

Noise Management Plan

Armidale Regional Landfill



Noise Management Plan

Armidale Regional Landfill

Client: Armidale-Dumaresq Council

ABN: 63 781 014 253

Prepared by

AECOM Australia Pty Ltd

Level 21, 420 George Street, Sydney NSW 2000, PO Box Q410, QVB Post Office NSW 1230, Australia

T +61 2 8934 0000 F +61 2 8934 0001 www.aecom.com

ABN 20 093 846 925

03-Jun-2015

Job No.: ARLF-LEMP-RP-0007-NMP

AECOM in Australia and New Zealand is certified to the latest version of ISO9001, ISO14001, AS/NZS4801 and OHSAS18001.

© AECOM Australia Pty Ltd (AECOM). All rights reserved.

AECOM has prepared this document for the sole use of the Client and for a specific purpose, each as expressly stated in the document. No other party should rely on this document without the prior written consent of AECOM. AECOM undertakes no duty, nor accepts any responsibility, to any third party who may rely upon or use this document. This document has been prepared based on the Client's description of its requirements and AECOM's experience, having regard to assumptions that AECOM can reasonably be expected to make in accordance with sound professional principles. AECOM may also have relied upon information provided by the Client and other third parties to prepare this document, some of which may not have been verified. Subject to the above conditions, this document may be transmitted, reproduced or disseminated only in its entirety.

Quality Information

Document Noise Management Plan

Ref ARLF-LEMP-RP-0007-NMP

Date 03-Jun-2015

Prepared by Alexandra Frolich and Matthew Simon

Reviewed by Gayle Greer, Technical Director – Acoustics

Revision History


Revision	Revision Date	Details	Authorised	
			Name/Position	Signature
A	27-Apr-2015	Draft for Council review	Danielle Poirier, Associate Director - Environment	
B	27-Apr-2015	Reviewed by Council	Mike Brooks Senior Engineer Utilities	
C	18-May-2015	Issue to EPA for consultation	Danielle Poirier, Associate Director - Environment	
D	3-Jun-2015	Issue to DP&E for approval	Danielle Poirier, Associate Director - Environment	

Table of Contents

Abbreviations		i
1.0	Introduction	1
	1.1 Project Background	1
	1.1.1 Consultation	1
	1.2 Purpose and Scope	1
	1.3 Structure of this Plan	1
2.0	Statutory Requirements	3
	2.1 Project Approval Requirements (PA 06_0220)	3
	2.1.1 Noise Limits	3
	2.1.2 Noise Easement	4
	2.1.3 Noise Management Plan	4
	2.2 Licenses and Permits	4
	2.3 Relevant Legislation and Guidelines	5
3.0	Noise at the Site	6
	3.1 Sensitive Receivers	6
	3.2 Potential Noise Impacts	6
	3.2.1 Construction	6
	3.2.2 Operation	7
	3.2.3 Road Traffic	7
4.0	Roles and Responsibilities	8
	4.1 Qualifications and Training	8
5.0	Management Measures	9
	5.1 Construction Noise Management	9
	5.2 Operational Noise Management	9
	5.2.1 Noise Attenuation - Heavy Equipment	9
	5.2.2 Noise Attenuation - Reversing Alarms	10
	5.2.3 Fixed Equipment	10
	5.2.4 Staging Plan	10
	5.2.5 Location of Stockpiles	10
	5.2.6 Mobile Noise Barriers	10
6.0	Monitoring Program	11
	6.1 Noise Monitoring Locations	11
	6.2 Monitoring approach	11
	6.2.1 Construction attended noise monitoring	11
	6.2.2 Operational unattended real time noise monitoring	11
	6.2.3 Operational attended noise monitoring	13
	6.3 Monitoring procedure	13
	6.4 Monitoring of equipment procedure	13
	6.5 Personnel	13
	6.6 Equipment	13
	6.7 Weather monitoring	14
	6.7.1 Weather monitoring instrumentation	14
	6.7.2 Monitoring conditions	14
	6.8 Monitoring and reporting schedule	14
	6.8.1 Construction monitoring schedule	14
	6.8.2 Operational noise monitoring schedule	15
	6.9 Reporting	15
	6.9.1 Reporting details	15
	6.9.2 Record keeping	15
	6.10 Non-compliance and remedial measures	16
	6.11 Noise easement	16
7.0	Complaints handling procedure and community consultation	17
8.0	Review and continual improvement	18
9.0	References	19

Appendix A

Consultation with EPA on NMP

A

Abbreviations

AAAC	Association of Australian Acoustical Consultants
AAS	Australian Acoustical Society
BATEA	Best Available Technology Economically Achievable
BMP	Best Management Plan
DECC	Department of Environment and Climate Change
DP&E	Department of Planning and Environment
EPA	Environment Protection Authority
LEMP	Landfill Environmental Management Plan
LGA	Local Government Agency
NMP	Noise Management Plan

1.0 Introduction

1.1 Project Background

Armidale Dumaresq Council (Council) has obtained approval for the construction and operation of a new regional landfill facility to service the Armidale, Uralla, Walcha and Guyra Local Government Areas (LGA). The landfill facility is located on Waterfall Way, approximately 12 km east of Armidale.

The Planning Assessment Commission, as delegate for the NSW Minister for Planning and Infrastructure, granted approval for the project under Section 75J of the *Environmental Planning and Assessment Act 1979*, subject to conditions, on 4 July 2012 (Approval 06_0220).

Noise emissions associated with the construction and operation of the Armidale Regional Landfill have the potential to impact on nearby sensitive receivers. The main noise generators will be mobile plant and truck movements on the site during construction or operation, or noise associated with fixed plant operations (e.g. generators) which are continuous in nature.

AECOM has been engaged by Council to prepare a Noise Management Plan for the new landfill.

1.1.1 Consultation

A copy of this Plan was provided to the NSW Environment Protection Authority (EPA) in accordance with consultation requirements under Condition 18(a) of the Project Approval, on 22 May 2015. The EPA responded on 3 June 2015: *EPA policy is that it will not endorse site management plans required by project approval conditions. However I can confirm that EPA have reviewed the Noise Management Plan and that it will not be making further comment* (Appendix A). No formal consultation was required with the local community under this condition.

1.2 Purpose and Scope

Conditions 15, 16, and 17/Schedule 4 of the Conditions of Approval identify operating hours and noise limits for the landfill.

Condition 18/Schedule 4, of the Conditions of Approval requires the preparation of a Noise Management Plan for the project in consultation with the EPA and submitted to the Secretary of the (now) Department of Planning and Environment (DP&E) for approval.

This Noise Management Plan (NMP) satisfies *Condition 18*. The NMP also fulfils the requirements of Conditions 15, 16 and 17, identifying the operating hours of the landfill and the noise management measures that will be implemented over the life of the project so that noise generated by the construction and operation of the landfill is within the specified limits.

1.3 Structure of this Plan

The NMP is structured as follows:

Section 1.0 – Introduction

Section 2.0 – Statutory Requirements

Section 3.0 – Noise Limits

Section 4.0 – Noise at the Site

Section 5.0 – Roles and Responsibilities

Section 6.0 – Management Measures

Section 7.0 – Monitoring Program

Section 8.0 - Complaints Handling Procedures

Section 9.0 – Review and Continual Improvement

Section 10.0 - References

This NMP forms part of the project's Landfill Environmental Management Plan (LEMP) as shown in Figure 1.

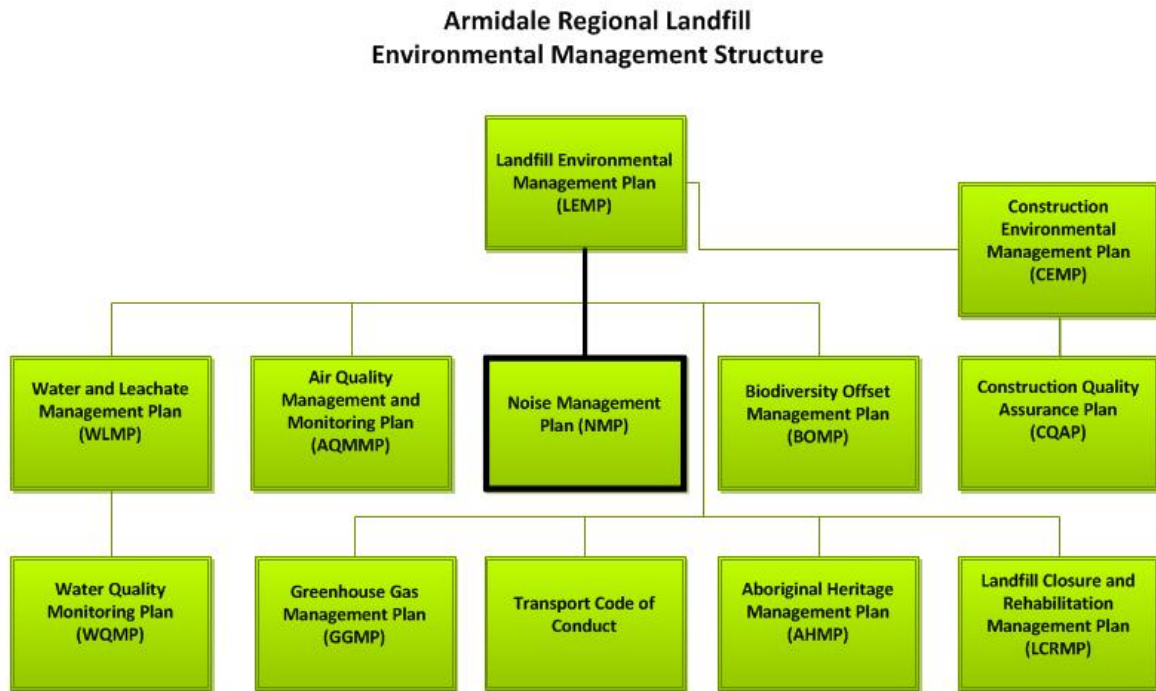


Figure 1 Environmental Management Structure

2.0 Statutory Requirements

2.1 Project Approval Requirements (PA 06_0220)

The Project Approval includes the required construction and operational activities that Armidale Dumaresq Council must adhere to and outlines the main requirements for this NMP. Conditions 15, 16, 17 and 18 under Schedule 4 of the Conditions of Approval for PA 06_0220 set the noise related requirements for the project. These Conditions are presented below.

2.1.1 Noise Limits

Operating Hours

15. The Proponent shall comply with the operating hours in Table 2.

Table 2 Operating Hours

Activity	Day	Hours
Construction	Monday – Friday	7 am – 5 pm
	Saturday	8 am – 1 pm
	Any Other Time	Only with the prior written approval of EPA and subject to any conditions that may be imposed.
Operation	Monday – Friday	7 am – 5:30 pm
	Saturday	8 am – 6 pm
	Any Other Time	Only during an emergency. The details of any such incident must be reported in accordance with schedule 5, condition 6.

Noise Limits

16. The Proponent shall ensure that the noise generated by the project does not exceed the emission limits in Table 3.

Table 3 Noise emission limits dB(A)

Receiver	Limit -
Residences on privately-owned land during construction	$L_{Aeq(15\text{ minute})}$ 40 dB(A)
Residences on privately-owned land during operations	$L_{Aeq(15\text{ minute})}$ 35 dB(A)
Residence on privately owned land known as 'Sherraloy' during operation of cell 1 only	$L_{Aeq(15\text{ minute})}$ 38 dB(A)

Notes:

- $L_{Aeq(15\text{ minute})}$ is the level of noise equivalent to the average of noise levels occurring over the measured period (i.e. 15 minutes).
- For the purpose of noise measures required for this condition, the L_{Aeq} noise level must be measured or computed at any point within 30 metres of any residence not on the premises over a period of 15 minutes using "FAST" response on the sound level meter. Where it can be demonstrated that direct measurement at such a location is impractical, an alternative means of determining compliance under Chapter 11 of the NSW Industrial Noise Policy may be acceptable.
- Modification factors in Section 4 of the NSW Industrial Noise Policy apply to the measured noise levels.
- The noise emission limits apply under all meteorological conditions except during rain and wind speeds greater than 3 m/s at 10 m height; and under "non-significant weather conditions". Field meteorological indicators for non-significant weather conditions are described in the NSW Industrial Noise Policy, Chapter 5 and Appendix E in relation to wind and temperature inversions

2.1.2 Noise Easement

17. Before operation commences a noise-easement must be registered on the title of the residual lot containing the dwelling on the farm 'Sherraloy' allowing the noise criteria as specified in condition 16 of this Schedule.

2.1.3 Noise Management Plan

18. The Proponent must prepare and implement a Noise Management Plan (NMP) prior to commencement of operation that covers all premises based activities and transport operations. The plan must:
- be prepared in consultation with the EPA by a suitably qualified and experienced expert whose appointment has been endorsed by the Secretary;
 - be approved by the Secretary prior to the commencement of construction;
 - include a system that allows for periodic assessment of Best Management Practice (BMP) and Best Available Technology Economically Achievable (BATEA) that has the potential to minimise noise levels from the facility;
 - specify effective implementation of identified BMP and BATEA measures, where considered feasible and reasonable;
 - include a program for monitoring the noise impacts of the project including real time noise monitors to measure noise emissions during operation;
 - include measures to record and respond to complaints;
 - include measures for community consultation including site contact details;
 - include specifications and protocols for the installation and relocation of mobile noise barriers; and
 - describe mitigation measures that would be implemented in the event that a non-compliance is identified with the noise impact assessment criteria in this approval.

Table 1 indicates where each component of the conditions is addressed within this NMP.

Table 1 Management Plan Requirements

Project Approval Condition	Plan Section
Schedule 4/Condition 15	2.1.1
Schedule 4/Condition 16	2.1.1
Schedule 4/Condition 17	6.11
Schedule 4/Condition 18a	1.1.1 & App A
Schedule 4/Condition 18b	TBA
Schedule 4/Condition 18c	5.0, 6.0 & 8.0
Schedule 4/Condition 18d	5.0
Schedule 4/Condition 18e	6.0
Schedule 4/Condition 18f	7.0
Schedule 4/Condition 18g	4.0 & 7.0
Schedule 4/Condition 18h	5.2.6
Schedule 4/Condition 18i	6.10

2.2 Licenses and Permits

The operation of the landfill will require an Environment Protection Licence as prescribed under the *Protection of the Environment Operations Act 1997*.

2.3 Relevant Legislation and Guidelines

This NMP has been prepared in accordance with the following guidelines, standards and reports:

- NSW EPA – *NSW Industrial Noise Policy (INP)*, January 2000 and relevant Application Notes, 2013
- NSW EPA – *NSW Road Noise Policy (RNP)*, March 2011
- NSW Department of Environment and Climate Change (DECC) – *Interim Construction Noise Guideline (ICNG)*, July 2009
- Standards Australia AS1055-1997™ (AS1055) - *Description and Measurement of Environmental Noise*, Parts 1, 2 and 3
- Standards Australia AS IEC 61672.1-2004™ (AS61672) - *Electro Acoustics - Sound Level Meters Specifications*
- Standards Australia AS 2436-2010™ (AS2436) - *Guide To Noise And Vibration Control On Construction, Demolition And Maintenance Sites*
- International Organisation for Standardisation (ISO) 9613-2:1996 (ISO9613:2) - *Acoustics - Attenuation Of Sound During Propagation Outdoors - Part 2: General Method Of Calculation*
- *Armidale Regional Landfill Noise Impact Assessment* - prepared by AECOM, 2010.
- Project Approval (06_0220) and other relevant project information provided by Council.

3.0 Noise at the Site

3.1 Sensitive Receivers

The noise environment surrounding the landfill is typical of rural areas, with ambient noise levels during the day dominated by rural human activity, animals and intermittent traffic. Natural sounds such as wind in trees and grass and small contributions of industrial noise from distant water pumps are also audible.

The nearest residential properties, Strathaven and Sherraloy are located 950 metres west and 410 metres south of the project respectively (shown in Figure 2).



Figure 2 Location of nearest noise receivers

3.2 Potential Noise Impacts

3.2.1 Construction

During construction, noise impacts are anticipated to arise from the equipment used in ancillary site preparation works, including partial clearing of the site, the construction of the site access and maintenance roads, drainage works, construction traffic movements, landscaping works and excavation of the landfill area.

Construction is likely to require the following equipment operating on the site:

- Trucks and utility vehicles
- Compactor
- Grader / Scraper
- Excavator
- Dozer.

Equipment will be distributed and operational across the site. However, a worse-case scenario exists where the equipment is predominantly (and concurrently) working at the extremities of the construction area (nearest to Receivers 1 and 2 – Strathaven and Sherraloy). The predicted noise level for this worst-case scenario is shown in Table 2.

Table 2 Predicted noise levels from all plant operating during daytime under neutral meteorological conditions.

Receiver	Leq dB(A)	Construction Noise Criteria
Strathaven	36	$L_{Aeq(15\text{ minute})}$ 40 dB(A)
Sherraloy	38	<i>During construction of Cell 1 only:</i> $L_{Aeq(15\text{ minute})}$ 38 dB(A) <i>During construction of all other cells:</i> $L_{Aeq(15\text{ minute})}$ 40 dB(A)

3.2.2 Operation

Operational noise will be generated by equipment used at the site in the daily operation of the landfill. Noise is expected to be generated from trucks delivering the waste, compaction, grading and covering of the waste materials. It is not anticipated that all equipment would be operating at the same time. However, a worst-case scenario exists where the equipment is predominantly (and concurrently) working at the extremities of the landfill (Cell 1, nearest to Receivers 1 and 2 – Strathaven and Sherraloy). The predicted noise level for this worst-case scenario (and without mitigation) is shown in Table 3.

Table 3 Predicted noise levels during operation under neutral meteorological conditions

Receiver	Operational Noise Criteria	Location of equipment					
		Cell 1		Cell 3		Cell 5	
		Fill	Cover	Fill	Cover	Fill	Cover
Strathaven	35	33	34	33	35	34	35
Sherraloy	35	40*	43*	28	35	27	31

*Denotes exceedance of environmental criterion

The analysis of operational noise impacts indicated that without noise mitigation there is potential for exceedance of the environmental criteria during operations in Cell 1. Therefore, mitigation measures are required and these have been specified in this NMP (refer Section 5.2).

3.2.3 Road Traffic

During operation, the landfill facility is expected to generate up to 3 waste vehicles to and from the site per day (total of 6 movements). Up to 2 staff vehicles to and from the site (total of 4 movements) may also be required from time to time.

The increase in traffic noise levels along Waterfall Way and in the vicinity of the Long Swamp Road facility was previously assessed and the landfill facility would not exceed traffic noise criteria for Waterfall Way, Long Swamp Road and Canambe Street (AECOM, 2010).

4.0 Roles and Responsibilities

Roles for the NMP are consistent with the overarching LEMP (ARLF-LEMP-RP-0001). Responsibilities for the implementation of the NMP are summarised in Table 4.

Table 4 Summary of Responsibilities

Responsibility within Council	Action
Waste Manager	<ul style="list-style-type: none"> - Overall implementation of the Noise Management Plan - Implement methodology for avoiding excessive noise emissions - Authorise and confirm the implementation of mitigation measures
Site Environmental Officer/ Waste Superintendent	<ul style="list-style-type: none"> - Coordinate monitoring and compile reports - Maintain internal records of monitoring - Collate and maintain records of complaints, respond to complainant - Identify Non Conformances and notify Waste Manager - Review and update the Noise Management Plan as required
Council Personnel / Contractor	<ul style="list-style-type: none"> - Undertake monitoring required by the NMP - Communication with EPA, as required

4.1 Qualifications and Training

Measurements and reporting required by this NMP are to be conducted by suitably qualified personnel and/or experienced acoustic consultant.

It is anticipated that Council personnel will be trained in the requirements of the NMP by a suitably qualified acoustic consultant. Training is to be completed prior to any Council personnel undertaking monitoring actions specified in this NMP. The training program is to include:

- Details and requirements of this NMP;
- Details of the monitoring equipment specifications and maintenance requirements of that equipment;
- Operation of the monitoring equipment, including a step-by-step procedure and provision of supporting training materials;
- Reporting requirements, including report format, frequency and verification;
- Data handling and storing of information; and
- Details of when acoustic consultants are to be engaged under this NMP (i.e. for verification).

Lists of suitable acoustic consultants can be obtained from the Association of Australian Acoustical Consultants (AAAC) and the Australian Acoustical Society (AAS).

5.0 Management Measures

5.1 Construction Noise Management

The following measures follow the Best Management Practice (BMP) and Best Available Technology Economically Achievable (BATEA), and are intended to mitigate noise impacts at nearby sensitive receivers. The NMP, including the following management measures, would be periodically reviewed and updated to include the latest BMP and BATEA.

These measures have also been incorporated into the Construction Environmental Management Plan (*ARLF-LEMP-RP-0002-CEMP*) that has been prepared for the landfill.

During construction, noise impacts should be generally managed through the following measures:

- Workers will be regularly trained to use equipment in ways to minimise noise;
- Equipment will be oriented away from sensitive receivers where possible;
- Loading and unloading will be carried out away from noise sensitive areas;
- Vehicles required on site will not 'queue' outside the worksite prior to the morning start time;
- All construction vehicles will enter and leave the site in accordance with site entry controls;
- Trucks on site will not be left standing with engines idling;
- Equipment including bulldozers, graders, excavators and trucks will have all reasonable and feasible noise controls fitted to reduce noise emissions;
- All equipment will be regularly inspected and maintained;
- The surrounding community will be notified via letter drops and/or local media announcements of any forthcoming unusual construction activities; and
- The community will be consulted prior to and throughout the construction phase.

5.2 Operational Noise Management

The following measures include the BMP and BATEA, and are intended to mitigate noise impacts at nearby sensitive receivers. The NMP, including the following management measures, would be periodically reviewed and updated to include the latest BMP and BATEA.

5.2.1 Noise Attenuation - Heavy Equipment

- Permanent heavy equipment to be used on site will be selected, where feasible and reasonable, with effective mufflers, enclosures and low-noise tool bits and blades. Equipment will have maximum sound power levels as presented in Table 5.

Table 5 Attenuated Equipment Sound Power Levels

Equipment Description	Sound Power Level dB(A)
Excavator	110 (105*)
Dozer (D5)	113 (108*)
Water Cart	105
Compactor (Landfill)	107 (102*)
Grader	114 (109*)
Tipper Truck	105
Truck	97
Scraper	114 (109*)

* 5 dB(A) reduction applied for silencing

- Equipment purchased or leased for use at the landfill will be selected based on consideration of the maximum sound power levels presented in Table 5.
- All equipment will be regularly inspected and maintained in good working order. The condition of mufflers will also be checked;
- Equipment will not be operated until it is maintained or repaired, where maintenance or repair would address any annoying characters of noise identified; and
- Equipment will be turned off when not being used.

5.2.2 Noise Attenuation - Reversing Alarms

- The use of reversing alarms will be avoided by designing the site layout to minimise reversing, such as by including drive-through routes.
- Where feasible and reasonable less annoying alternatives to the typical ‘beeper’ alarms will be installed, taking into account the requirements of Workplace Health and Safety legislation; examples are smart alarms that adjust their volume depending on the ambient level of noise and multi-frequency alarms that emit noise over a wide range of frequencies.

5.2.3 Fixed Equipment

- Council will ensure that any items of fixed equipment, for example generators and pumps are, wherever possible, housed in suitably sound proofed enclosures and that if these items of equipment are operated on a pre-programmed schedule then that schedule, if possible, will provide for operation during working hours.

5.2.4 Staging Plan

- The landfill is being filled from the south to the north (Cell 1 to Cell 5). Consideration will also be given to filling each cell from the west to the east which will maximise the amount of shielding provided to the closest receiver to the west of the landfill (Strathaven).

5.2.5 Location of Stockpiles

- As far as practical, cover material will be generally be stockpiled along the south of the active landfill cell in order to provide additional shielding.

5.2.6 Mobile Noise Barriers

- If noise monitoring identifies exceedances of the relevant noise limits during covering works for Cell 1 then a mobile noise barrier will be provided along the southern boundary. The mobile noise barrier will be of suitable attenuation specifications to mitigate the identified exceedance.

6.0 Monitoring Program

As required by Condition 18 (e) of the Project Approval, Council will implement a program for monitoring the noise impacts of the project. Attended and unattended real time noise monitoring will be undertaken to measure noise emissions during operation. The following section outlines the proposed monitoring program for the landfill.

6.1 Noise Monitoring Locations

Real time noise monitors will be installed within the landfill site boundary and will trigger an alarm system to notify the Site Environmental Officer (Superintendent or Superintendent's Representative) when the project noise limits are exceeded.

The noise monitors will be located within the landfill site, on the southern and western boundaries, closest to the two nearest receivers. The location of the noise monitoring stations is shown in Figure 3.

6.2 Monitoring approach

6.2.1 Construction attended noise monitoring

Attended noise measurements will be undertaken at the commencement of construction and quarterly during the construction phase of Cell 1 (or as required to respond to complaints or noisy events). Attended measurements will be made at the real time noise monitoring locations and also at nearby sensitive receiver locations.

6.2.2 Operational unattended real time noise monitoring

Noise levels during operation will be monitored on site and compared with the noise limits set for the project (refer to Section 2.1.1) to determine criteria exceedances at the nearby noise sensitive receivers (refer Table 6).

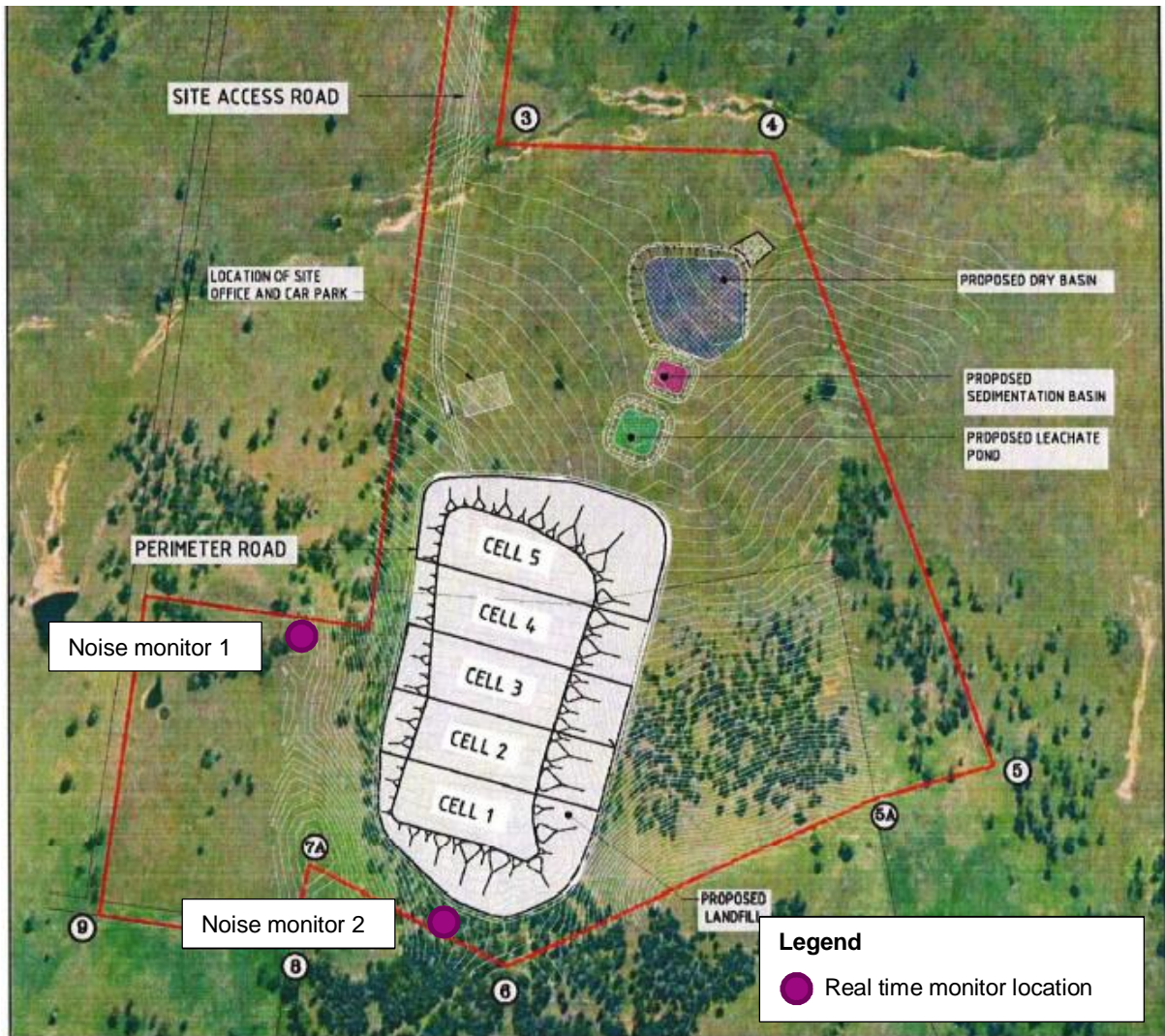


Figure 3 Unattended noise monitoring locations

Noise levels at monitoring locations

Compliance with the noise limits at the sensitive receivers will require the maximum L_{Aeq} noise levels in Table 6 to be achieved at the monitoring locations.

Table 6 L_{Aeq} noise levels at unattended noise monitoring locations

Cell in operation	L_{Aeq} noise level at unattended monitoring location, dB(A)	
	Location 1	Location 2
Cell 1	48	42
Cell 2	52	38
Cell 3	59	42
Cell 4	58	40
Cell 5	48	39

6.2.3 Operational attended noise monitoring

Attended measurements will also be undertaken on a biannual basis during the operational phase. The attended monitoring will be used to confirm the noise monitoring approach is accurate and reliable and that noise management measures are effective. If it is determined that operation is showing trends of compliance then yearly attended monitoring would be undertaken (or as otherwise specified by the EPA). Attended measurements will be made at the unattended real time noise monitoring locations and also at nearby sensitive receiver locations.

6.3 Monitoring procedure

The measurements will be conducted in accordance with the procedures outlined in Australian Standard AS 1055 *Acoustics – Description and measurement of environmental noise* and in accordance with methods outlined in the NSW INP. The following points will be followed when conducting noise monitoring:

- A field calibration should be conducted before and after measurements;
- The sound level meters must be set to an A-weighting and Fast;
- The sound level meters sample period should be set to 15 minutes;
- The following descriptors should be measured as a minimum: L_{A1} , L_{Aeq} and L_{A90} ; and
- Measurements should be conducted a minimum of 3 metres from the nearest façade and/or solid fence/wall. If it is not possible to do this, corrections for façade reflection should be applied to the measurement results.

6.4 Monitoring of equipment procedure

In addition to the noise monitoring procedure described above, the following equipment measurements will be undertaken:

- Noise emission levels of all critical items of mobile plant and equipment will be checked for compliance by the Environmental Officer for compliance with noise limits appropriate to those items prior to the equipment going into regular service;
- The levels to be monitored will include the L_{Amax} and L_{Aeq} levels;
- For equipment and mobile plant used for construction works, measurements will be taken at an appropriate distance, normally 7m and converted to a Sound Power Level;
- An *Equipment Noise Certificate*, presenting relevant sound levels of the equipment tested, will be issued by the Site Environmental Officer (Superintendent or Superintendent's Representative) within the first week of the equipment commencing at the construction site; and
- The equipment sound power levels will be compared to the levels contained in Table 5. Where they exceed these levels, noise emissions from the site will be recalculated and confirmation that the landfill noise goals can still be met will be provided where appropriate. If noise checks on any equipment result in a prediction of non-compliance, noise mitigation strategies to achieve compliance will be developed and implemented as outlined in Section 5.0.

6.5 Personnel

Monitoring measurements and reporting are to be conducted by a suitably qualified and experienced acoustic consultant, or personnel trained in the required tasks as described in Section 5.1 of this NMP.

6.6 Equipment

All acoustic instrumentation employed throughout the monitoring programme will comply with the requirements of AS IEC 61672.1-2004 *Electroacoustics - Sound level meters – Specifications*. All sound level meters must have current calibration certificate from a NATA accredited laboratory in accordance with NATA guidelines. Instrument calibration shall be checked before and after each measurement survey, with the variation in calibrated levels not exceeding ± 0.5 dB.

6.7 Weather monitoring

6.7.1 Weather monitoring instrumentation

All noise measurements shall be accompanied by a quantitative measurement of prevailing local weather conditions throughout the survey period. A weather station will be installed on site to allow monitoring of all relevant parameters such as wind speed and wind direction data, rainfall, temperature, humidity and barometric pressure.

6.7.2 Monitoring conditions

All attended and equipment check monitoring would be conducted under suitable conditions. Such conditions include wind less than 5m/s, no rain and minimal extraneous noise.

6.8 Monitoring and reporting schedule

6.8.1 Construction monitoring schedule

Table 7 provides a preliminary noise monitoring schedule for the construction stage.

Table 7 Construction noise monitoring schedule

Schedule	Action
At commencement of construction (i.e. during first month of construction)	Complete one round of operator-attended 15 minute noise monitoring on separate days at site boundaries and closest residences
	Carry out equipment noise level checks on all critical items of plant and issue Equipment Noise Certificates
At the commencement of heavy earthmoving operations	Complete one round of operator-attended noise monitoring at site boundaries, unattended monitoring locations and closest residences
During subsequent months of construction period	Carry out equipment noise level checks on any new (untested) items of critical plant and issue Equipment Noise Certificates

6.8.2 Operational noise monitoring schedule

Table 8 provides a preliminary monitoring schedule for operation.

Table 8 Operational noise monitoring schedule

Schedule	Action
During first month of operation	Set up unattended noise monitors and check that data download is operational
	Complete one round of operator-attended noise monitoring at unattended monitoring locations and closest residences
	Carry out equipment noise level checks on all critical items of plant and issue Equipment Noise Certificates
During subsequent months of operations	Carry out equipment noise level checks on any new (untested) items of critical plant and issue Equipment Noise Certificates
During the first year of operation	Unattended real time monitoring data will be downloaded on a weekly basis and summarised into quarterly reports
	Complete two rounds of operator-attended 15 minute noise monitoring at unattended monitoring locations and closest residences
Operation (from the second year onwards)	Download unattended real time monitoring data on a weekly basis and summarised into quarterly reports
	Complete one round of operator-attended 15 minute noise monitoring at unattended monitoring locations and closest residences at designated intervals. Intervals are to be: <ul style="list-style-type: none"> - not less than annually; - if downloaded data shows noise levels close to or in exceedance of those specified; or - on receipt of a noise exceedance complaint.

6.9 Reporting

6.9.1 Reporting details

The following information must be included in the quarterly reports:

- Field calibration results (before and after measurements);
- Measurement times and dates;
- Qualitative description of the noise environment during the measurements;
- L_{A1} , L_{Aeq} and L_{A90} levels;
- Meteorological conditions during the measurements; and
- Estimation of or recorded noise contribution from other major noise sources.

6.9.2 Record keeping

Council will establish and maintain a system of records which provides full documentation of all noise monitoring results, complaint handling and responses to non-compliances. Council shall establish and maintain procedures for the collection, indexing, filing, storage and maintenance of the records. Archived records shall be kept in accordance with Council's document control procedure.

6.10 Non-compliance and remedial measures

In the event that noise monitoring identifies noise levels above the noise limits the following process is to be implemented by the Waste Manager (or delegate):

- 1) Stop work.
- 2) Identify the source/reason for exceedance of the criteria.
- 3) Consult with potentially affected sensitive receivers, where appropriate.
- 4) Outline alternative work methodologies or equipment to mitigate the exceedance OR;
Provide temporary noise barriers (of suitable attenuation) specifications between the works area and the affected receiver until noisy activities are completed.
- 5) Within 7 days of the date of the incident, Waste Manager shall provide the Secretary and any relevant agencies with a detailed report on the incident, and such further reports as may be requested.

6.11 Noise easement

Condition 17/Schedule 4 requires that prior to the operation of the facility, a noise-easement must be registered on the title of the residual lot containing the dwelling on the farm 'Sherraloy' allowing the noise limit criteria as specified in Condition 16 (38 dB(A) during operation of Cell 1 only). This easement has been registered on the title and monitoring for impacts to 'Sherraloy' is to be undertaken as specified by this NMP.

7.0 Complaints handling procedure and community consultation

The procedure for the handling of complaints relating to the construction and operation of the landfill are detailed in the LEMP. The complaints handling procedure is to be followed for all complaints made regarding offsite impacts arising from the construction and operation of the landfill (ARLF-LEMP-RP-0001).

In terms of complaints relating to noise, the Site Environmental Officer / Superintendent will record the following information:

- Details of any complaints regarding noise, including the complainant's name, address and contact number.
- A summary of the complaint: complainant location, time of day, notes regarding the event, notes regarding the duration (seconds, minutes, etc.) of the period when the noise was perceived.
- Details of the response to complaints (including supplementary monitoring, corrective action, etc.).
- A log of all factors related to the event, i.e. time of the complaint, duration of the event in question, frequency of the event if occurring on multiple occasions, landfilling operation details, weather conditions and any extenuating circumstances.

The Site Environmental Officer / Superintendent will record details of all complaints received and will maintain an up-to-date log-book. The Site Environmental Officer / Superintendent will provide a response to the complainant within 24 hours and record the response in the log book. The corrective action may involve supplementary monitoring to identify the source of the non-conformance, and/or the modification of construction or operational techniques to avoid any recurrence or minimise its adverse effects. Complaints received in relation to noise will be updated onto the landfill complaints register on a monthly basis.

The Site Environmental Officer / Superintendent will make available a report on complaints received to the community, Council and relevant government agencies upon request. A summary will be included in the *Annual Report*.

8.0 Review and continual improvement

Within three months of a report submission to the Secretary, including the annual report, incident report and independent environmental audit, this NMP shall be reviewed, and if necessary revised to the satisfaction of the Secretary.

The review should assess all relevant information including:

- Historical analytical data
- Changes in land use
- Incidents related to noise emission exceedance.

The NMP would need to be modified to reflect any variation in sampling frequency, addition of new sampling locations or variation in the analytical regime, for example, from a new noise issue being identified on site.

The NMP should be viewed as a live document and updated as necessary, noting that revision of the NMP may result in the monitoring regime increasing or decreasing.

9.0 References

AECOM (2010), *Armidale Regional Landfill Noise Impact Assessment*

NSW Environment Protection Authority (EPA) - *Industrial Noise Policy (INP)*, January 2000 and relevant application notes, 2006

NSW Environment Protection Authority (EPA) – *Environmental Criteria for Road Traffic Noise (ECRTN)*, May 1999

NSW Department of Environment and Climate Change (DECC) – *Interim Construction Noise Guidelines (ICNG)*, July 2009

Standards Australia AS1055-1997™ (AS1055) - *Description and Measurement of Environmental Noise*, Parts 1, 2 and 3

Standards Australia AS IEC 61672.1-2004™ (AS61672) - *Electro Acoustics - Sound Level Meters Specifications*

Standards Australia AS 2436-2010™ (AS2436) - *Guide To Noise And Vibration Control On Construction, Demolition And Maintenance Sites*

International Organisation for Standardisation (ISO) 9613-2:1996 (ISO9613:2) - *Acoustics - Attenuation Of Sound During Propagation Outdoors - Part 2: General Method Of Calculation*

Appendix A

Consultation with EPA on NMP

Frolich, Alexandra

From: Lindsay Fulloon <Lindsay.Fulloon@epa.nsw.gov.au>
Sent: Wednesday, 3 June 2015 8:58 AM
To: Frolich, Alexandra
Cc: Price, Duncan; Michael Lewis; Simon Smith; Kharl Turnbull
Subject: RE: Armidale Regional Landfill - Noise Management Plan - for EPA

Hi Alexandra

EPA policy is that it will not endorse site management plans required by project approval conditions. However I can confirm that EPA have reviewed the NMP and that it will not be making further comment.

Please don't hesitate to call me if you wish to discuss.

Kind regards

Lindsay

Lindsay Fulloon | Senior Regional Operations Officer | Environment Protection Authority
Tel (02) 6773 7000 | Mob 0419 418 577 | Fax (02) 6772 2336
lindsay.fulloon@epa.nsw.gov.au

From: Frolich, Alexandra [<mailto:Alexandra.Frolich@aecom.com>]
Sent: Friday, 22 May 2015 3:28 PM
To: EPA RSD Armidale Mailbox
Cc: Price, Duncan
Subject: Armidale Regional Landfill - Noise Management Plan - for EPA

Hi,

AECOM, on behalf of Armidale Dumaresq Council, wish to consult with the EPA on the attached Noise Management Plan (NMP) for the Armidale Regional Landfill. The NMP satisfies Condition 18 of Schedule 4 of the landfills project approval (PA 06_0220). We would appreciate any feedback or comment by 5th June 2015.

We would be pleased to further discuss any queries in relation to this NMP with the appropriate EPA officer.

Kind regards,

Alex Frolich
Senior Scientist
D +61 2 8934 0273
Alexandra.Frolich@aecom.com

AECOM
Level 21, 420 George Street, Sydney, NSW 2000
Q410, QVB Post Office, Sydney, NSW, 1230
T +61 2 8934 0000 F +61 2 8934 0001
www.aecom.com

Please consider the environment before printing this email.

This e-mail and any attachments contain AECOM confidential information that may be proprietary or privileged. If you receive this message in error or are not the intended recipient, you should not retain, distribute, disclose or use any of this information and you should destroy the e-mail and any attachments or copies.

This email is intended for the addressee(s) named and may contain confidential and/or privileged information.

If you are not the intended recipient, please notify the sender and then delete it immediately. Any views expressed in this email are those of the individual sender except where the sender expressly and with authority states them to be the views of the Environment Protection Authority.

PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING THIS EMAIL