Noise Monitoring Management Plan

For
Woodlawn Bioreactor

Document Code: PLA-NSW-XXX-XXX-1

Date: 24.07.2018

Veolia Australia and New Zealand
NSW Resource Recovery – Woodlawn Bioreactor
619 Collector Road
Tarago NSW 2580
www.veolia.com.au

Tel: 02 8588 1360

Quality Information

Document Revision Register

Rev	Revision Details	Prepared by	Review By	Authorised By	Date
1	Initial draft for internal review	Amandeep Brar NSW Environmental Planner	Ramona Bachu NSW Environment Officer		30 March 2016
2	Final draft for submission to DPE	Amandeep Brar NSW Environmental Planner	Ramona Bachu NSW Environment Officer	Henry Gundry Woodlawn Facilities Manager	14 April 2016
3	Final for submission to DPE	Harneet Puarr Woodlawn Environmental Officer	Amandeep Brar Environmental Planner		24 April 2018

Contents

Definitions/Abbreviations

COC	Conditions of Development Consent
DA	Development Application
DECCW	Department of Environment Climate Change and Water
DPE	Department of Planning and Environment
EA	Environmental Assessment
ECRTN	Environmental Criteria for Road Traffic Noise
EMP	Environment Management Plan
ENCM	Environmental Noise Control Manual
EP&A	Environmental Planning and Assessment (Act and Regulations)
EPA	NSW Environment Protection Authority
EPL	Environment Protection Licence
ERP	Emergency Response Plan
GHG	Greenhouse Gas Emissions
INP	Industrial Noise Policy (EPA 2000)
NMMP	Noise Monitoring and Management Plan
LEMP	Landfill Environmental Management Plan
LTP	Leachate Treatment Plant
POEO	Protection of the Environment Operations (Act and Regulations)
RIVO	Incident and Compliance Management System
SMP	Site Management Plan
TPA	Tonnes per annum
Veolia	Veolia Australia and New Zealand
WHS	Work Health and Safety (Act and Regulation)
LA1	The noise level exceeded for 1% of the 15-minute interval.

LA10	The noise level exceeded for 10% of the 15-minute interval. This is commonly referred to as the average maximum noise level.
LA90	The LA90 level is the noise level, which is exceeded for 90% of the sample period. During the sample period, the noise level is below the LA90 level for 10% of the time. This measure is commonly referred to as the background noise level.
LAeq	The equivalent continuous sound level (LAeq) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise, which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.
LAeq (1hr)	The LAeq noise level for a one-hour period.
LAeq (15 hr)	The LAeq noise level for the period 7am to 10pm.
LAeq (9 hr)	The LAeq noise level for the period 10pm to 7am.
Leq	The equivalent continuous sound level in dB(A); that is, the constant sound level which has the same acoustic energy as the original fluctuating noise for the same period of time.

SECTION 1 Introduction

1.1 Overview

Veolia Australia and New Zealand (Veolia) own and operate the Woodlawn Eco Project Site (the Eco Project Site), which is located in the Southern Tablelands of NSW, approximately 250 kilometres (km) South West of Sydney.

The Eco Project Site consists of two properties on approximately 6,000 hectares (ha) of land, namely Woodlawn and Pylara and includes the area of the Special (Crown & Private Lands) Lease 20 (SML 20), encompassing the Woodlawn Mine, a former lead, copper and zinc mine which ceased mining operations in 1998. The first stage of the Eco Project Site developed by Veolia was the Woodlawn Bioreactor (the Bioreactor), which commenced operations in September 2004 and is located in the void of the former Woodlawn Mine.

The Bioreactor has considerable capacity to receive putrescible waste generated from both Sydney and surrounding areas of regional NSW. On the basis of this, a modification application was sought by Veolia to remove the arbitrary annual waste input limits into the Bioreactor, and in response to the Wright Corporate Strategies' Public Review – Landfill Capacity and Demand (the Wright Review, 2009). The Wright Review was an independent review commissioned by the Minister for Planning to examine critical issues such as the continuing need for putrescible waste landfill capacity, regional disposal capacity and demand.

On 16 March 2012, the Department of Planning and Environment (DPE) granted approval for the Bioreactor to increase its annual maximum input rate from 500,000 tonnes per annum (tpa) to 1,130,000 tpa, referred to hereon as the expanded operations.

On 9 September 2016, DPE approved the long-term leachate management strategy (LTLM Strategy) for improving the extraction and treatment of leachate from the waste mass by installing a new membrane bioreactor (MBR) treatment plant to treat leachate at a faster rate and produce a much higher quality effluent.

Modification of the PA 10_0012 MOD 2 & DA 31-02-99 MOD 3 for the construction and operations of the long–term leachate management strategy including the Leachate Treatment Plant was approved by DPE on 22 December 2017.

This Noise Monitoring and Management Plan (NMMP) has been prepared in accordance with the regulatory requirements to manage noise emissions associated with the operation of the Bioreactor as a result of the expanded operations. The NMMP forms the management tool, as part of the Woodlawn Bioreactor Landfill Environmental Management Plan (LEMP), for adapting environmental noise goals for the Bioreactor and provides guidance for noise mitigation measures and monitoring compliance against the goals.

1.2 Scope and Objectives

The objectives of the NNMP are to ensure that any noise emissions from the Bioreactor with the potential to impact on nearby sensitive receivers are within the criteria specified in the Conditions of Consent (the Conditions).

The NMMP covers potential noise emissions attributable to the Bioreactor, as a result of the expanded operations, which includes:

- Noise associated with waste vehicle movements transporting waste to the Bioreactor; and
- Noise associated with the operation of fixed/mobile plant and other mechanical equipment at the Bioreactor.

The NMMP provides the strategic framework for ensuring obligations; objectives and targets relating to noise are met by:

- Adapting environmental noise goals for the Bioreactor;
- Detailing guidance for noise mitigation measures; and
- Specifying monitoring requirements for compliance against the goals.

The key goals of this NMP are to:

- Facilitate compliance with the relevant State legislations, regulations and approvals.
- Provide a framework for noise management at the Bioreactor to:
- Minimise the noise emissions from the Bioreactor assets and activities.
- Engage stakeholders including local communities in assisting the Bioreactor in the identification and the management of the noise emissions.
- Identify, monitor and prioritise the management of the noise emissions present on the Bioreactor assets and activities and
- Minimise nuisance noise emissions to sensitive receptors.

The NMMP is a working document, and the management strategies outlined are intended for review periodically.

1.3 Legal and Other Requirements

The following regulatory framework applies to this NMMP:

- Project Approval – Woodlawn Expansion Project (10-0012) issued under the Environmental Planning and Assessment Act 1979 (PA)
- Environment Protection Licence 11436 issued under the Protection of the Environment Operations (POEO) Act 1997 and particularly conditions from the POEO (Clean Air) Regulation 2010 (EPL)
- Development Consent (DA-31-02-99) issued under the Environmental Planning and Assessment Act 1979 (DA)

1.3.1 Project Approval 10-0012

The relevant conditions of consent (COC) from the PA are provided in Table 1.1

Table 1.1- PA Conditions

Relevant COC	Requirement	NMMP Reference
Sch 4 Cond 19	The Proponent shall ensure that the noise generated by the operations on-site does not exceed the limits in Table 6 at any	Section 2.1

<table>
<tr><td></td><td>private residential receiver.

<table><tr><th>Receiver</th><th>6am – 10pm</th><th colspan="2">10pm – 6am</th></tr><tr><td rowspan="2">Any private residential receiver</td><td>LAeq(15 minute)</td><td>LAeq(15 minute)</td><td>LAmax</td></tr><tr><td>35</td><td>35</td><td>45</td></tr></table>Table 6</td><td></td></tr>
<tr><td>Sch 4
Cond 20</td><td>Operating Hours
The Proponent shall comply with the operating hours in Table 7 for the site, unless otherwise agreed in writing by the OEH.
Table 7<table><tr><th>Activity</th><th>Day</th><th>Hours</th></tr><tr><td rowspan="2">Operations</td><td>Monday-Saturday</td><td>6 am-10 pm</td></tr><tr><td>Sunday & Public Holidays</td><td>Nil</td></tr></table></td><td>Section 3.1</td></tr>
<tr><td>Sch 4
Cond 21</td><td>Monitoring and Management
The Proponent shall prepare and implement a Noise Monitoring and Management Plan for the Landfill to the satisfaction of the Director-General. This plan must:
(a) be prepared in consultation with OEH by a suitably qualified and experienced expert whose appointment has been endorsed by the Director-General;
(b) be approved by the Director-General prior to the commencement of expanded operations;

(c) include a noise monitoring protocol for evaluating compliance with the noise impact assessment criteria in this approval;

(d) details all reasonable and feasible measures to minimise noise at the site;

(e) consider road traffic noise management and include a revised road traffic noise protocol;
(f) describe mitigation measures that would be implemented in the event that non-compliance is identified with the noise impact assessment criteria in this approval.

This plan must be documented in the Landfill EMP (see condition 3 in schedule 7).</td><td>Noted

Noted

Section 5.1

Section 4.1

Section 4.1 & Appendix C

Section 5.3

Noted</td></tr>
</table>

1.3.2 Veolia's Statement of Commitments

The relevant statement of commitments for noise management made by Veolia and incorporated into the PA consent are detailed in Table 1.2 below

Table 1.2 – PA Statement of Commitments

Mitigation Measure	NMMP Reference
Hours of operations for the Bioreactor are 6am to 10pm, Monday to Saturday and no work on Sundays, Good Fridays or Christmas Day. Hours of operations may be varied with the written approval of DECCW	Section 3.1

1.3.3 Development Consent (DA-31-02-99)

Relevant COC	Requirement	NMMP Reference
99	Noise from premises must not exceed an LA10(15 minute) noise emission criterion of 35dBA LA10(15 minute) at the most affected residential receiver. (EPA GTA) Note: Noise Measurement For the purpose of noise measures required for this condition, the LA10 noise level must be measured or computed at the most affected residential receiver 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 tonal or impulsive in character. Measurement locations are: • 1 metre from the facade of the residence for night-time (10.00pm to 7.00am) assessment; • at the residential boundary or 30 metres from the residence (rural situations) where boundary is more than 30 metres from residence for day time (7.00am to 10.00pm) assessment. For the purpose of noise, measurements required for this condition the noise emission limits identified apply for prevailing meteorological conditions, winds up to 3m/s.	Superseded by PA (Sch 4, Cond 19)
100.	The noise emission limits identified in Condition 99 apply for prevailing meteorological conditions, 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 patterns of temperature inversions or increased level of impacts from temperature inversions; b) Where levels of noise complaints indicate a higher level of impact then actions to quantify and ameliorate any enhanced impacts under conditions of temperature inversions should be developed and implemented. (EPA GTA)	Superseded by PA (Sch 4, Cond 21)

1.3.4 Environment Protection Licence

EPL 11436 stipulates the environmental obligations for Veolia under the POEO Act. The relevant conditions to the NMMP are provided in Table 1.4.

Table 1.3 – EPL Conditions

Relevant Condition	Requirement	NMMP Reference
L4 L 4.1	**Noise limits** Noise from the premises must not exceed 35 dB(A) LAeq (15 minute) at the most affected residential receiver. Where LAeq means the equivalent continuous noise level – the level of noise equivalent to the energy-average of noise levels occurring over a measurement period.	Section 2.1
L 4.2	**For the purpose of Condition L4.1:** a) The LAeq noise level must be measured or computed at the most affected residential receiver over a period of 15 minutes using "FAST" response on the sound level meter. b) 5dB(A) must be added to the measured level if the noise is substantially tonal or impulsive in character. c) Measurement locations are: i) for night time (10 pm to 7 am) assessment - 1 metre from the façade of the residence; and ii) for day time (7 am to 10 pm) assessment – at the residential boundary or 30 metres from the residence where the boundary is more than 30 metres from the residence. d) The noise emission limits apply for prevailing meteorological and winds up to 3 metres per second, except under conditions of temperature inversions.	Noted
L 4.3	Where noise impacts are enhanced by temperature inversions, the licensee must identify any patterns of temperature inversions and the increased level of impacts, and develop and implement actions to quantify and ameliorate any enhanced impacts.	Noted

1.4 Stakeholder Consultation

Veolia is committed to meaningful stakeholder engagement and has worked in collaboration with relevant government agencies and the local community in the township of Tarago since the commencement of operations of the Bioreactor to resolve issues that impact local environmental amenity, as a result of operations at the Bioreactor.

1.4.1 Government Agencies

Veolia continues to liaise with the following government agencies in relation to air quality associated with the operations of the Bioreactor:

- NSW Environment Protection Authority;

1.4.2 Community Consultation

Veolia has formed a Community Liaison Committee (CLC), which acts as an interface between the residents of Tarago and Veolia to proactively resolve issues that impact on local amenity potentially from operations at the Bioreactor.

The key objectives of the community focused communication and consultation program include:

- Educating stakeholders regarding key aspects of the Bioreactor; and
- Informing community groups and neighbours to help Veolia understand concerns.

Community consultation activities include:

- A dedicated Veolia webpage, offering general information on the Bioreactor;
- A community telephone line to provide a central point of contact for community enquiries;
- Proving regular updates in the local newspaper, Tarago Times, which is non-profit community service, published monthly by the Tarago Sporting Association Inc. It is distributed throughout Tarago, Lake Bathurst, Mayfield, Boro, Taylors Creek and the surrounding district.
- Active participation in the Tarago Progress Association Inc (TADPAI), which is a community group aimed at promoting the district and assisting the community in the development and maintenance of a rural lifestyle.

SECTION 2 Goals of NMMP

The goal of the NMMP is to document the strategies for identifying, monitoring and mitigating noise emissions from the Bioreactor with potential to impact the closest sensitive receivers. Those identified in the EA were:

- Cowley Hills (owned by Veolia)
- Woodlawn Farm (owned by Veolia)
- Chinnery

2.1 Noise Goals

The Bioreactor assets and activities in the Woodlawn generate various noise sources from the permanent installations and the ancillary operations. Noise emissions from these activities have the potential to impact upon environmental and social values.

A noise assessment for the expanded operations was undertaken in accordance with the following guidelines:

- Australian Standard AS 1055:1997 Description and Measurement of Environmental Noise Parts 1, 2 and 3;
- EPA NSW Industrial Noise Policy (INP);
- NSW Environmental Noise Control Manual (ENCM); and
- Environmental Criteria for Road Traffic Noise (ECRTN) for traffic related noise impacts.

A computer model was used to predict noise emissions from the Bioreactor expanded operations. The operational noise modelling was undertaken using Sound PLAN v6.4 software. A three-dimensional digital terrain map giving all relevant topographic information was used in the modelling process. The model used this map, together with noise source data, ground cover, shielding by barriers and/or adjacent buildings and atmospheric information to predict noise levels at the nearest potentially affected receivers.

Prediction of noise emission levels was carried out under calm and prevailing atmospheric conditions.

Based on this modelling, the following noise goals were adopted for the Bioreactor (refer Table 2.1)

Table 2.1 Noise Goal (D(b)A)

Receiver	**6am – 10pm**	**10pm – 6am**	
Any private residential receiver	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	L_{Amax}
24-hour	35	35	45

Based on the EA, the noise impacts associated with the Bioreactor expanded operations are anticipated to be within the adopted noise goals.

2.2 Roles and Responsibilities

Table 2.1 outlines the responsibilities of Veolia personnel with respect to noise

monitoring management

Table 2.1 – NMMP Responsibilities

Action	Responsibility
Overall implementation of the NMMP	Woodlawn Facility Manager and Operational Personnel
Implement methodology for avoiding excessive noise emissions	Woodlawn Facility Manager and Operational Personnel
Coordinate monitoring and compile reports	NSW Technical and Engineering Team
Maintain internal records of monitoring	NSW Technical and Engineering Team
Collate and maintain records of complaints, respond to complainant	Woodlawn Facility Manager and/or nominee
Identify non-conformances and notify Facility Manager/ Safety Health Environment Quality (SHEQ) Representative	Operational Personnel
Authorise and confirm the implementation of mitigation measures	Woodlawn Facility Manager/SHEQ Representative

SECTION 3 Existing Environment and Operational Impacts

3.1 Existing Environment

The Bioreactor is sited in a rural setting with ambient noise attributable to onsite plant and equipment, farm activity, passing vehicles on the adjacent roadways, wind, birds and insects.

The Operating Hours of the facility are as outlined in the Table 3-1

Table 3-1- Woodlawn Operating Hours

Activity	Day	Hours
Operations	Monday – Saturday	6 am – 10 pm
	Sunday, Good Friday & Christmas Day	Nil

3.1.1 Noise

The rural setting and undulating natural environment surrounding the Bioreactor provides a significant buffer distance for noise. The Bioreactor area comprises a portion of the 6,000 ha of land owned by Veolia with many of the nearest sensitive receptors being Veolia owned properties. Veolia owned properties include:

- Pylara;
- Cowley Hills; and
- The Woodlawn Farm

Since the commencement of operations, Veolia have not received any complaints related to activities or plant and equipment at the Bioreactor .No noise impacts have been raised at any community meetings. This indicates that noise is not a primary issue associated witl the Bioreactor and that current management measures are sufficient.

3.1.2 Wind

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

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

Weather data from an on-site weather station was used to determine prevailing weather conditions for the Bioreactor and analysed in accordance with procedures outlined in the INP. Seasonal wind records indicate that winds from 0.5 m/s to 3 m/s exceed the 30% threshold during the night from the east-north-east and nights and

were therefore considered a feature of the locality for the night-time period. Consequently, prevailing wind was considered as part of the noise assessment.

3.1.3 Temperature Inversion

Temperature inversions, when they occur, have the ability to increase noise levels by focusing sound waves. Temperature inversions occur predominantly at night during the winter months.

For a temperature, inversion to be a significant characteristic of the area it needs to occur for approximately 30% of the total night-time during winter, or about two nights per week.

Meteorological data was also analysed to determine the percentage occurrence of temperature inversions during winter nights at the Bioreactor. Temperature inversion during the night-time period was identified to exceed the 30% criterion and was considered as part of the noise assessment.

3.1.4 Sensitive Receivers

Table 3.1 shows the sensitive receivers where noise monitoring was undertaken as part of the expanded operations noise assessment.

Table 3.2 Residential Receivers

Location A	Cowley Hills (owned by Veolia)
Location B	Woodlawn Farm (owned by Veolia)
Location G	Chinnery

3.2 Predicted Noise Impacts

Historical ambient noise level measurements obtained from a background assessment conducted for the proposed Woodlawn Mechanical Treatment Facility were considered appropriate for incorporation into this assessment

A background monitoring survey, to characterise and quantify the acoustical environment in the area surrounding the Bioreactor, was undertaken at the residential locations shown in Table 3.1. This monitoring consisted of continuous, unattended noise logging and operator attended noise surveys. The operator-attended noise surveys assist with defining noise sources and the character of noise in the area and are, therefore, used to qualify unattended noise logging results.

These measurements were then used to develop noise goals for the expanded operations in accordance with the INP and ENCM, as presented in Section 2.

A comprehensive noise impact assessment for the expanded operations was undertaken. The existing noise levels within the Bioreactor area and surrounds were used to determine the noise impact criteria and predict noise levels expected to result from the expanded operations. The assessment identified that operational noise levels generated the Bioreactor would likely meet the relevant noise criteria at the nearest receivers.

A Qualitative assessment for the LTP, which considered the noise emissions from the blower at 1 metre from the source, against the noise levels in the approval, found that

the LTP would not generate excessive noise and would comfortably meet the established limits at sensitive receivers. In fact the assessment predicted that the leachate treatment plant would be inaudible at the nearest sensitive receptor.

3.2.1 Assessment Criteria

The EPA and local government authorities undertake regulation of noise emissions in NSW. The INP provides the two forms of noise criteria to set environmental noise objectives and the assessment of sleep disturbance and road traffic noise is based on the guidelines contained in the ENCM.

Intrusiveness

For assessing intrusiveness, which involves setting a noise goal relative to the existing acoustic environment, the background noise level must be measured. The intrusiveness criterion essentially means that the equivalent continuous noise level (L_{Aeq}) of the source should not be more than five decibels above the measured background level (L_{A90}).

Amenity

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

Table 3.3 Bioreactor Operational Project Specific Noise Criteria

Location	Locality (Noise Amenity Area)	Period	Intrusiveness Criteria $L_{Aeq(15minute)}$ (dBA)	Amenity Criteria LAeq(Period) (dBA)
A	Cowley Hills (owned by Veolia) (Rural)	Day	35	50
		Evening	35	45
		Night	35	40
B	Woodlawn Farm (owned by Veolia) (Rural)	Day	36	50
		Evening	35	45
		Night	35	40
G	Chinnery (Rural)	Day	35	50
		Evening	35	45
		Night	35	40

For Monday to Saturday, Daytime 7.00 am - 6.00pm; Evening 6.00pm - 10.00pm; Night-time 10.00pm - 7.00am.
On Sundays and Public Holidays, Daytime 8.00am - 6.00pm; Evening 6.00pm - 10.0 pm; Night-time 10.00 pm - 8.00am.

Sleep Disturbance

DECCW has acknowledged that the relationship between maximum noise levels and sleep disturbance is not currently well defined. Criteria for assessing sleep disturbance has not been identified under the INP and hence sleep arousal has been assessed using the guidelines set out in the ENCM Chapter 19-3.

To avoid the likelihood of sleep disturbance the ENCM recommends that the $L_{A1(1minute)}$ noise level of the source under consideration should not exceed the background noise level (L_{A90}) by more than 15 dBA when measured outside the bedroom window of the receiver during the night-time hours (10:00 pm to 7:00 am).

Table 3.4 – Sleep Disturbance Criteria

Location	Locality (Noise Amenity Area)	Period	Sleep Disturbance Criteria $L_{A1(1minute)}$ dBA
A	Cowley Hills (owned by Veolia) (Rural)	Night	45
B	Woodlawn Farm (owned by Veolia) (Rural)	Night	45
G	Chinnery (Rural)	Night	45

Road Traffic Noise

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

Table 3.5 – Road Traffic Noise Criteria

Type of Development	Criteria		Where Criteria are already exceeded
	Day 7am – 10pm	Night 10pm – 7am	
Land use developments with potential to create additional traffic on existing freeways/ arterials	60 dBA $L_{Aeq(15hour)}$	55 dBA $L_{Aeq(9hour)}$	Where feasible, existing noise levels should be mitigated to meet the noise criteria. Examples of applicable strategies include appropriate location of private access roads; regulating times of use; using clustering; using 'quiet' vehicles; and using barriers and acoustic treatments. In all cases, traffic arising from the development should not lead to an increase in existing noise levels of more than 2 dB.
Land use developments with potential to create additional traffic on existing collector roads	60 dBA $L_{Aeq(1hour)}$	55 dBA $L_{Aeq(1hour)}$	

The operational modelling scenario conducted for the Bioreactor accounted for all of the noise-generating plant and machinery anticipated to be at the site during different times of the day.

The operational noise impact of the Bioreactor was predicted to have minimal impact in meeting the adopted noise goals at all residential locations under calm weather

conditions. Under prevailing weather conditions, there may be exceedances of up to 2 dBA at two (2) residential locations. These properties - Cowley Hills and Woodlawn Farm - are both owned by Veolia.

The expanded operations are not predicted to impact noise levels in the morning shoulder period between 6:00 am and 7:00 am (night) as no activities will occur during this period and therefore not likely that sleep disturbance will occur.

Existing industrial noise contributions were determined from attended measurements at each of the monitoring locations. The existing industrial noise contribution was not discernable at the monitored locations.

3.2.2 Occupational Noise Survey

A survey was undertaken in Feb 2012 to identify the noise exposure for the employees of the Bioreactor. Noise surveys where taken on the operators of the container doors, booster 00, gas fieldwork and power station operator. This included the power station and a noise map produced (Appendix A).

The operators of the container doors are exposed to a noise level that is above the LAEQ, 8hr noise exposure of 85 dBA from the diesel engine that drives the hydraulic system. The diesel engine should be enclosed with noise reducing material so that the employees do not have to wear hearing protection when conducting this work. Whilst waiting for the engine to be encased in noise reducing material the employees working on the doors should wear hearing protection of a class one or two.

The power station requires hearing protection of a class five, SLC80 rating of 25-28 dB when entering the generator rooms as the maximum noise level is 110 dBA in these rooms. When working or entering the area of the vents and cooling towers employees should wear hearing protectors of class one-two. The noise map indicates the noise levels in each area of the power station.

The employees conducting work in the booster 00 area should wear hearing protection of class five, SLC80 rating of 25-28 dB as these employees are exposed to both impact noise of LCPEAK = 143 dBC and noise of LAEQ, 8HR = 92 dBA. Both of these level are above the recommended levels of LCPEAK = 140 dBC and LAEQ, 8HR = 85 dBA.

The employees should be trained on the use, fitting and storage of hearing protectors. If the employees wear earmuffs or ear plugs training should be undertaken of the correct fitting and wear times for hearing protection.

If a lower criteria such as LAEQ, 8HR = 80 dBA is used for determining the noise exposure of employees then a higher level of hearing protection is required. Lower criteria may be used when the company chooses to have a higher level of hearing protection for their employees.

Please refer to the Appendix B for the Detailed Occupational Survey Report

SECTION 4 Noise Management Measures

Mitigation measures that have been incorporated into the operations of the Bioreactor to minimise the risk and consequences associated with the key soil management issues identified are summarised below:

- Waste filling operations below the ground levels
- Road Transport – Code of Conduct
- Waste operations within the approved specified hours
- Acoustic enclosures
- Use of hearing protection in restricted areas

4.1 Noise Mitigation Measures

4.1.1 Waste filling operations below ground level

Undertaking waste filling practices within the Bioreactor confines much of the operational activities below ground. The use of natural barriers provided by the walls of the Bioreactor mitigates sound transmission to sensitive receptors.

Below ground waste filling will occur for a significant proportion of the life of the Bioreactor.

4.1.2 Road Transport Code of Conduct

Drivers are trained in a specific road transport code of conduct developed for Woodlawn. This provides drivers with an understanding of how to drive in a safe and efficient manner which minimises noise generated from vehicular movements. The Road transport Code of Conduct is provided in Appendix C.

4.1.3 Waste operations within the approved specified hours

Waste operations are undertaken within the operational hours specified., unless otherwise approved by the EPA. This process minimises noise emissions during night time when there is a higher probability of disturbance to sensitive receptors.

Operational activities are only undertaken outside these hours if approved by the EPA.

4.1.4 Acoustic enclosures

Acoustic enclosures are installed around equipment that may be hazardous to site personnel safety or cause environmental nuisance. The landfill gas engines are enclosed within acoustic enclosures to minimise noise during operation. Acoustic enclosures will be considered for new landfill gas engines and other equipment that may be a significant noise source. Acoustic enclosures are also considered where equipment, is operated continuously or during night time hours.

4.1.5 Use of hearing protection in restricted areas ic enclosures

Site personnel, visitors and contractors are required to wear suitable hearing protection when entering restricted areas, such as landfill gas engine rooms. Recommendations on the types and class of hearing protection is provided in the Occupational Survey Report (Appendix B).

SECTION 5 Noise Monitoring and Reporting

5.1 Monitoring Program

Regular noise monitoring is performed by the operation staff in accordance with the following table:

Action	Schedule
Carry out equipment noise level checks on any new (untested) items of critical plant and issue Equipment Noise Certificates.	As required
Carry out noise emission tests on waste delivery vehicles and on any new vehicles requiring access to the site.	As required
Community Consultation Meeting to discuss any noise related issues.	Quarterly
On a complaint basis, attended measurements and unattended Noise Logging as required	As required

5.2 Performance Reporting and Review

Where performance reporting is required, the EPL stipulates that all relevant data and information pertaining to environmental monitoring must be recorded and maintained on site, including but not limited to:

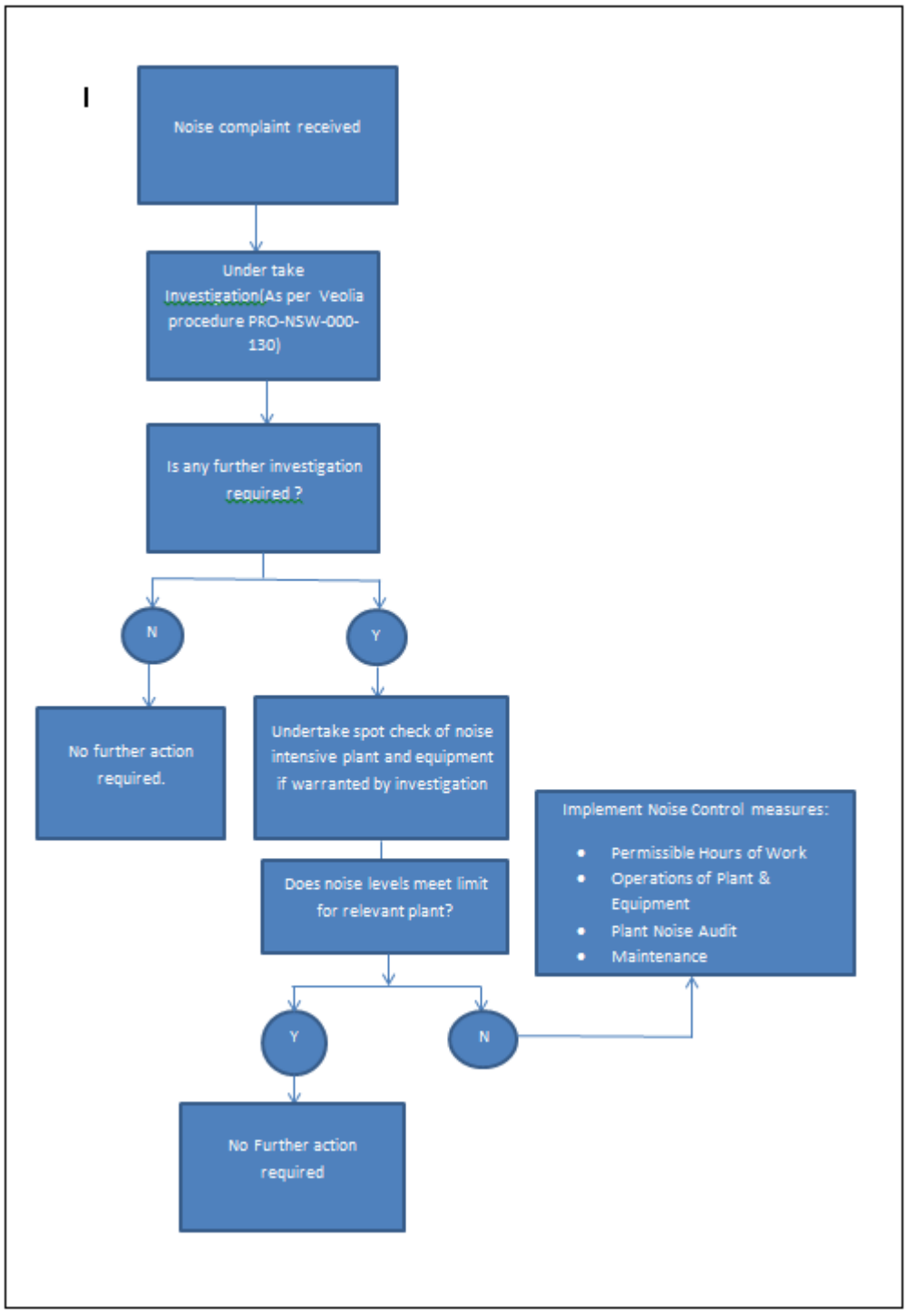
- Sampling dates, times and name of sampler;
- Chain of Custody, analysis and results;
- Complaints received and corrective actions taken; and
- Copy of the EPL, development consent and other relevant approvals.

The monitoring data will be used to review and identify any exceedances against the adapted goals with the appropriate corrective actions applied as discussed below.

5.3 Exceedances and Corrective Actions

Any noise emission incidents or complaints received will be managed and the appropriate corrective actions applied as outlined in the noise monitoring and management protocol in Figure 5.-1 and in accordance with the NSW Incident Investigation procedure (PRO-NSW-000-130)

Figure 5-1


Noise complaint received
Under take Investigation(As per Veolia procedure PRO-NSW-000-130)
Is any further investigation required ?
N
Y
No further action required.
Undertake spot check of noise intensive plant and equipment if warranted by investigation
Does noise levels meet limit for relevant plant?
Implement Noise Control measures:
Permissible Hours of Work
Operations of Plant & Equipment
Plant Noise Audit
Maintenance
Y
N
No Further action required

5.4 Publishing of Monitoring Data

Where required, Veolia publishes the results of any environmental monitoring required under the EPL on the following website:

http://www.veolia.com.au/sustainable-solutions/environmental-compliance/nsw-environmental-monitoring-data

References

1. *Noise Guide for Local Government 2013*
2. *Occupational Noise Survey Report 2012*
3. URS (2010). *Environmental Assessment Woodlawn Expansion Project*

Appendices

Appendix A – Power Station Noise Map

Appendix B – Occupational Survey Report

Appendix C – Road Transport Code of Conduct