REPORT

CAMDEN GAS PROJECT

NOISE MANAGEMENT SUB PLAN
RWDI # 2200822.29
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SUBMITTED TO

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NOTE

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DEFINITIONS

ABL – The Assessment Background Level is the single figure background level representing each assessment period (day, evening and night) for each day. It is determined by calculating the 10th percentile (lowest 10th percent) background level (LA90) for each period.

AGL – AGL Upstream Investments Pty Ltd

CGP – Camden Gas Project

DP&E – Department of Planning and Environment

EMP – Environmental Management Plan

EMS – Environmental Management System

ENCM – NSW Environmental Noise Control Manual (EPA Ref. 94/31)

EPA – Environment Protection Authority

EPL – Environment Protection Licence

Equivalent Continuous Sound Pressure Level (L_{Aeq}) – The equivalent continuous sound level (L_{Aeq}) 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.

L_{A90} – The L_{A90} level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the L_{A90} level for 10% of the time. This measure is commonly referred to as the background noise level.

Maximum Noise Level (L_{Amax}) – The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.

NGLG – Environmental Noise Management, Noise Guide for Local Government (EPA Ref.2004/59).

NMSP – Noise Management Sub Plan

NPfI – NSW Noise Policy for Industry, EPA, 2017

RBL – The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period, day, evening and night.

RNP – NSW Road Noise Policy, EPA, March 2011

RPGP – Rosalind Park Gas Plant

SLM (Sound Level Meter) – An instrument consisting of a microphone, amplifier and indicating device, having a declared performance and designed to measure sound pressure levels.

SPL (Sound Pressure Level) – The level of noise, expressed in decibels, as measured by a standard sound level meter with a microphone.

SWL (Sound Power Level) – Ten times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power.

RBL – The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period – daytime, evening and night time.

1 INTRODUCTION

This Noise Management Sub Plan (NMSP) has been prepared to supplement the Environment Management Plan (EMP) for the AGL Upstream Investments Pty Ltd (AGL) Camden Gas Project ('the project' or 'CGP').

The NMSP has been developed to specifically address and manage potential noise emissions for the decommissioning and rehabilitation of the CGP. It is based on the previously prepared and approved Noise Management Plans and Monitoring Programs, the Environment Health and Safety Management Plans, and the current AGL Energy Health, Safety and Environment Management System. More information on the structure of the Environmental Management System (EMS) for the project is available in the EMP.

The NMSP covers the decommissioning and rehabilitation of the Rosalind Park Gas Plant (RPGP), gas gathering lines and well sites which are considered 'construction' works for the purpose of this document.

1.1 Objectives & Targets

Objectives:

1. To comply with the construction noise goals.
2. To minimise noise.
3. Limit work activities to daylight hours between 7:00 am and 6:00 pm weekdays and between 8:00 am and 1:00 pm on Saturday. No work on Sundays or public holidays except in emergencies.
4. Best available practice noise management measures.

Targets:

1. Zero exceedances of noise criteria.
2. Zero non-conformances with work hours.
3. Zero complaints received from sensitive receivers.

2 REQUIREMENTS

2.1 Legislative Requirements and Guidelines

Legislation and Guidelines relating to the management of noise includes:

1. Protection of the Environment Operations Act 1997 (POEO Act);
2. Protection of the Environment Operations (General) Regulation 2022;
3. Protection of the Environment Operations (Noise Control) Regulation 2017;
4. NSW *Noise Policy for Industry (NPfI)*, NSW EPA, 2017;
5. *Interim Construction Noise Guideline (ICNG)*, NSW EPA, 2009;
6. *Approved Methods for the Measurement and Analysis of Environmental Noise in NSW*, NSW EPA, 2022;
7. NSW *Road Noise Policy (RNP)*, NSW EPA, 2011; and
8. *Noise Guide for Local Government (NGLG)*, NSW EPA, 2023.

The legislation is intended to limit transmission of "offensive noise" as defined in the POEO Act. Guidelines from the *NPfI*, *ICNG, RNP* and *NGLG* aid in assessment of noise and design of noise control procedures.

It is important to note that the construction noise guidelines used in the Development Consent Requirements have been superseded in July 2009 with the *Interim Construction Noise Guideline* which recommends different noise criteria. This may be taken into consideration when assessing construction noise associated with CGP.

2.2 Key Licence / Development Consent Requirements

There are a number of Development Consent Conditions and Environmental Protection Licence (EPL) Conditions that relate to noise. These range from preparing management plans, noise limits, noise monitoring and reporting requirements. A summary of the key requirements for Plans, Programs and Protocols is presented below (refer to the relevant Consent Conditions or Licences for further detail). The requirements are listed in **Table 2.1**.

This NMSP and its Appendices have been prepared to fulfil the requirements for a Construction and Operational Noise Management Plan, as well as requirements for Noise Monitoring Programs. Gas field and site-specific Noise Overviews have been prepared, where required, to supplement this Sub Plan with site-specific criteria, sensitive receivers, monitoring requirements and site-specific mitigation measures.

Table 2-1: Requirements

Name/ No.	Condition	Requirement
DA 15-1-2002-i Fields – RBTP, Apap, Joe Stanley, Johndilo, Loganbrae, Lipscombe, Mahon	CoC 19 (Sch 3)	Prepare and implement a Noise Management Plan. (Note: all wells under this Development Approval are fully decommissioned)

Name/ No.	Condition	Requirement
DA 246-8-2002i Field – Kay Park	CoC 18, 19 (Sch 3)	Implement management practices as necessary to mitigate noise from maintenance, redrilling and refracturing work. (Note: all wells under this Development Approval are fully decommissioned)
DA 282-6-2003-i Fields – RPGP, Rosalind Park, Wandinong, EMAI (EM01-20, 38-40), Glenlee (GL05, 07-10, 14-17)	CoC 34, 38 (Sch 4)	Prepare and implement a Construction and Well Maintenance Noise Management Protocol and an Operational Noise Management Plan.
DA 75-4-2005 Field – Sugarloaf	CoC 19, 20 (Sch 2)	Prepare and implement a Construction Noise Management Protocol and a Gathering System and Trunk Line Maintenance Protocol.
PA 06_0138 Field – EMAI (EM23-37)	CoC 3 & 6 (Sch 3)	Prepare and implement a Construction Noise Management Plan and Noise Monitoring Program. (Note: all wells under this Project Approval are fully decommissioned)
PA 06_0137 Field – Razorback	CoC 3 & 6 (Sch 3)	Prepare and implement a Construction Noise Management Plan and Noise Monitoring Program. (Note: all wells under this Project Approval are fully decommissioned)
PA 06_0291 Fields – Spring Farm, Menangle Park	CoC 3 & 7 (Sch 3)	Prepare and implement a Construction Noise Management Plan and Noise Monitoring Program.
Environment Protection Licence 12003	Condition L4	Undertake operations in accordance with the Well, Gathering System and Trunk Line Maintenance Noise Management Protocol.
Environment Protection Licence 12003 DA 282-6-2003-i	Condition R1.9 CoC 40 (Sch 4)	Submit annual noise compliance monitoring report for the RPGP with Annual Return.
AGL HSE Management System		Standard *AGL-HSE-STD-008.5 Noise Emissions* Standard Methodology *AGL-HSE-SDM-008.5 Noise Emissions*

3 NOISE SOURCES

AGL ceased operations at the CGP on 28 August 2023. Following the cessation of operations:

- all remaining gas wells have been shut in and are progressively being decommissioned and rehabilitated;
- the RPGP has been decommissioned and is under rehabilitation; and
- gas gathering lines have been isolated, purged and decommissioned. Some sections of the gas gathering line will be removed by earthmoving equipment.

Ten Development Consents and two EPLs have been issued for the CGP since 2002, with differing noise conditions and requirements which reflect the best practice of the day. Many of the requirements of the Consents and Licences relate specifically to construction activities, or have been completed, or have now expired.

AGL continues to adopt a best practice approach to noise management for the whole project to ensure that the same procedures are used across the various fields. This will streamline and simplify procedures and compliance management, and will not affect noise criteria for different areas in accordance with the *NPfI*.

The main noise impacts generated during the decommissioning and rehabilitation phase of the project include:

1. Decommissioning of wells; and
2. Earthmoving activities associated with well site rehabilitation, access road rehabilitation, RPGP rehabilitation, and gas gathering line removal and rehabilitation (where required.

3.1 Monitoring History

Through implementing the recommendations of numerous noise assessments and performing noise monitoring over the life of the project, AGL has been able to make improvements to reduce noise from construction activities and operations.

The approach established for recent construction activities at Spring Farm and Menangle Park is to move from a prescriptive approach to an individual site assessment to ensure compliance within the surrounding environment.

This is undertaken via a process of modelling the existing noise environment, designing the operations on a case-by-case basis to fit with the environment, commissioning the sites and then monitoring to ensure compliance.

Monitoring has been undertaken both at well sites and at sensitive receiver locations throughout the project. Monitoring at well construction sites has allowed the ongoing modification to plant and processes to lower source noise levels. Details of noise management measures are detailed in **Section 4** of this NMSP.

Examples of the noise reduction measures undertaken to date include:

1. Selection of quieter equipment;

2. Mud pump attenuation, including placing pumps on the ground to increase shielding of the main noise source and placing the pumps within improved acoustic enclosures;
3. Improvements to site design and layout, including identification of key noise sources and directionality to orientate the noise sources away from receivers;
4. Use of noise mufflers;
5. Use of noise walls to reduce noise from construction and operations;
6. Ongoing investigation of quieter replacement equipment for construction and maintenance;
7. Appropriate acoustic content in site inductions;
8. Monitoring at well heads to predict operational noise from various well heads and enclosures; and
9. Design of wellhead enclosures to reduce operational noise.

Extensive noise monitoring has given AGL greater experience in minimising noise and allows increased confidence in the accuracy of the latest noise models which depend on prediction of noise propagation from well sites at various distances. This monitoring information forms the basis of ongoing mitigation measures to ensure criteria can be met if there are changes in the background noise levels, or if sensitive receivers move closer to the well surface locations.

Monitoring has been completed on the major aspects of construction activities and operations including:

1. RPGP operation;
2. Various phases of well drilling and completion;
3. Producing wells;
4. Well workovers;
5. Well decommissioning; and
6. RPGP decommissioning.

Monitoring has been both at source and at sensitive receivers, allowing verification of noise prediction and confidence in mitigation techniques.

4 MANAGEMENT MEASURES

4.1 Environmental Management Mitigation Measures

AGL has adopted a continuous improvement process for noise management as part of the detailed site design process and continues to implement all reasonable and feasible noise source controls necessary to reduce noise from plant and equipment. Noise mitigation measures have been site-specific and applied as necessary.

Experience over recent years using best practice processes has allowed development of a range of noise mitigation measures that may be applied when required. For example, continuing investigation of the principal construction noise sources has led to the extensive acoustic modifications of mud pumps with in-built noise control.

Table 4-1 summarises the management measures, responsibility and timing of the procedures.

Table 4-1: Noise Management Measures

Activity	Management Measures	Responsibility
Induction	The employee and contractor induction shall inform all site personnel about noise management measures, hours of work and nearest sensitive receivers. All employees are responsible for managing noise from their work activities and working in a manner to minimise noise.	Environment Manager / All Personnel
Hours	Limit works to 7:00 am – 6:00 pm Monday to Friday and 8:00 am – 1:00 pm Saturday. Consider implementing respite periods and/or reduced hours to minimise impacts where the site may be close to receptors.	Operations Superintendent
Equipment	Ensure that plant and equipment is well maintained and operated and carry out maintenance as required. Where feasible, implement reduction measures as described in **Section 3.5** of this NMSP.	Operations Superintendent
Site Design and Planning Process	Best available practice to reduce noise from plant and equipment shall be investigated and applied during the site design and planning process.	Environment Manager
	Maximise offset distance between noisy plant items and nearby noise-sensitive receivers and orient equipment away from sensitive areas where practical.	Environment Manager & Operations Superintendent
	Implement site-specific recommendations arising from the Noise Assessment.	Operations Superintendent
Notification	Notice of works will be provided to relevant affected residents at least 14 days prior to commencing well decommissioning.	Community Relations Manager

Activity	Management Measures	Responsibility
Monitoring	Carry out environmental noise monitoring in accordance with the monitoring requirements specified in **Appendix A**. Keep records in accordance with **Section 5** and relevant Appendices of this report.	Environment Manager

5 MONITORING AND REPORTING

5.1 Monitoring of Decommissioning and Rehabilitation Works

Noise monitoring is generally only required for decommissioning and rehabilitation works that represent the most noise-intensive activities.

Monitoring requirements vary between sites and depend on the distance separating the site and the surrounding receivers (with more onerous requirements expected for wells closer to receivers). A noise review of wells at the CGP has identified the wells relatively close to receivers where monitoring of decommissioning activities is required. Results from the review are summarised in **Appendix B**.

It is important to note that some wells do not have explicit construction noise criteria set in the Project Approvals. For the purpose of the noise review, a daytime construction noise criterion of 45 dBA was conservatively assumed for wells without construction noise criteria. This is based on the minimum assumed day RBL of 35 dBA set by the *Npfl* and the construction management level of RBL + 10 dB set by the *ICNG* for construction works taking place during recommended standard hours.

Table 5-1 summarises the wells where monitoring of decommissioning activities is required.

Table 5-1: Wells with Decommissioning Monitoring Requirements

Gas Field	Well ID
Spring Farm	SF01, SF03, SF07, SF08 and SF09
Sugarloaf	SL02

The need for noise monitoring at other sites could be triggered by:

1. Receipt of noise complaints;
2. New residential receptors close to existing well sites;
3. Use of new equipment (monitoring to confirm); and
4. Variations to approved noise management measures.

Detailed monitoring procedures are given in **Appendix A**. The following points summarise the procedures that will be common to all noise monitoring for the project.

Measuring Instrument: Monitoring will consist of attended monitoring carried out in accordance with AS1055: Acoustics – Measurement and Description of Environmental Noise and the EPA *Npfl*.

Measurement Conditions: Meteorological conditions must be obtained for the time of monitoring. This is to include wind speed and direction as well as data suitable for quantifying the presence or otherwise of temperature inversions.

Measurement Interval: The monitoring interval shall be a 15-minute period.

Measurement Parameters: For construction and operational noise the measurement parameter is $L_{Aeq,15min}$.

Background Noise: The background noise level will be reviewed and if necessary re-established.

Monitoring Records and Reporting: For each monitoring site, the following information shall be reported:

1. Location, data and time;
2. Name of person/s performing monitoring;
3. Instrument, calibration status and calibration level before and after measurements;
4. Parameters measured and their results at each distance measured;
5. Weather conditions;
6. Background Noise Level; and
7. Sound levels from specific identifiable sources.

5.2 Internal Reviews

Regular reviews will be performed for work practices and on-site equipment to identify where practices can be improved, or in response to noise complaints received. This process will involve:

1. Identifying the noise sources particular to the site;
2. Random audits will be performed using *the Environmental Management Sub Plan Compliance Audit – Noise (AEL 8610872)* to proactively anticipate noise issues and instigate a resolution process and to ensure that previously identified control measures continue to be implemented; and
3. Regularly inspect and maintain on site equipment in good working order so as to generate less noise. This includes ensuring all noise reduction devices such as mufflers and silencers are fitted correctly and operative.

5.3 Reporting

Details of project performance against noise objectives will be reported in the Annual Environmental Performance Report (AEPR). A copy of the AEPR will be submitted to the Director General each year.

6 RECORDS

All records required to be kept by the EPL will be in a legible form, kept for at least four years and produced to any authorised officer of the EPA who asks to see them in accordance with the requirements of the EPL.

7 COMPLAINTS

The complaints management and incident reporting procedures are described in Section 5.3.4 of the EMP.

Should complaints be received regarding the effect of noise from the activities, the noise specific procedures shall include (but not be limited to):

1. Inspection of the location from which the complaint originated;
2. Measurement of noise levels (as relevant);
3. Comparison of the measured levels with the equivalent targets;
4. Identification of engineering control or management procedure (if appropriate) to be adopted to reduce the levels at the complainant location; and
5. Monitoring after implementation of the control or procedure to establish the level of reduction obtained.

8 NOISE MONITORING PROCEDURES

8.1 Pre-field Checks

Certain checks should be made before field measurements are obtained. These checks include:

1. checking the calibration status of instruments from copies of calibration certificates or labels on instruments;
2. inspecting instruments for physical damage, particularly the thread, diaphragm and protective grid of the microphone; (Caution: Do not remove the protective grid of the microphone and never touch the diaphragm.)
3. checking the battery condition of the SLM;
4. placing the microphone protection cap (if available) on the microphone; and
5. storing the SLM with no loose equipment in its carrying case if one is available.

The equipment is expensive and sensitive and must be treated accordingly. In-transit instructions include:

1. protecting equipment from unnecessary shock and vibration;
2. protecting equipment from extremes of heat (never leave equipment in a locked vehicle for any length of time during hot periods); and
3. protecting equipment from moisture/condensation.

8.2 Making Noise Measurements

Choose measurement positions taking into account:

1. the weather and other site considerations such as rain, wind noise and insect noise;
2. the location and direction of any noise source/s;
3. the most sensitive position at the affected premises where maximum noise levels are expected;
4. the need to avoid reflecting surfaces (where possible); and
5. the need to avoid atypical barriers (elevate microphone if appropriate).

Sketch measurement position(s) on the standard noise measurement form and include:

1. living areas identified as likely to be particularly affected by the source noise;
2. noise sensitive areas of premises;
3. noise source(s) direction and approximate distances;
4. relevant barriers, mounds, vegetation and ground cover in the separation zone;
5. wind direction and approximate speed;
6. location of measurement position(s) indicating distances from fixed reference points which are unlikely to change; and
7. identification of other land uses in the vicinity of the affected premises.

8.3 Use of Instruments

Set up the instrumentation at the appropriate location and allow it to stabilise to existing atmospheric conditions. Set or check the status of all function settings.

8.4 Measurement Position

Normally, measuring positions should be selected outdoors where representative maximum adjusted noise levels are expected or indicated by complainants.

Outdoor noise levels should normally be measured 1.2 m – 1.5 m above ground level or, in the case of elevated microphones, at the centre of windows.

The position(s) should be located:

1. within the apparent boundaries of land – at or near the boundary;
2. within 30 m during the day and evening period, and 3.5 m during the night period, of buildings normally used for human habitation (not hotels, motels and similar);
3. within 3.5 m of the external walls of educational buildings, the wards or bedrooms of hospitals, hotels, motels and similar;
4. at noise-sensitive locations on the boundaries of established commercial or industrial premises; and
5. within the apparent boundaries of passive recreation areas, such as picnic grounds, public gardens and parks.

The time periods commonly used for noise measurement purposes are:

1. Day: 7:00 am – 6:00 pm
2. Evening: 6:00 pm – 10:00 pm
3. Night: 10:00 pm – 7:00 am

Note: Microphones could need to be higher than 1.2 m – 1.5 m above ground level in certain situations. The principle to be applied when determining if the microphone height needs to be increased is whether the sound pressure level of the noise can be accurately represented at 1.2 m – 1.5 m above ground.

Situations where measurement at 1.2 m – 1.5 m above ground level may not give accurate or complete determination of the sound pressure level include the following:

1. low-set residences where a high boundary fence is close to the affected residence, (i.e. several metres away), and is providing a shield for a noise source(s), and is in turn generating a semi-reverberant sound field at low heights; and
2. high-set residences. In these situations, measurements might need to be conducted at 1.2 m – 1.5 m above ground level as well as at elevated microphone heights to ensure an accurate and representative determination of the adjusted average maximum sound pressure level is made.

Situations might also arise where high boundary fences act as shields in the path of the intrusive noise from the source to the residence, and where the residence is well separated from the boundary fence, such as when the fence is along the rear boundary. In these situations, measurement position(s) should be selected with a view to ensuring the principle of accurately and completely determining the sound pressure level is followed. If people affected are unlikely to be normally exposed to noise where maximum levels are expected, alternative points within the apparent boundaries of affected areas or premises can be used.

Measurement points closer to noise sources, or within or outside commercial or industrial premises and providing the worst-case noise situation, might be selected to assist assessment by:

1. avoiding contributions from other sources;
2. reducing atmospheric influences on noise propagation; or
3. ensuring ready access to measurement points not associated with affected premises.

8.5 Meteorological Conditions

Noise should be measured during fine weather conditions with calm to light winds (0 – 5 m/s at microphone height) and under the following conditions:

1. Wind speeds of up to 3 m/s at 10 m above ground level; or
2. Temperature inversion conditions of up to 3 degrees Celsius / 100 m and wind speeds of up to 2 m/s at 10 m above ground levels

A wind direction favouring noise propagation from source(s) to receiver(s) should be chosen if this is a true representation of the normal situation. Different conditions and their effects on measurements should be noted.

8.6 Background Sound Pressure Level

Background sound pressure level $L_{A90,T}$ is the A-weighted sound pressure level obtained using time-weighting 'F' exceeded for 90 percent of the measuring period 'T'.

The acceptable equivalent of $L_{A90,T}$ is RBL, the A-weighted sound pressure level obtained using the procedure in the *NPfI*.

The background sound pressure level is commonly denoted as background noise level and background level.

Obtaining an accurate background sound pressure level is important as it may be one of a number of criteria used to consider whether a noise from a source is reasonable. It may also form the basis of a reduction in noise emission levels to an acceptable level.

Complete and accurate determination of the background sound pressure level should be considered as an element in a successful environmental noise investigation. It can be used as the basis for the noise level limit set for noise from the source premises and therefore can be the basis for requiring a reduction of noise emissions to acceptable levels.

When possible, the same measuring points selected for source noise measurement should be used. Remote points should not be used to obtain background noise levels for determining limits.

Background noise measurements should be made at preferred locations in the absence of the noise being investigated.

If measurements cannot be made at an affected place because of other dominant noise sources, measurements are to be made instead at similar locations chosen very carefully to ensure equivalent background levels caused by traffic flow or general industrial activity.

Local knowledge of the area might be necessary to make appropriate selections.

Background noise levels should be measured during fine conditions with calm to light winds (0–5m/s). Different conditions and their effects on measurements should be noted.

Noise levels contributing to $L_{A90,T}$ should exclude noise from close traffic, birds, insects, animals and other similar noises, unless such noise is a normal or seasonal feature of the location which cannot be practically avoided. All noise levels should be written down and kept as a record.

Note: In relatively quiet areas, insect noise might tend to dominate background noise levels for large parts of the year, particularly during the warmer months. Lower ambient and background noise levels might generally be recorded during the winter months when insect activity is absent or at low levels. Careful consideration should be given to measurements of background noise levels in such instances.

8.7 Measurement of Noise

The noise level will be measured at the time of day when the noise may be considered excessive. The time interval for measurement, T, should be long enough to ensure that recorded data provide representative descriptions of measured noise.

For all measurements use time-weighting 'F' and measure the noise under investigation, unaffected by extraneous noise. Extraneous noise means all noise not emitted from the source(s) or premises of concern and includes such things as noise from passing traffic, seasonal insects and barking dogs.

For construction noise measure the $L_{Aeq,T}$.

8.8 Reporting

The following information should be recorded in the noise measurement form.

1. Description of source(s) and surroundings

   The report should include the following:

   i. description of the sound source(s);
   ii. location of source(s);
   iii. description and sketch of physical environment, including walls, ceilings, or room contents (if appropriate). If outdoors, trees, structures, reflecting objects, topographical features, and any other relevant features;
   iv. photographs if appropriate;
   v. air temperature and relative humidity where affected premises are greater than 250 m from source locations;
   vi. wind speed and direction; and
   vii. operating conditions of sound source(s).

2. Instrumentation

For all items of equipment used for the measurements, including calibration equipment, the following information should be recorded:

   i. name;

ii. manufacturer;
iii. type;
iv. serial number(s) (also of microphones, if removable); and
v. date of most recent laboratory calibration.

3. Acoustic data

The report should include the following, as appropriate:

i. location(s) of the measurement position(s), and microphone orientations;
ii. type of noise being measured;
iii. noise levels measured;
iv. frequency weighting used for each measurement;
v. time-weighting characteristic for each measurement;
vi. duration of each measurement period;
vii. background noise level with the source not in operation if possible;
viii. date and time when each measurement was performed (include justification of measurement period);
ix. tonality adjustment;
x. impulsiveness adjustment; and
xi. any other data considered appropriate.

In addition, the following qualitative information could be included to help interpret the results:

1. the possibility of locating the origin of the noise;
2. the possibility of identifying the sound source;
3. the character of the sound such as broad-band, impulsive, or tonal; and
4. other noise source(s) apparent at the time of measurement.

9 REFERENCES

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Part 1: General procedures
Part 2: Application to specific situations
Part 3: Acquisition of data pertinent to land use

AS1259-1990 *Acoustics – Sound level meters*
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Protection of the Environment Operations (General) Regulation 2022

Protection of the Environment Operations (Noise Control) Regulation 2017

NOISE OVERVIEW: ROSALIND PARK GAS PLANT

The RPGP has been fully decommissioned and the following noise overview is provided for completeness only.

A.1.1 Noise Limits

Noise from the RPGP premises must not exceed the noise limits specified in the Conditions of Approval (DA 282-6-2003) as summarised below:

DA 282-6-2003 CoC 29 (Sch 4): Noise Limits

Receiver Location	Day $L_{Aeq(15min)}$	Evening $L_{Aeq(15min)}$	Night $L_{Aeq(15min)}$	Flaring (Night) $L_{A1(1min)}$
R1 Medhurst Road, Gilead	35	35	35	45
R7 Mt. Gilead, Gilead	37	36	36	45

Noise for flaring event, must not exceed the noise limits in the table below:

DA 282-6-2003 CoC 31 (Sch 4): Flaring Events

Receiver Location	Type of Flare Event	Duration of Flare Event	Day $L_{Aeq(15min)}$	Evening $L_{Aeq(15min)}$	Night $L_{Aeq(15min)}$
R1 Medhurst Road, Gilead	Spill valve	> 2.5 hours	35	35	35
	Compressor blowdown (ESD)	15 - 60 minutes	40	40	35
	Compressor blowdown (shut down and unload)	6 - 15 minutes	42	42	37
R7 Mt. Gilead, Gilead	Spill valve	> 2.5 hours	37	36	36
	Compressor blowdown (ESD)	15 - 60 minutes	42	41	40
	Compressor blowdown (shut down and unload)	6 - 15 minutes	44	43	37

The above limits do not apply to pressure safety valve (discharge) and pressure safety valve (suction) flaring events. Note that flaring has now ceased due to the closure of the RPGP.

A.1.2 Nearest Receivers

The receiver locations R1 and R7 are as shown in **Figure A.1**.

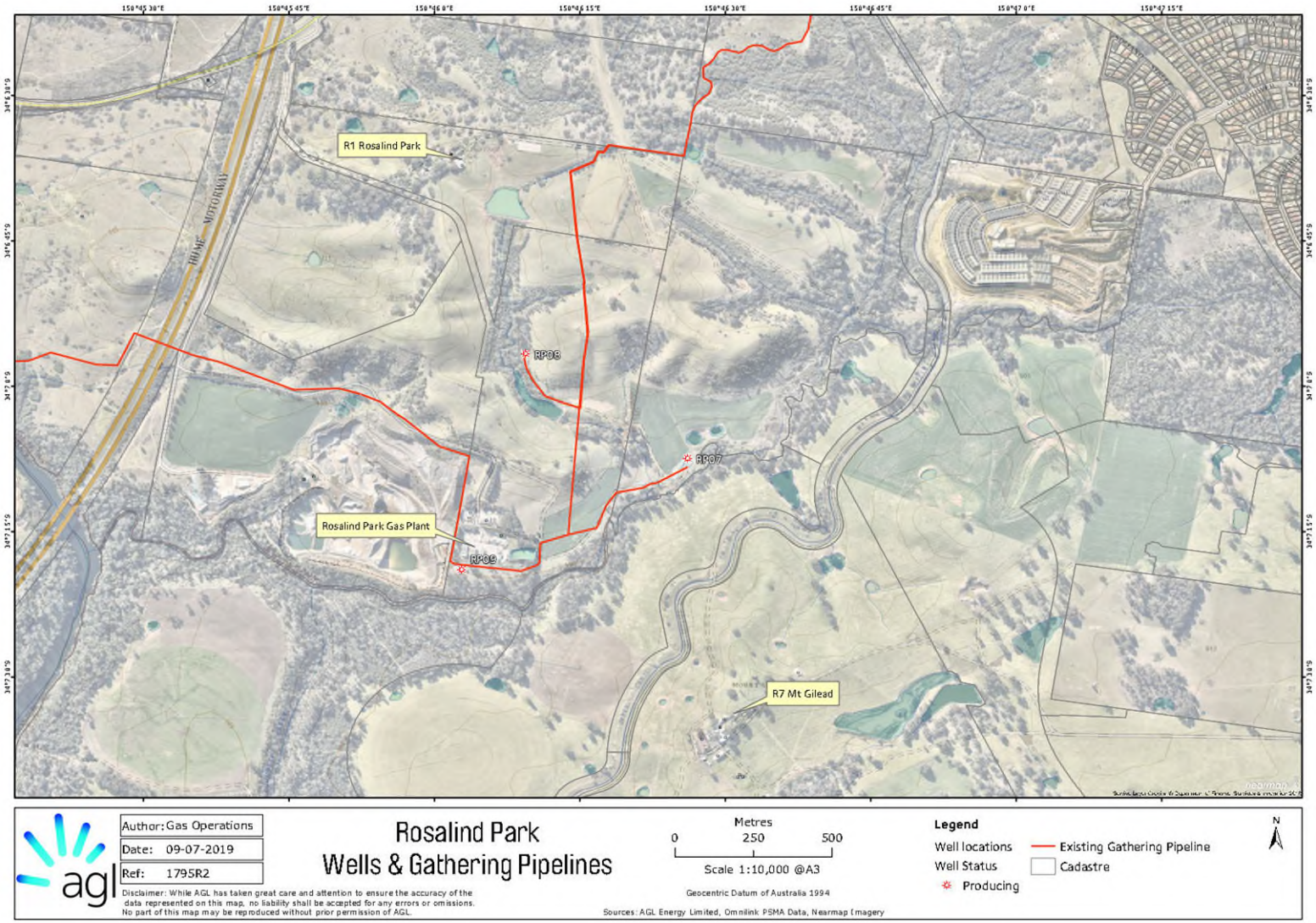

Figure A.1 Approximate Locations for R1 and R7 receivers

NOISE OVERVIEW: SUGARLOAF

A.4.1 Noise Limits

Noise from the drilling and construction of the Sugarloaf wells SL08 and SL09 must not exceed the sound pressure limits specified in Conditions of Consent (DA 75-4-2005) as summarised below.

DA 75-4-2005 Condition 18A (Schedule 2): Construction Noise Criteria

Location (nearest residential dwelling)	Day	Evening	Night	Saturday (1pm-6pm) Sunday (7am-6pm)
	$L_{Aeq(15min)}$	$L_{Aeq(15min)}$	$L_{Aeq(15min)}$	$L_{Aeq(15min)}$
Nearest receptor	54	47	41	44

Noise from the operation of the Sugarloaf wells must not exceed the noise criteria specified in Conditions of Consent (DA 75-4-2005) as summarised below.

DA 75-4-2005 Condition 18 (Schedule 2): Operational Noise Criteria

Location	Day	Evening	Night	
	$L_{Aeq(15min)}$	$L_{Aeq(15min)}$	$L_{Aeq(15min)}$	$L_{A1(1min)}$
Any residential premise	35	35	35	45

A.4.2 Nearest Receivers

1. Sugarloaf Farm – 670 metres away,
2. Principal's Residence at Broughton College – 420 metres away.

A.4.3 Monitoring Requirements

Noise monitoring will be carried out at each well head to ensure that noise emissions resulting from the operation do not exceed the relevant operational noise criteria.

Monitoring will consist of attended monitoring carried out in accordance with *AS1055: Acoustics – Measurement and Description of Environmental Noise* and the NSW Environment Protection Authority (EPA) Industrial Noise Policy.

In addition, meteorological conditions must be obtained for the time of monitoring. This is to include wind speed and direction as well as data suitable for quantifying the presence or otherwise of temperature inversions.

Frequency: Monitoring should be carried out within the first week of production and again after three months for each well, then if the well status changes for the Sugarloaf well identified in **Table 5-1**.

Locations: Refer to Section 8.4 of this NMSP.

Interval: The monitoring interval shall be a 15-minute period.

Parameters: Parameters to be recorded includes $L_{Aeq,15min}$.

Instruments: Instruments used for attended monitoring shall be of Type 1 – Precision grade in accordance with the requirements of *Australian Standard 1259 – Sound Level Meters*. Measurements methodology shall be in compliance with *Australian Standard 1055 – Acoustics- Description and Measurement of Environmental Noise*.

Reporting: For each site, the following shall be reported:

1. Location, date and time;
2. Instrument, calibration status and calibration level before and after measurements;
3. Parameters measured and their results;
4. Weather conditions; and
5. Sound levels from specific identifiable sources.

A.4.4 Site-Specific Mitigation Measures

If noise monitoring data exceed the noise level, mitigation measures should be installed at the well head and further monitoring carried out until the criteria is met.

NOISE OVERVIEW: MENANGLE PARK

A.5.1 Noise Limits

AGL shall use its best endeavours undertake construction activities to comply with below construction noise goals.

PA06_0291 Condition 3 (Schedule 3): Construction Noise Goals

Location (nearest residential dwelling)	Day	Evening	Night	Saturday (1pm-6pm) Sunday (7am-6pm)
	$L_{Aeq(15min)}$	$L_{Aeq(15min)}$	$L_{Aeq(15min)}$	$L_{Aeq(15min)}$
MP02, MP03, MP04	49	47	41	47
MP05, MP06	40	40	40	40
MP11, MP24, MP33	42	42	40	42
MP19 (R3)	40	40	40	40
MP19 (R25)	49	47	41	47
MP21, MP22, MP23	49	47	41	47

Noise from the operation of the Menangle Park wells will not exceed the noise criteria specified in Conditions of Consent (PA06_0291) as summarised below.

PA06_0291 Condition 5 (Schedule 3) Operational Noise Criteria (dBA)

Location (nearest residential dwelling)	Day	Evening	Night
	L_{Aeq}	L_{Aeq}	L_{Aeq}
MP05. MP06, MP11	40	40	40
MP19, MP21, MP24, MP33	42	42	40
MP02, MP03, MP04, MP22, MP23	49	45	40

A.5.2 Monitoring Requirements

Noise monitoring will be carried out at each well head to ensure that noise emissions resulting from the operation do not exceed the relevant operational noise criteria.

Monitoring will consist of attended monitoring carried out in accordance with *AS1055: Acoustics – Measurement and Description of Environmental Noise* and the NSW Environment Protection Authority (EPA) Industrial Noise Policy.

In addition, meteorological conditions must be obtained for the time of monitoring. This is to include wind speed and direction as well as data suitable for quantifying the presence or otherwise of temperature inversions.

Frequency: Monitoring should be carried out within the first week of production and again after three months for each well, then if the well status changes for the Menangle Park well identified in **Table 5-1**.

Locations: Refer to Section 8.4 and Figure A.4 of this NMSP.

Interval: The monitoring interval shall be a 15-minute period.

Parameters: Parameters to be recorded includes $L_{Aeq,15min}$.

Instruments: Instruments used for attended monitoring shall be of Type 1 – Precision grade in accordance with the requirements of *Australian Standard 1259 – Sound Level Meters*. Measurements methodology shall be in compliance with *Australian Standard 1055 – Acoustics- Description and Measurement of Environmental Noise*.

Reporting: For each site, the following shall be reported:

1. Location, date and time;
2. Instrument, calibration status and calibration level before and after measurements;
3. Parameters measured and their results;
4. Weather conditions; and
5. Sound levels from specific identifiable sources.

A.5.3 Site-Specific Mitigation Measures

If noise monitoring data exceed the noise level, mitigation measures should be installed at the well head and further monitoring carried out until the criteria is met.

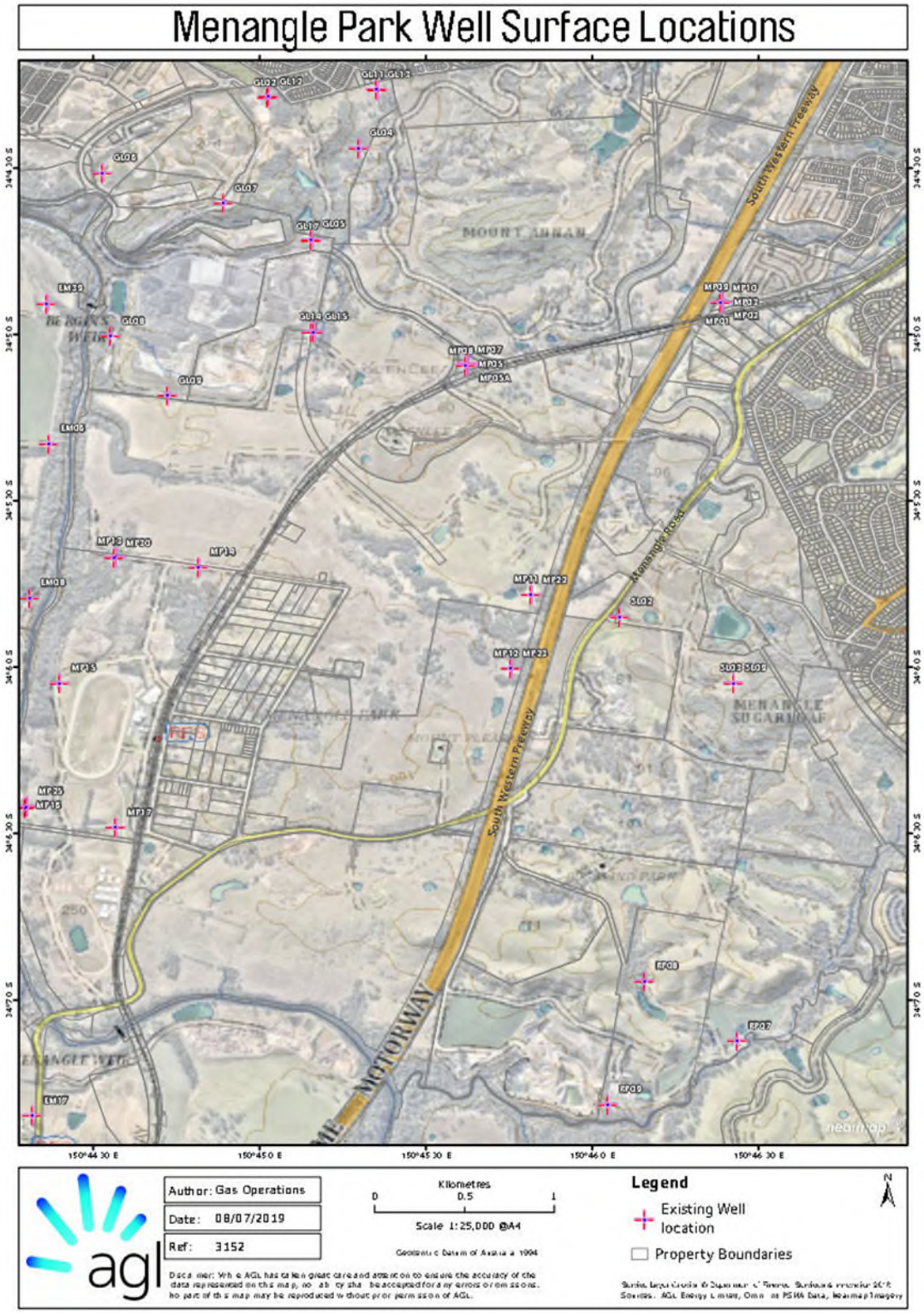

Figure A.2 Location of Menangle Park Wells & Sensitive Receivers

NOISE OVERVIEW: SPRING FARM

A.6.1 Noise Limits

AGL shall use its best endeavours undertake construction activities to comply with below construction noise goals.

PA06_0291 Condition 3 (Schedule 3): Construction Noise Goals

Location (nearest residential dwelling)	Day	Evening	Night	Saturday (1pm-6pm) Sunday (7am-6pm)
	$L_{Aeq(15min)}$	$L_{Aeq(15min)}$	$L_{Aeq(15min)}$	$L_{Aeq(15min)}$
SF04a	43	42	37	42
SF10, SF17, SF20	43	41	36	43

Noise from the operation of the Spring Farm wells will not exceed the noise criteria specified in Conditions of Consent (PA06_0291) as summarised below.

PA06_0291 Condition 5 (Schedule 3) Operational Noise Criteria (dBA)

Location (nearest residential dwelling)	Day	Evening	Night
	L_{Aeq}	L_{Aeq}	L_{Aeq}
Figure A.4	43	42	37
Figure A.4	43	41	36

A.6.2 Monitoring Requirements

Noise monitoring will be carried out at each well head to ensure that noise emissions resulting from the operation do not exceed the relevant operational noise criteria.

Monitoring will consist of attended monitoring carried out in accordance with *AS1055: Acoustics – Measurement and Description of Environmental Noise* and the NSW Environment Protection Authority (EPA) Industrial Noise Policy.

In addition, meteorological conditions must be obtained for the time of monitoring. This is to include wind speed and direction as well as data suitable for quantifying the presence or otherwise of temperature inversions.

Frequency: Monitoring should be carried out within the first week of production and again after three months for each well, then if the well status changes for Spring Farm wells identified in **Table 5-1**.

Locations: Refer to Section 8.4 and Figure A.5 of this NMSP.

Interval: The monitoring interval shall be a 15-minute period.

Parameters: Parameters to be recorded includes $L_{Aeq,15min}$.

Instruments: Instruments used for attended monitoring shall be of Type 1 – Precision grade in accordance with the requirements of *Australian Standard 1259 – Sound Level Meters*. Measurement methodology shall be in compliance with *Australian Standard 1055 – Acoustics- Description and Measurement of Environmental Noise*.

Reporting: For each site, the following shall be reported:

1. Location, date and time;
2. Instrument, calibration status and calibration level before and after measurements;
3. Parameters measured and their results;
4. Weather conditions; and
5. Sound levels from specific identifiable sources.

A.6.3 Site-Specific Mitigation Measures

If noise monitoring data exceed the noise level, mitigation measures should be installed at the well head and further monitoring carried out until the criteria is met.

A.6.4 Nearest Receivers

Figure A.3 Location of Spring Farm Wells & Sensitive Receivers

DECOMMISSIONING MONITORING REQUIREMENTS - NOISE REVIEW RESULTS

Gas Field	Project Approval	Well surface location	Well Site	Status	Distance to Closest Receiver[1]	Construction Noise Goal – Day (dBA)	Minimum Distance Required to Comply (m)	Outcome: Need to measure? Yes / No
Spring Farm	PA 06_0291	SF17	SF01	Shut in – to be decommissioned	58	43	268	Yes
			SF03	Shut in – to be decommissioned	58	43	268	Yes
		SF20	SF07	Shut in – to be decommissioned	50	43	268	Yes
			SF08	Shut in – to be decommissioned	50	43	268	Yes
			SF09	Shut in – to be decommissioned	50	43	268	Yes
Menangle Park	PA 06_0291	MP03	MP01	Decommissioning in progress	53	-	-	-
			MP02	Decommissioning in progress	53	49	130	Yes
			MP03	Decommissioning in progress	53	49	130	Yes
			MP09	Decommissioning in progress	53	49	130	Yes

Gas Field	Project Approval	Well surface location	Well Site	Status	Distance to Closest Receiver[1]	Construction Noise Goal – Day (dBA)	Minimum Distance Required to Comply (m)	Outcome: Need to measure? Yes / No
Sugarloaf	DA 75-4-2005	SL02	SL02	Decommissioning in progress	177	45[2]		Yes
Glenlee	DA 9-1-2005	GL06	GL06	Shut in – to be decommissioned	400	45[2]		No
	DA 282-6-2003i	GL09	GL09	Shut in – to be decommissioned	245	-	-	No

Notes:

1. Distance between well site and residential property boundary conservatively assumed to be 30 metres from the residence (instead of residence itself) in accordance with the *NPfI*.
2. No explicit construction noise criterion set in the Project Approval for this well site so construction noise criterion was taken to be 45 dBA (based on the minimum assumed day RBL of 35 dBA set by the *NPfI* and the construction management level of RBL + 10 dB set by the *ICNG* for construction works taking place during recommended standard hours).