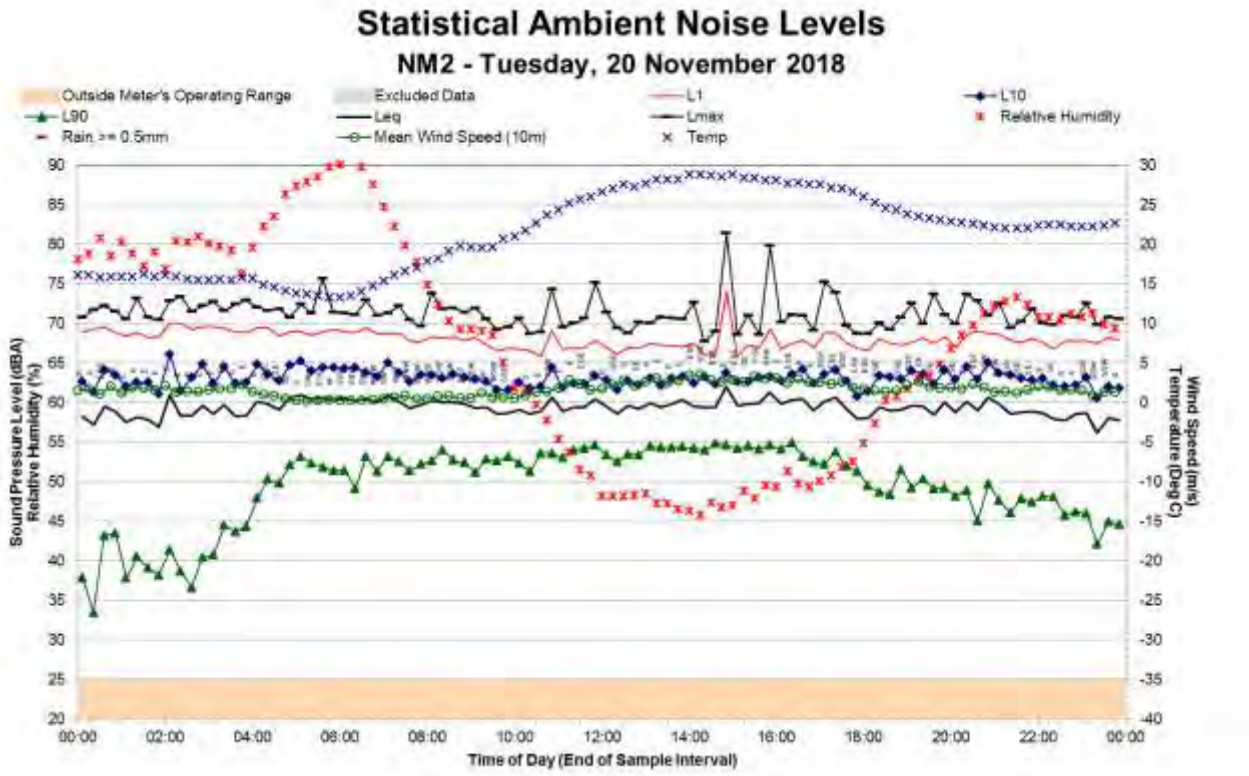

Statistical Ambient Noise Levels
NM2 - Thursday, 15 November 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Lmax
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (10m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)

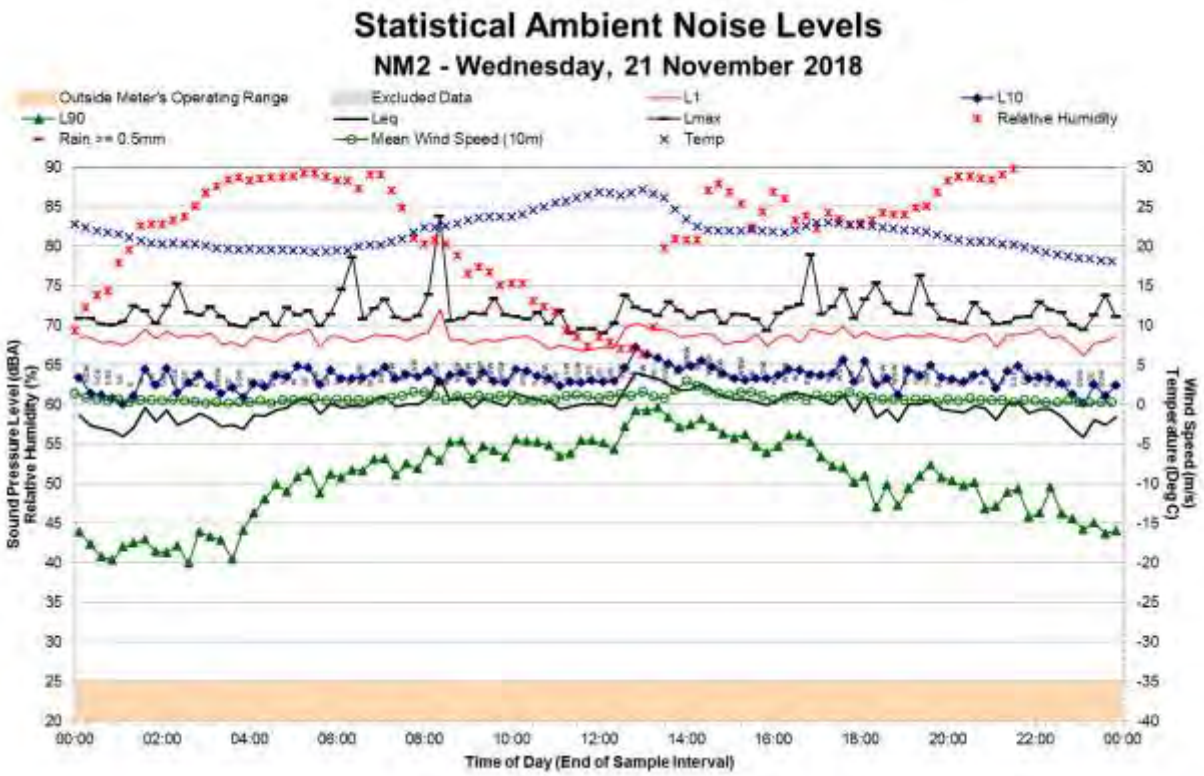

Statistical Ambient Noise Levels
NM2 - Friday, 16 November 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Lmax
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (10m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)

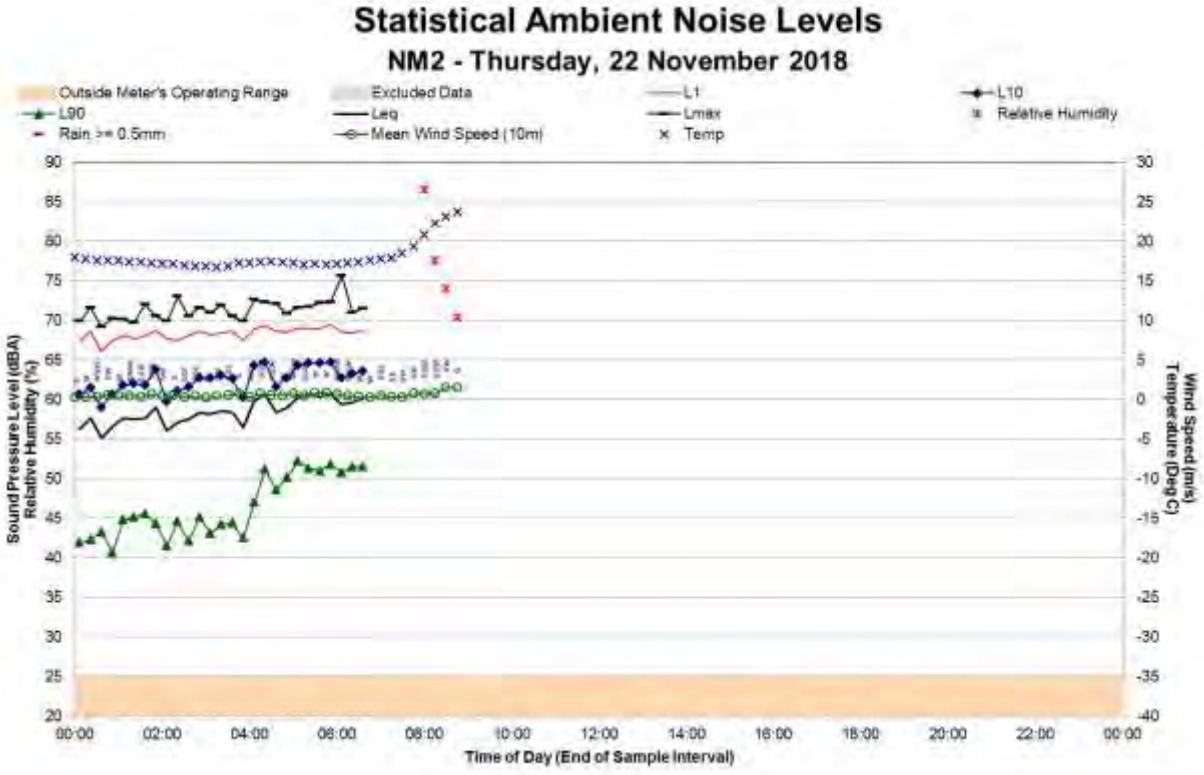

Statistical Ambient Noise Levels
NM2 - Saturday, 17 November 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Lmax
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (10m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
NM2 - Sunday, 18 November 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Lmax
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (10m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
NM2 - Monday, 19 November 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Lmax
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (10m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)

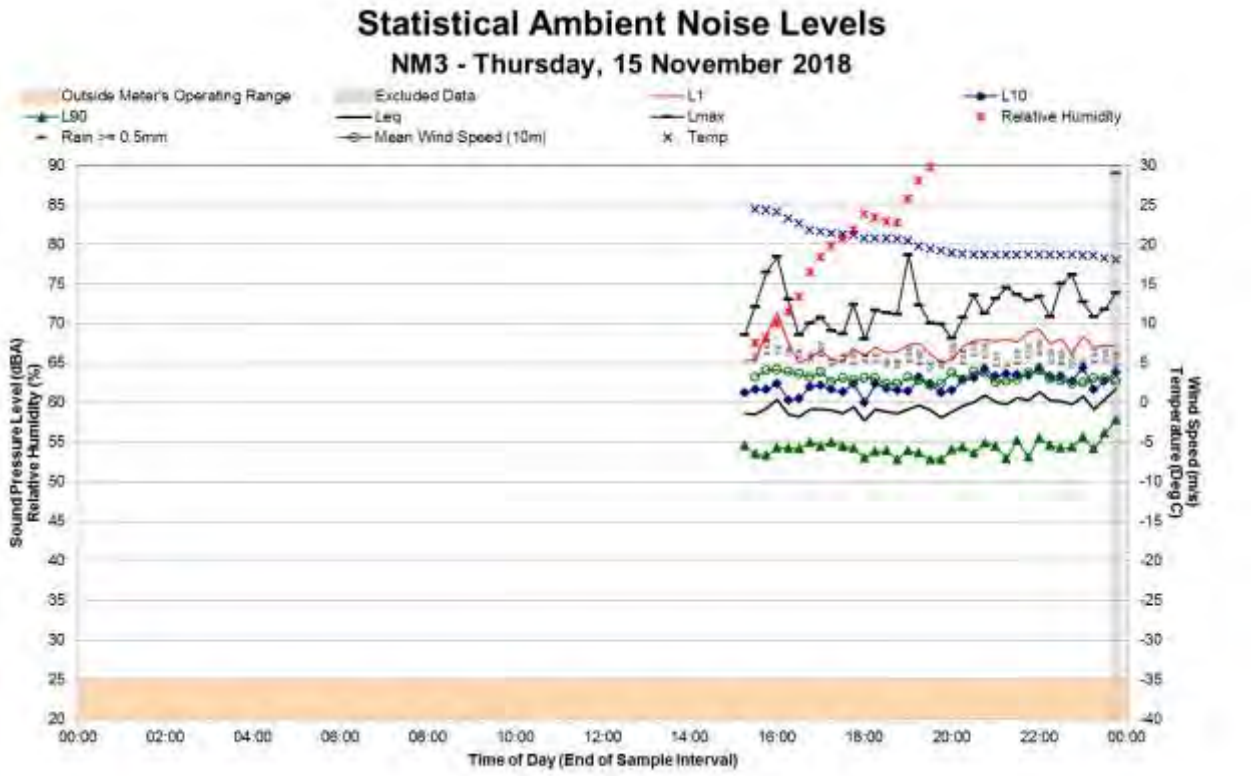

Statistical Ambient Noise Levels
NM2 - Tuesday, 20 November 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Lmax
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (10m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)

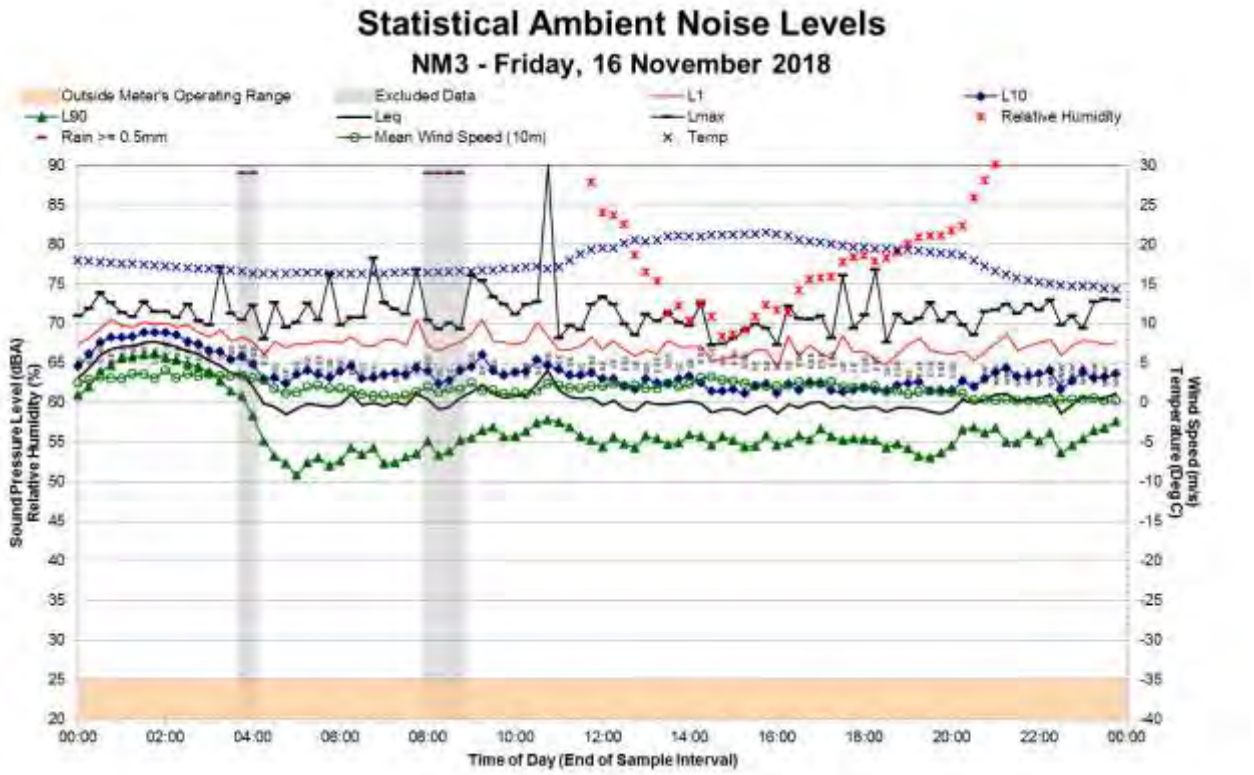

Statistical Ambient Noise Levels
NM2 - Wednesday, 21 November 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Lmax
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (10m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)

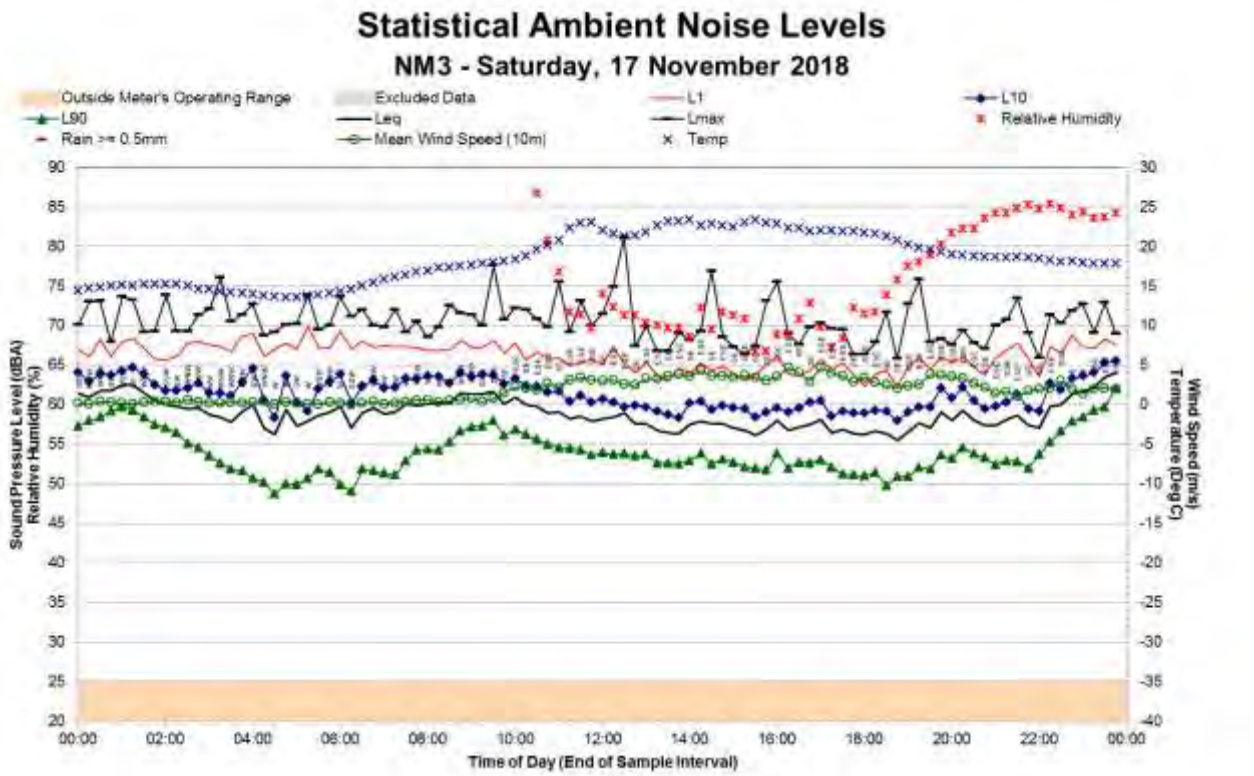

Statistical Ambient Noise Levels
NM2 - Thursday, 22 November 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Lmax
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (10m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (m/s)
Temperature (Deg C)
Time of Day (End of Sample Interval)

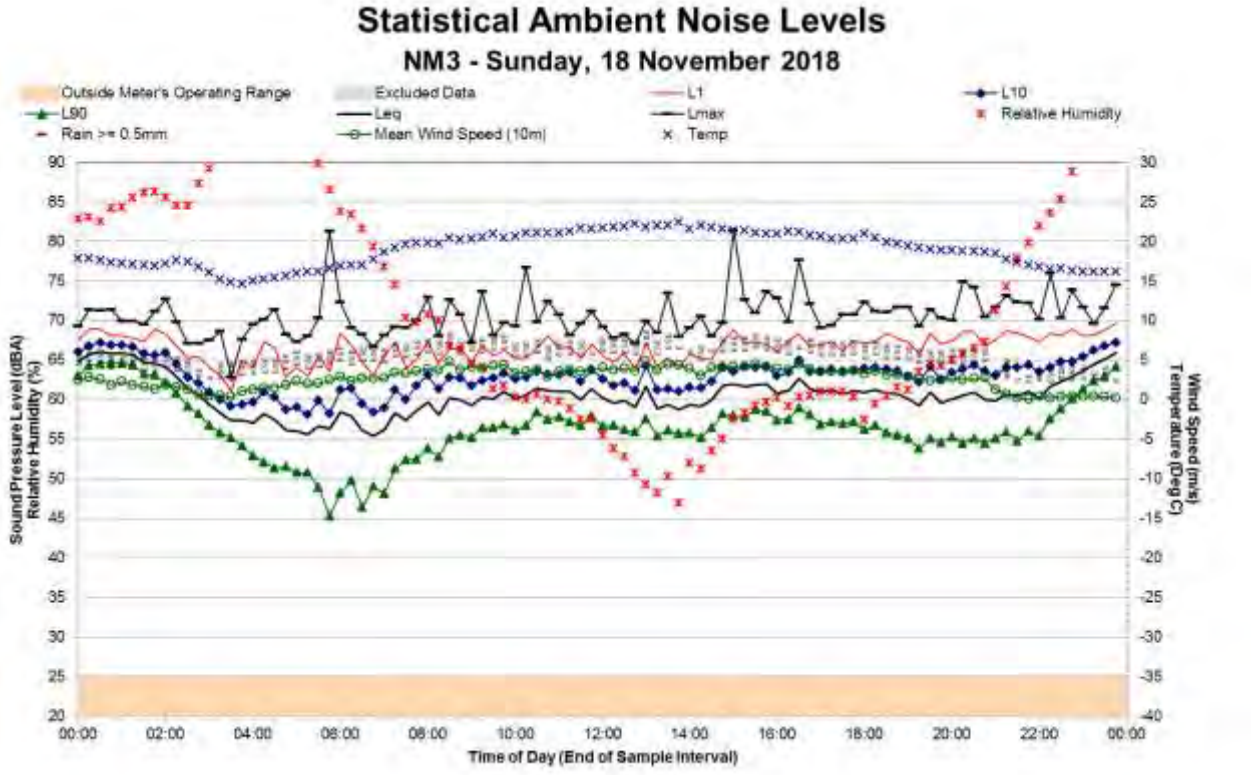
# APPENDIX D

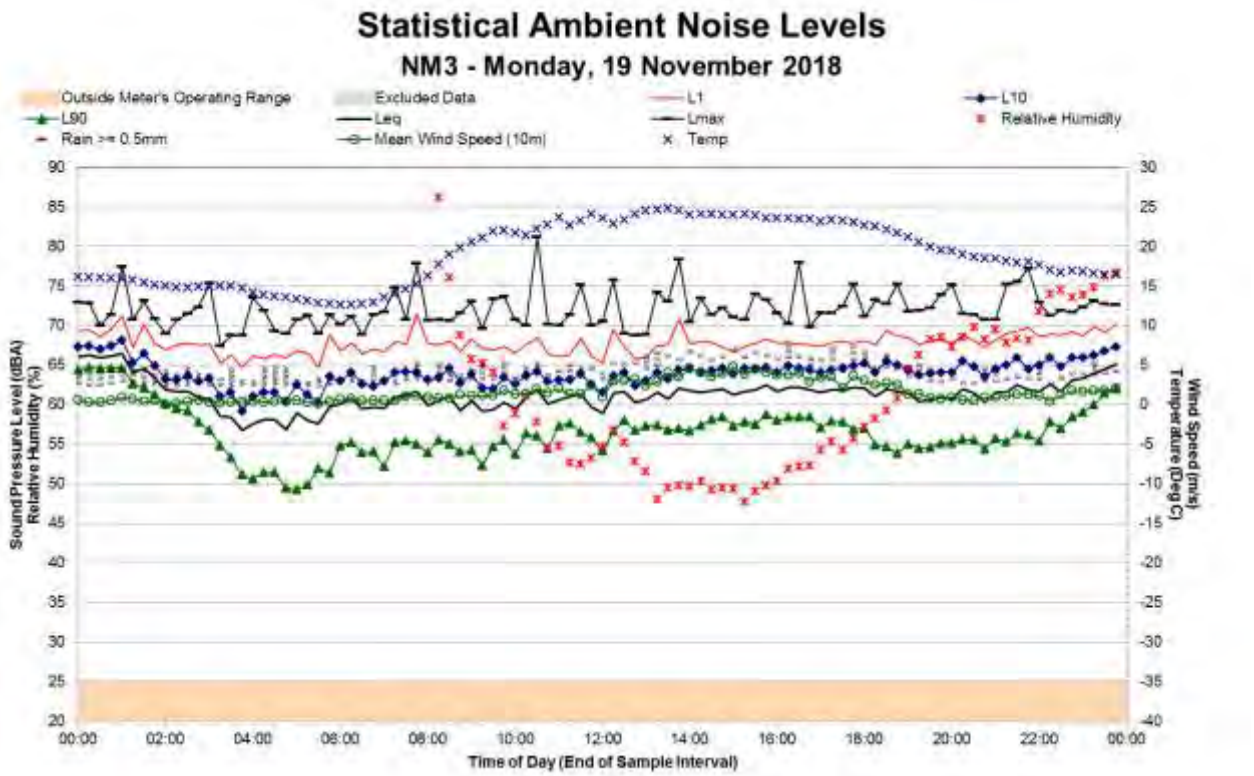
NM3 – Statistical Ambient Noise Levels

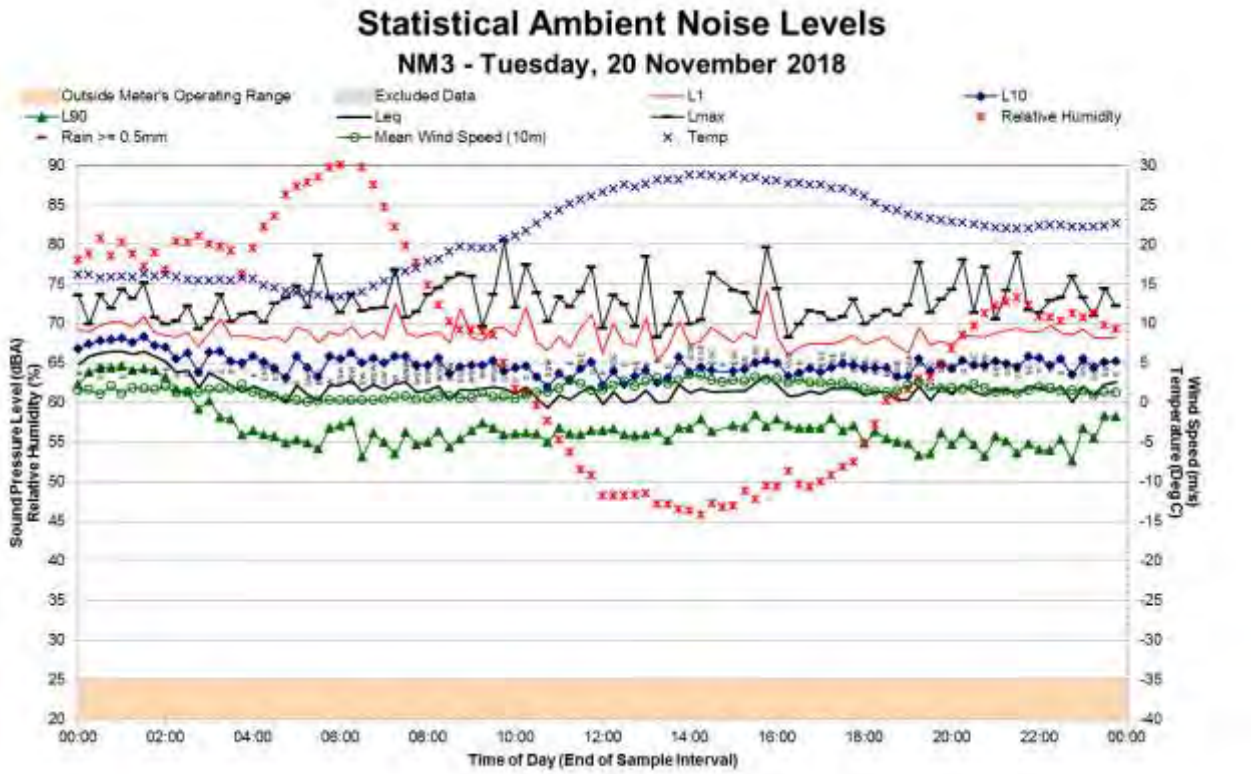

Statistical Ambient Noise Levels
NM3 - Thursday, 15 November 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Lmax
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (10m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Temperature (Deg C)
Wind Speed (m/s)
Time of Day (End of Sample Interval)

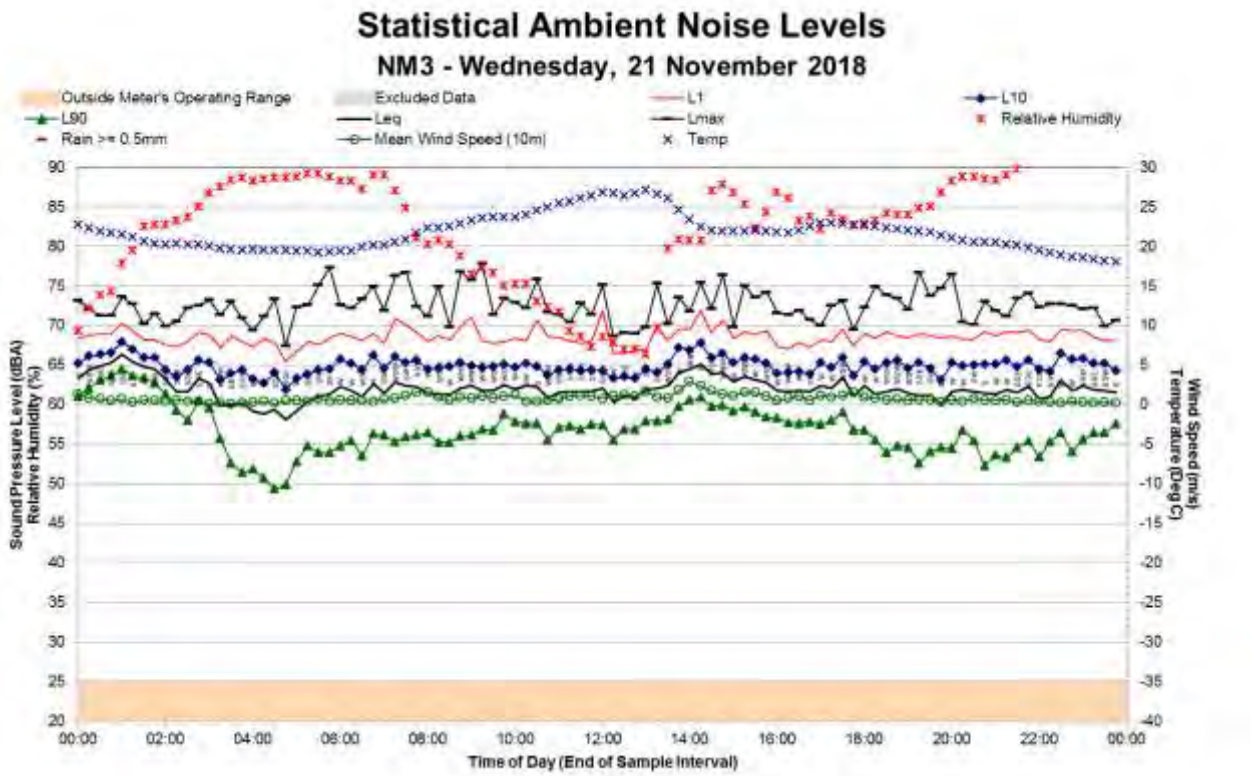

Statistical Ambient Noise Levels
NM3 - Friday, 16 November 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Lmax
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (10m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Temperature (Deg C)
Wind Speed (m/s)
Time of Day (End of Sample Interval)

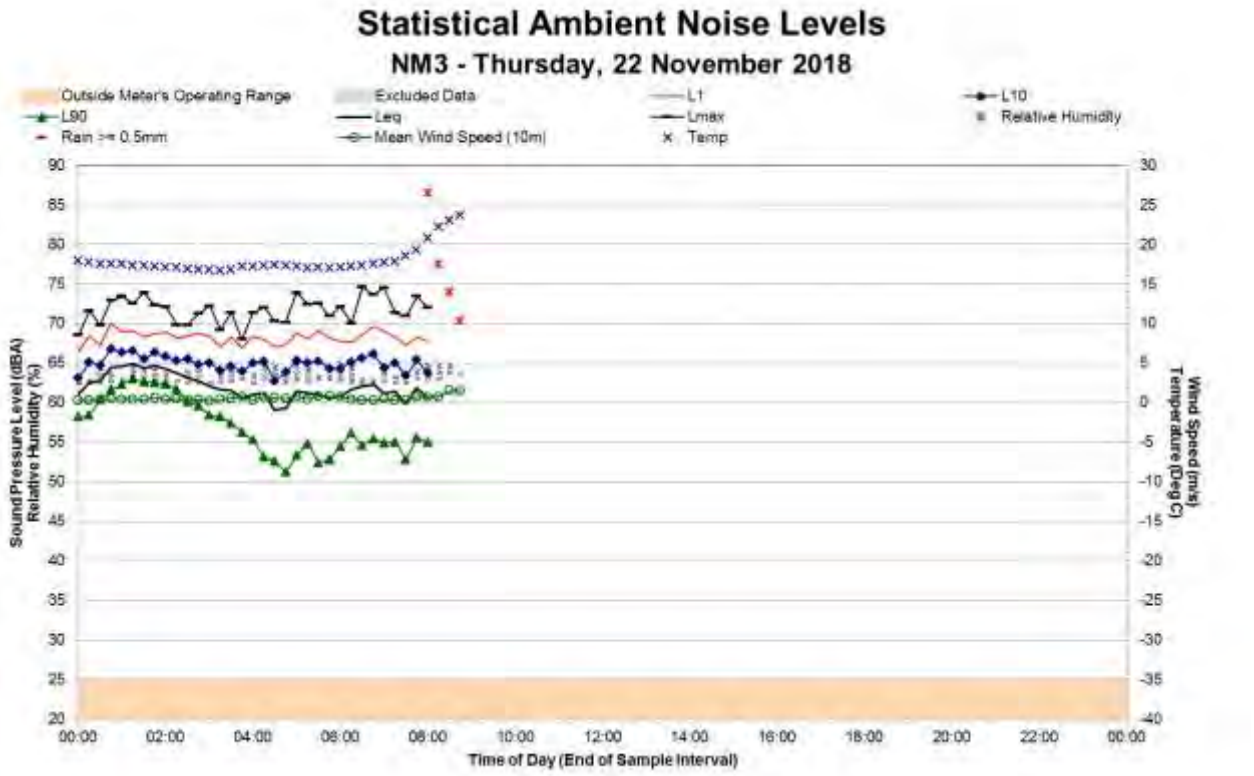

Statistical Ambient Noise Levels
NM3 - Saturday, 17 November 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Lmax
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (10m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Temperature (Deg C)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
NM3 - Sunday, 18 November 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Lmax
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (10m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Temperature (Deg C)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
NM3 - Monday, 19 November 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Lmax
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (10m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Temperature (Deg C)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
NM3 - Tuesday, 20 November 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Lmax
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (10m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Temperature (Deg C)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
NM3 - Wednesday, 21 November 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Lmax
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (10m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Temperature (Deg C)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
NM3 - Thursday, 22 November 2018
Outside Meter's Operating Range
Excluded Data
L1
L10
L90
Leq
Lmax
Relative Humidity
Rain >= 0.5mm
Mean Wind Speed (10m)
Temp
Sound Pressure Level (dBA)
Relative Humidity (%)
Temperature (Deg C)
Wind Speed (m/s)
Time of Day (End of Sample Interval)

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