Heron Resources Limited
Tarago Operations Pty Limited

Woodlawn Mine

SML 20

Noise and Blast Management Plan

August 2017

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1. Introduction

1.1 Purpose

The control of noise from the premises during both the construction and operational phases is a key environmental issue despite the remote nature of the site and the lack of nearby non-company controlled premises. The purpose of this Noise and Blasting Management Plan (NBMP) is to document the control measures and management initiatives to control noise from mobile plant and equipment and blasting activities for the construction and operation of the Woodlawn Mine Project shown on Plans 1 and 2.

The NBMP forms one component of the overall Project Environmental Management Strategy (EMS). The EMS includes a number of commitments and component management plans which together form the basis for the ongoing operation of the Woodlawn Mine.

As with any development project, changes will arise throughout the construction and operational phases. The EMS and component management plans will be updated as required to reflect any changes to the development project.

The NBMP provides a working document for day-to-day management of the site which will assist with ensuring the operation complies with approval requirements. The plan covers all aspects of noise management on site including: monitoring, complaints handling, performance indicators, training, roles and responsibilities and the recommended revision procedure.

1.2 Scope and Objectives

This NBMP has been developed with Pacific Environment Pty Limited who undertook the original Noise and Blasting Assessment contained in the Environmental Assessment and subsequent project modification application. Input from Pacific Environment is contained as Appendix B which covers the entire operation while additional blasting assessment undertaken by XCut is provided as Appendix C. This NBMP covers primarily the construction component of the project including:

- ❒ Mobilisation of construction equipment.
- ❒ Initial surface disturbance and construction area set up.
- ❒ Earthworks and required erosion and sedimentation controls.
- ❒ Control of noise and blasting impacts during construction.
- ❒ Blast controls and protocols.
- ❒ Erection of temporary buildings and contractors facilities.
- ❒ Erection of all permanent buildings, infrastructure, hardstand and car parking.
- ❒ Construction of the process plant including installation of processing equipment, material handling and storage areas.
- ❒ Construction of a new tailings storage facility.
- ❒ Construction of the box cut, portal and underground entry area including paste fill plant shown on Plan 3.

- Construction of the new haul road between the underground entry site and the processing plant area.
- Erection of tailings retreatment equipment and infrastructure.
- Establishment of the waste rock emplacement.
- Temporary and permanent revegetation work.

An update to this NBMP plan will be required prior to the commissioning of the processing infrastructure. Specific noise management procedures are expected to be implemented for the crushing plant, ore transport and stockpile management components. The tailings retreatment process is not considered to warrant specific noise controls but will be reviewed for completeness.

The overall objectives for this NBMP are to:

- Implement the commitments made in the EA including specific conditions of approval and the Statement of Commitments.
- Ensure compliance with relevant environmental legislation.
- Manage noise risks associated with the Woodlawn Project.
- Provide for continuous improvement in noise control performance.
- Manage blasting activities as required to meet overpressure and ground vibration criteria.
- Provide a mechanism to identify and correct areas of non-compliance.

1.3 Key Personnel and Responsibilities

Management responsibility for the Woodlawn Mine will be as follows.

Table 1 - Management Responsibilities

Position	Personnel	Company	Responsibility	Contact Details
Managing Director	Wayne Taylor	Heron Resources	Overall responsibility for the construction and operation of the Woodlawn Mine	02 9119 8111
Chief Operating Officer	Andrew Lawry	Heron Resources	Responsible for Project delivery and operations	02 9119 8111
Project Manager	To be appointed	Heron Resources	Construction Project Management and Implementation	02 9119 8111
Manager Mining Engineering	To be appointed	Heron	Mine Planning and Design	02 9119 8111
General Manager	Brian Hearne	Heron Resources	Conduct of Mining Operations	02 9119 8111
Exploration Manager, Chief Geologist	David von Perger	Heron Resources	Resource Evaluation	02 9119 8111
Environmental Manager	Robert Byrnes	IEC	Conduct of environmental management and compliance	02 4878 5502
Woodlawn Mine Environmental Officer	Zoe Reed	Heron	On site environmental management	02 9119 8111

The above table will be updated with the confirmation of the Lead Construction Contractor when appointed.

1.3.1 Responsibility

The **Managing Director** has overall responsibility for the implementation of the EMS at Woodlawn Mine as well as to review and approve expenditure and resources necessary to effectively implement the EMS and individual management plans.

The **Chief Operating Officer (COO)** reports to the Managing Director and is responsible for Project delivery and ultimate development and operation of the Project.

The **Project Manager** will ensure that the approved management provisions and requirements of the individual Environmental Management Plans and commitments are implemented. The Project Manager will review and evaluate the performance of the EMS program and environmental protection initiatives. This role may be merged with the Mine Manager during the construction period prior to commissioning.

The **Construction Manager** will be responsible for the day to day management of the construction workforce, implementation of the Construction EMP and report directly to the Project Manager.

The **Mine Manager** is responsible for the day to day management of the mine and overview role for environmental management systems on site, which will include:

- ❒ Ensuring compliance with environmental requirements for the site.
- ❒ Represent the on site contact officer under the Environment Protection Licence and other statutes.
- ❒ Report to the COO on a monthly basis on the environmental performance of mine.
- ❒ Liaise with the Environmental Officer on environmental matters as required.

The **Environmental Manager** will provide the following assistance with the EMS:

- ❒ Provide technical assistance on environmental matters to the Mine Manager.
- ❒ Undertake the necessary environmental monitoring program.
- ❒ Organise external environmental experts as required.
- ❒ Organise external environmental audits of the site on an annual basis.
- ❒ Develop Corrective Action Programs in consultation with the Mine Manager and monitor their implementation.
- ❒ Develop and implement an Environmental Training Package for the Mine.

1.3.2 Company Structure

The Woodlawn Project will be developed by Tarago Operations Pty Limited, a wholly owned subsidiary of Heron Resources Limited (Heron) which merged with TriAusMin Limited who was the original proponent for the project.

The Woodlawn Mine will be developed as a “greenfield project” despite its long history and existing infrastructure. The construction program will be managed by Heron using construction contractors. Once commissioned, the new facility will be operated by Heron through its subsidiary Tarago Operations.

1.4 Legislative Requirements

Of relevance to the construction component of the Woodlawn Mine Project is the following legislation.

Mining Act 1992 – This Act covers the exploration and extraction of the State's resources having regard to the need to encourage ecologically sustainable development. It provides a framework for compensation to landholders for loss or damage resulting from such operations and requires the payment of security to provide for the rehabilitation of mine sites, effective rehabilitation of disturbed land and water, and ensures mineral resources are identified and developed in ways that minimise impacts on the environment

Environmental Planning and Assessment Act 1979 – Provides the primary approval path for mining projects and sets environmental management and reporting conditions as part of the approval. For new mining approvals, it also provides an integrated approach to other mining related approvals. Woodlawn Mine holds Project Approval 07_0143 covering its development and operations. The Project Approval requires that a Construction Management Plan be prepared prior the commencement of construction.

Protection of the Environment Operations Act 1997 (POEO Act) - The POEO Act is administered by the Environment Protection Authority (EPA) and requires licensing for environmental protection, including waste generation and disposal, water, air and noise pollution. Under the POEO Act, an EPL is required for the Woodlawn Mine as it is defined as a scheduled activity. EPL 20821 has been issued by the EPA and is provided as Appendix E. The site has now been divided between EPL 11436 held by Veolia Environmental Services (Australia) Pty Limited (VES) and a separate part of the site by Infigen as shown on Plan 2.

Protection of the Environment Legislation Amendment Act 2011 – The POELA Act requires the preparation and implementation of a pollution incident response management plan. Pollution Incident response procedures are included in a separate plan.

Roads Act 1993 – All product concentrate produced at Woodlawn will be transported by road to either Port Kembla or Port Botany. Local roads leading to the Hume Highway are covered by the Roads Act and works and will be subject to a Road Transport Protocol in accordance with Condition 26 of the Project Approval. The Protocol requires monitoring of the trucking and be prepared in consultation with Council and Roads and Maritime Services.

Industry Guidelines
The following industry guidelines are also relevant to this NBMP:

- AS 1055.1,2,3-1997: Acoustics – Description and measurement of environmental noise, and
- NSW Industrial Noise Policy (INP) (EPA, 2000).

1.5 Project Approval Requirements

The Woodlawn Project received Project Approval on 4th July 2013 with subsequent modifications received on 22nd April 2016 and 6th July 2017. The approval was obtained

under the provisions of Part 3A of the Environmental Assessment Act 1979 and following the public exhibition of an Environmental Assessment document.

The EA contained a number of environmental commitments while the Project Approval was also subject to conditions. Specifically, the conditions and Proponent commitments relating to the preparation of a Noise and Blasting Plan is as follows:

Table 2 - Consent Conditions Relating to Noise and Blasting

Condition	Description	Where Addressed
Sch 4 Condition 5	Sets out noise assessment criteria, being 35 $L_{Aeq(15\ minute)}$ for Day, Evening and Night periods and a 45 $L_{A1\ (max)}$ for Night time periods. Specific meteorological conditions under which these criteria apply are also set. However, these criteria do not apply if the Proponent has an agreement with the relevant owner(s) to exceed the criteria, and the Proponent has advised the Department in writing of the terms of this agreement.	Section 2.1
Sch 4 Condition 6	The Proponent shall implement best management practice, including all reasonable and feasible noise mitigation measures, to minimise the construction, operational, low frequency and road noise from the project, to the satisfaction of the Secretary.	Section 2.1 Section 3.1
Sch 4 Condition 7	The Proponent shall prepare and implement a Noise Management Plan for the project to the satisfaction of the Secretary. The plan must: (a) be prepared in consultation with the EPA, and submitted to the Secretary for approval prior to commencing construction on the site; (b) describe the measures that would be implemented to minimise noise generated by the project, including road noise at the St Andrews Anglican Church; (c) include a monitoring program that: • uses attended monitoring to evaluate the performance of the project; • includes a protocol for determining exceedances of the criteria identified in Table 3; • evaluates and reports on the effectiveness of the noise management system on site; and (d) describe how noise management and monitoring on the site would be integrated with the Woodlawn Landfill.	This Plan Consultation Log Appendix F Section 3.4 Subject to future NBMP for operations Section 3.1 Section 5.2 Section 5.3 Section 3.3
Sch 4 Condition 8	The Proponent shall ensure that blasting on the site does not cause exceedances of the criteria in Table 5. This table requires no blasts to	Section 2.1 and 2.2

	exceed an overpressure of 120: dB(Lin Peak) and ground vibration exceeding 10 mm/sec, Daytime levels of 115 dB(Lin Peak) and 5 mm/sec with evenings at 2 mm/sec and nightime, Sundays and public holidays at 1 mm/sec. Allowable exceedence of 5% of the total number of blasts over a period of 12 months with the exception of Sundays and public holidays. *All blasts are to be designed by a suitably qualified and experienced blasting engineer*	Section 3.1
Sch 4 Condition 9	Surface blasting between 9am to 5pm Monday to Friday, excluding public holidays Underground blasting can occur anytime	Section 2.2
Sch 4 Condition 10	In relation to above ground blasting, the Proponent may carry out a maximum of 1 blast per day, unless an additional blast is required following a blast misfire. This condition does not apply to blasts required to ensure the safety of the site or its workers, and to minor additional blasts required during the construction of the box cut to access the underground workings. *For the purpose of this condition, a blast refers to a single blast event, which may involve a number of individual blasts fired in quick succession in a discrete area of the site.*	Section 2.2
Sch 4 Condition 11	During operation of the project, the Proponent shall implement best management practice to: (a) protect the safety of people and livestock in the surrounding area; (b) protect public or private infrastructure/property in the surrounding area from any damage; and (c) minimise the dust and fume emissions from any blasting; and to the satisfaction of the Secretary.	Operational NBMP to be prepared prior to operations commencing Section 3.4
Sch 4 Condition 12	The Proponent shall prepare and implement a Blast Management Plan for the project to the satisfaction of the Secretary. This plan must: (a) be prepared in consultation with the Veolia and Infigen Energy, and submitted to the Secretary for approval prior to commencing blasting on the site; (b) describe the process for incrementally developing and monitoring blasting design; (c) describe the blast mitigation measures that would be implemented to ensure compliance with the blasting criteria in Table 4; and (d) include a blast monitoring program to	Chapter 2 and Section 3.1 Section 4.3 Section 5.1 Section 5.1 Section 5.2

	evaluate the performance of the project.	
Sch 5 Condition 1	Notification of land owners of any exceedence of noise criteria. Provisions for independent review of data and compliance status	Section 4.4
Statement of Commitments Item 8A	The NMP as part of the CEMP would include: ❒ Construction hours - work during daytime where possible ❒ noise and vibration monitoring on-site and at privately owned sensitive receivers ❒ training and awareness regarding construction noise impacts and management (including education and training of site staff) ❒ communications regarding construction noise impacts and management and complaints handling ❒ non-conformance, preventative and corrective action.	Section 2.4 Section 5.1 Section 4.1 and 4.2 Section 5.3 Section 5.4 Section 5.2
Statement of Commitments Item 8B	Tarago Operations would consult with representatives from the St Andrews Anglican Church (Tarago) to further investigate potential noise impacts from Project operational traffic during the hours of 6am-7am. If the consultation concludes significant impacts are expected then Tarago Operations would explore reasonable and feasible mitigation measures, in consultation with the Church.	Future NMP for ongoing operations
Statement of Commitments Item 8C	A negotiated agreement would be prepared between Tarago Operations and Veolia for managing construction and operational noise impacts on the Woodlawn and Cowley Hills properties. Staff training strategies to be implemented during construction and operation would also have specific focus on minimising noise impacts on these properties.	Section 3.1
Item 8D	A negotiated agreement would be prepared between Tarago Operations and Veolia for managing impacts of blasting on the Project Site experienced at Cowley Hills and Woodlawn Farm properties. Methods would be developed to ensure blast vibrations and airblast overpressures do not exceed the criteria (nominated in the EA) at any privately owned sensitive receiver. Tarago Operations would monitor blasting impacts to ensure blasting criteria are satisfied.	Section 3.3

1.6 Consultation

This Plan has been formulated through a process of consultation with government and non-government organisations. A consultation log is provided in Appendix F which will be updated as required during the construction and ongoing operation of the Woodlawn Mine.

2. Noise Criteria

2.1 Noise Assessment Criteria

In accordance with Schedule 4, Condition 5 of the Project Approval, the Proponent shall ensure that the noise generated by the project does not exceed the criteria at any residence on privately-owned land. The Criteria are reproduced in Table 3.

Table 3: Noise Criteria dB(A)

Receivers	Day/ Evening /Night ($L_{Aeq\ 15\ minute}$)	Night (L_{A1Max})
All residential receivers	35	45

Note: After the first review of any EPL granted for this project under Section 78 of the POEO Act, nothing in this approval prevents the EPA from imposing stricter noise limits on the mining operations on site under the EPL.

Meteorological conditions under which the noise conditions apply are included in Appendix 5 Condition 1 and 2 of the Project Approval. These conditions are reproduced in Table 4.

Table 4: Applicable Meteorological Conditions

Development Conditions Requirement – Management Plan Requirements
1. The noise criteria in Table 3 of the conditions are to apply under all meteorological conditions except the following:
(a) during periods of rain or hail; (b) average wind speed at microphone height exceeds 5 m/s; (c) wind speeds greater than 3 m/s measured at 10 m above ground level; or (d) temperature inversion conditions greater than 3°C/100 m.
2. Except for wind speed at microphone height, the data to be used for determining meteorological conditions shall be that recorded by the meteorological station located on the site.

Condition 3 and 4 of Appendix 5 of the Project Approval provides details of the required compliance monitoring. Specifically that monthly attended noise monitoring be undertaken and unless otherwise approved by DPE, all monitoring is to be conducted in accordance with the NSW Industrial Noise Policy relating to:

- ❒ monitoring locations for the collection of representative noise data;
- ❒ meteorological conditions during which collection of noise data is not appropriate;
- ❒ equipment used to collect noise data, and conformity with Australian Standards relevant to such equipment; and
- ❒ modifications to noise data collected, including for the exclusion of extraneous noise and/or penalties for modifying factors apart from adjustments for duration.

These criteria do not apply if the Proponent has an agreement with the relevant owner(s) to exceed the criteria, and the Proponent has advised the Department of Planning in writing of the terms of this agreement (Schedule 4 Condition 5).

In accordance with Schedule 4, Condition 6 of the Project Approval, Tarago Operations shall implement best management practice, including all reasonable and feasible noise mitigation measures, to minimise the construction, operational, low frequency and road noise from the project.

An exceedance of any of these criteria constitutes a noise emission incident.

2.2 Blasting Criteria

The maximum level of airblast overpressure in regard to annoyance is 115 dB(Lin Peak). This may be exceeded on up to 5% of the total number of blasts over 12 months; however, the level shall not exceed 120 dB(Lin Peak). Similarly for ground vibration, the maximum level in regard to annoyance is 5 millimetres per second (mm/sec) peak particle velocity (ppv). This level may be exceeded on up to 5% of the total number of blasts over 12 months, while not exceeding 10 mm/sec.

Blast designs will meet or exceed specific requirements of the publication Australian and New Zealand Conservation Council's (ANZECC 1990) *Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration.* Should explosives be stored on site, the storage facilities shall meet Standards Australia's (AS 2187.2-2006) *Explosives – Storage and Use* and (AS 2107:2000).

In accordance with Condition 10 of Schedule 4 of the Project Approval, surface blasting is to be undertaken between 9am to 5pm Monday to Friday, excluding public holidays while underground blasting can occur anytime. Only one surface blast per day is to be undertaken although this may consist of several charges in multiple holes set up on a quick succession time delay.

All blasts are to be designed by a suitably qualified and experienced blasting engineer and monitored for both overpressure and ground vibration. Any exceedence in criteria will result in a change in blast design in order to meet the criteria.

2.3 Noise Sources

All equipment expected to be utilised in the construction and operational phases are listed in Table 3.2 of Appendix B. The use of this equipment has been assessed in the EA as capable of complying with the noise criteria listed in Tables 3 and 4 above.

2.3.1 Construction

The construction program will commence initially with the mobilisation of earthmoving equipment and erection of temporary contractor facilities. As the first task is to construct the box cut and portal entry, access will be provided using the existing internal roads associated with the Bioreactor. This component will extend over a 12 month period consisting of 1 month for equipment mobilisation and relocation of the existing dolerite stockpile, 3 months to establish the box cut and portal followed by 8 months of underground development of the decline access. During the development of the decline, other surface works will be occurring including the main access road and hardstand areas for the new process area in Hickory's Paddock.

The main processing area in Hickory's Paddock, shown on Plan 2 will include establishment of initial soil and water management controls, access road construction, establishing hardstand and foundation levels for several buildings, compounds, ore stockpiles and waste rock emplacement. This component will require typical cut and fill earthmoving using mobile plant such as dozers and scrapers. Sources of noise for the construction phase include:

- Bulldozer stripping topsoil and subsoil material;
- Earthmoving equipment excavating the decline portal, cut and fill and road building;
- Drill rig;
- Front End Loaders loading/unloading material;
- Trucks transporting excavated material;
- Graders, rollers and compactors for road pavements and hardstands;
- Water Cart;
- Cranes used to erect buildings;
- Various mobile plant and equipment including backhoes, bobcats, trucks, compressors and generators;
- Blasting for the box cut; and
- General site vehicles and activity.

After 2 months into the construction of the decline portal, noise and vibrations felt at the surface would be significantly reduced due to the depth of blasting. Within 12 months, the majority of the earthmoving equipment would have left the site with the remaining equipment involved in building and infrastructure erection.

Noise generated during the latter part of the construction program will overlap mining activities as material used for the construction of TSF4 will be generated from the development of the decline.

2.3.2 Operational Noise Sources

Once operational, noise sources will include the processing plant and infrastructure to support the retreatment and underground operations. Primary noise sources will include:

- Transport of ore from the mine entry to the ROM Pad;
- Handling of ore on the ROM Pad by dozer and Front End Loader;
- Primary, secondary and tertiary crushing equipment;
- Conveyors, loading hoppers and vibrating screens;
- Ventilation fan installations;
- Paste Fill Plant;
- Processing plant and concentrator; and
- Truck loading and dispatch.

Blasting will continue throughout the operational phase but would be confined to the underground workings. This NBMP will be further updated prior to commissioning the main

processing plant to ensure that all sources of dust have been identified and adequately controlled as necessary.

2.4 Hours of Operation

Construction activities involving earthmoving equipment and noisy activities will generally occur during day light hours where possible, 7.00am to 7.00pm, 7 days per week. Some very minor activities will occur during the evening periods such as equipment maintenance, delivery of supplies and building fitout. Only activities that are deemed to be low noise generating will occur.

Once the processing plant is commissioned, this component will operate 24 hours per day 7 days per week. The underground operation will also operate continuously in order to feed the processing plant.

Transport of ore concentrate from the site will occur between 7.00 am to 10.00pm, 7 days per week in accordance with the Project Approval.

3. Noise and Blast Management

Pacific Environment Pty Limited was engaged to prepare the Noise Management Plan for the Woodlawn Mine development which is contained in full as Appendix B while a separate Blast Management Plan was prepared by XCut Consulting Engineers and is contained in full as Appendix C. Key compliance issues relating to noise emissions and blasting are:

- Meet the specified noise emission levels at the nearest occupied residence, Pylara. This residence, despite being owned by Veolia represents the nearest occupied residence. Meeting the criteria at this residence would by default result in compliance with private residences at greater distances.
- Meet the specified overpressure and ground vibration criteria at the nearest residence.

Specific legislative and policy requirements of this NBMP are as follows:

- AS 1055.1, 2, 3-1997: Acoustics – Description and measurement of environmental noise.
- NSW Industrial Noise Policy (INP) (EPA, 2000).

The Blast Management Plan contained in Appendix C also deals with specific issues in relation to Bioreactor as well as the design of the underground blasting systems.

3.1 Noise Management Initiatives

Previous noise impact assessment contained in the EA and the subsequent project modification, suggests that the anticipated noise emissions from the operation both during construction and operation will meet the stated noise and blasting assessment criteria at the nearest privately owned residence, that is, not owned by Veolia.

However, the Project Approval requires that reasonable and feasible noise management initiatives be implemented. The following noise mitigation measures will be implemented:

- The site Environmental Manager will check noise emissions from construction equipment and plant used during the construction period to verify that noise emissions are in line with anticipated levels shown in Table 3.2 of Appendix B.
- Noise checks will be performed on plant and equipment during the commissioning phase to confirm compliance with the noise model. Items found to be in excess of that adopted in the noise model will require attenuation or mitigation to ensure that the estimated overall site emissions comply with the noise assessment criteria contained in the Project Approval.
- 12 monthly checks will also be made on all operating plant and equipment to verify they are in good working order and noise emissions comply with the noise assessment model. This will include attended and unattended noise monitoring.
- Include noise management provisions in all on site work inductions.
- Identify potentially noisy activities during the construction phase and put in place specific control measures as necessary.

- ❒ Ensure blast design and charge weights meet the criteria specified in Section 2.2 or otherwise modified to meet the required assessment criteria.
- ❒ Attended noise monitoring will be conducted at Pylara (shown on Plan 4) during the construction phase on a monthly basis. This will continue for a period of 12 months following commissioning of the new processing plant. The results of this monitoring will be provided in the Annual Review. The monitoring program will be reviewed on an annual basis and if changes to the monitoring program are proposed, approval will be sought from DPE.
- ❒ Provide a mechanism for correcting any non-compliance with the assessment criteria.

Table 5 provides a summary of these measures and their relevant performance indicators and timing.

Table 5: Noise Management Measures at the Woodlawn Mine Project

Measure	Monitoring Method	Timing	Performance Indicator	Responsibility for Implementation
Verify noise emissions from construction plant	Type 2 Noise Meter	Once prior to plant being used on site	Measured level in line with Table 3.2 of Appendix B	Environmental Manager
Periodic checks on operating construction plant and equipment	Inspections	Once per week	Noticeable change in noise output or indication of failed noise attenuation	Environmental Manager
Inductions and training	As per Site Competence and Training	Prior to Permit to Work issued	Acknowledgement of training records	Safety Manager
Identification of noisy activities	Planning and implementation	As required	Compliance with noise and criteria	Mine Manager
Blast design	Planning and implementation	As required	Compliance with overpressure and ground vibration criteria	Mine Manager
Non compliance and corrective action	Weekly Inspection and data review	Weekly	Compliance with criteria	Mine Manager

A negotiated agreement has been prepared between Heron and Veolia for managing construction and operational impacts on the Pylara, Woodlawn and Cowley Hills properties in accordance with previous commitments in the EA. This agreement will cover noise, blasting and dust emissions from the operation. The basis of the agreement will be that Heron seeks to meet the standard assessment criteria contained in the Project Approval for a non company owned receptor but recognises that this may not always be possible. By achieving the criteria at the Pylara properties at a distance of 3.2 km will ensure that the relevant criteria is met at the nearest non-company owned property at a distance of 4.4 km away.

3.2 Blast Management

The explosives utilised during the construction and box cut development would consist of ANFO, emulsion, and high explosive primers and detonators, which are typical for this type of mining activity.

Blasting during construction will occur as required but will be limited to once per day Monday to Friday, excluding public holidays. All blasts will be monitored. Construction blasting will be generally limited to the box cut construction although some may be required for the haul road and ROM pad construction.

The first blast will use a conservative Maximum Instantaneous Charge (MIC) weight in order to verify prevailing ground conditions. The results of monitoring data from this first blast will be used to determine future blast design. In addition to the normal overpressure and ground vibration data, monitoring of the first blast will also include the incidence of fume generation, fly-rock and rock breakage pattern. This data will then be used to determine drill depth and pattern, stemming details, charge decking requirements and MIC.

3.3 Integration with Veolia Operations

Veolia operate the Bioreactor, gas generation plant and Mechanical Biological Treatment (MBT) Plant on site. The Bioreactor consists of trucks entering the site and travelling to the mine void where they discharge containerised waste which is then pushed out with a dozer. The gas generation plant consists of gas converted diesel generators which are run of gas collected from the Bioreactor. The MBT Plant consists of waste screening and mechanical separation processing followed by composting organic residuals. All these activities generate noise and have approval conditions covering noise emissions, controls and monitoring requirements.

As with other monitoring requirements covering surface water, groundwater, dust and atmospheric data, Heron has entered into an agreement with Veolia to share the costs of the combined monitoring program and the resultant data. Some components that are specific to each operation will be borne by the respective operator however the results of all monitoring effort will be available to each party. Noise is a specific monitoring requirement which has a common governing standard, that is, NSW Industrial Noise Policy. The INP allows for the assessment of cumulative noise as well as the determination of individual contributions to a receiver location.

The initial noise monitoring for construction, outlined in Section 5.1 will not need to separately determine the contribution of other noise sources as it is considered that the construction program will be dominant compared with other site activities. However, once operational should there be any exceedence in the noise criteria at Pylara, an assessment will be made of the respective contributions of each site activity.

Management of noise falls under the general provisions of the Veolia-Heron Cooperation Agreement whereby each party will proactively work together to resolve specific issues of noise, dust, odour, water and general site activities that may arise. Each operator recognises the importance of maintaining positive community relationships which are critical to the success of the respective ventures.
Veolia and Heron however do not share the same primary residential receiver locations. The key receptor for Heron's operation is the Pylara Homestead which is owned by Veolia. The monitoring program for noise includes the Pylara Homestead but in the spirit of the Cooperation Agreement, Heron will endeavour to meet the required noise criteria at this location. In doing so will ensure that the relevant criteria is met at the nearest non-company owned property approximately 4.4 km away.

3.4 Future Noise Management Provisions

As required by the Environmental Management Strategy, this NBMP will be reviewed and updated on an annual basis but in particular will be updated prior to the commissioning of the processing plant and off site transport occurs. At this stage, this NBMP will be updated

to include transport arrangements and ongoing noise controls relevant to the operational phase of the project. Specific management issues to be included in the operational NBMP will include, but not limited to the following issues:

- Protection of people and livestock in the surrounding area.
- Road noise implications for the St Andrews Anglican Church.
- The need or otherwise to modify the noise monitoring program undertaken during the construction phase.
- A protocol for determining noise contributions from ongoing operations on site, including the Bioreactor on the Pylara Homestead.
- Compliance procedures to verify that the processing plant constructed under this NBMP can meet the noise assessment criteria listed in the Project Approval.

4. Communication and Reporting

Effective communication with government agencies, the workforce and the community are important features of the overall Environmental Management Strategy for the Woodlawn Mine and therefore a key component of each Environmental Management Plan.

4.1 Community and Government Liaison

Heron is aware of its community obligations and the need to keep lines of communication open. Ongoing government authority and community consultation has been maintained as part of the re-opening of the mine. Heron is committed to continue this consultation work with key government and community stakeholders. The consultation process has, and will continue to include the following stakeholders:

- Woodlawn Bioreactor (Veolia);
- Woodlawn Windfarm (Infigen);
- Woodlawn Community Consultation Committee (CCC);
- NSW Trade and Investment, Resources and Energy;
- Department of Planning and Environment;
- Office of Environment and Heritage;
- Environment Protection Authority;
- Goulburn Mulwaree Shire Council;
- Water NSW (Sydney Catchment Authority);
- Department of Primary Industries - Water (NSW Office of Water); and
- Various community groups and open forums.

The Project Manager and Chief Operating Officer will be responsible for direct contact with government agencies and the community via the CCC.

A presentation was provided by Heron at the Woodlawn CCC meeting on 9th September 2015 which included discussion of the construction program and activities as well as details of the relocation of the mine portal to the western side of the Bioreactor void. The project was again discussed in more detail in the CCC meeting of 16th December 2015. It was agreed that the CCC will be kept informed for the progress of the construction program.

The CCC will be provided environmental monitoring data during the construction program as well as ongoing operations of the mine. This will include noise and blasting data so that the performance of the operation can be assessed.

4.2 Community Complaints

Heron currently maintains a community complaints register that identifies actions required to resolve community issues. The main phone line advertised in the white pages is the designated community complaints line and is answered at all times during hours of operation. The complaints register will record the following details:

- Complainant name and contact details.

- Nature of the complaint (noise, dust, traffic etc).
- Time and date of the complaint.
- Specifics of the complaint.
- Actions taken to resolve the complaint.
- Confirmation that the complaint has been resolved.

In the event that an issue is unresolved, the register will include details of the outstanding issues and any actions that are required. It is recognised that some issues may not have a simple resolution and have resulted in multiple complaints. These form part of the ongoing environmental improvement program for the operation.

All complaints received will be noted at each CCC meeting and recorded. Any additional complaints or issues raised at the CCC will also be documented and actioned in accordance with the current CCC format.

4.3 Public Access to Information

Monitoring data required by the EPL and Project Approval will be reported on the company's web page in accordance with EPA requirements for public disclosure. The data will also be presented to the CCC and interpretation of the data provided if required.

Should an exceedence of any relevant noise or blast criteria, Heron will notify the affected landowners and/ or tenants within 2 weeks. As the nearest two receptors are owned by Veolia, the data will be reported to the Environmental Manager for the Bioreactor. Heron will also report the incident to the Department of Planning and Environment and the Environment Protection Authority as well as provide details of the incident in the Annual Review. The Annual Review will be published on the Heron's web page.

If an owner of privately-owned land considers the project to be exceeding the relevant noise criteria, Heron will facilitate an Independent Review of the data and compliance status. As required in Schedule 5 of the Project Approval, the land owner or tenant may ask the Secretary in writing for an independent review of the impacts of the project on his/her land. Heron will comply with the outcomes of any Independent Review.

5. Verification and Corrective Action

This NBMP forms a component of the overall Environmental Management System for the Woodlawn Mine Project. An essential component of the EMS is verification and implementation of corrective actions as required to achieve the requirements of the Project Approval and Environment Protection Licence.

5.1 Environmental Monitoring

Heron has developed an environmental monitoring program covering both the construction and operational phases. Noise monitoring specifically for the construction phase will include:

- Verification of noise output from mobile plant used during construction.
- Weekly inspections of plant and equipment.
- Monthly attended noise monitoring at Pylara during the construction program.
- Monitoring each blast during the excavation of the box cut.

The initial design of the blast pattern and charge weight will be undertaken by the Blasting Contractor based on anticipated overpressure and ground vibration levels at the property boundary. Following the results from the first blast, the blast design will be confirmed. If there is an exceedence in the criteria, the number of charges per blast will be reduced first, then if exceedences still occur, the charge weight will be reduced.

5.2 Action Trigger Levels

The protocol for determining exceedence of the relevant criteria has been included as a Trigger Action Response Plan or TARP. Noise and blast emission trigger levels relevant to the construction phase are as follows.

- Noise levels of mobile plant and equipment being more than 2 dB(A) above the modelled level contained in Appendix B.
- Blast overpressure being greater than 115 dB(Lin Peak) when measured at the eastern property boundary adjacent to the Pylara property.
- Peak particle velocity greater than 5 mm/sec when measured at the eastern property boundary adjacent to the Pylara property.

In any of the above situations, Heron will undertake the following:

- Not issue a Permit to Work until the plant or equipment meets specified noise levels.
- Investigate blast design and modify charge weight, hole depth, charge delay and number of charges in order to meet the criteria.

Details of the event and corrective actions are to be included in the Annual Review.

5.3 Reporting Procedures

All environmental monitoring requirements specified in EPA licences and approvals are undertaken and the data kept on site. Copies are provided to the Mine Manager, who in consultation with the site Environmental Manager, reviews the data on a monthly basis. A summary of the data is provided to regulatory authorities as required by statutory approvals. Other data collected as part of projects or auditing procedures are reported internally in accordance with the EMS verification procedures.

The Annual Review will be provided to the following agencies:

- NSW Trade and Investment, Resources and Energy;
- Department of Planning and Environment;
- Water NSW;
- Goulburn Mulwaree and Palerang Councils;
- Department of Primary Industry (Water);
- Office of Environment and Heritage;
- NSW Environment Protection Authority; and
- NSW Roads and Maritime Services.

Veolia management will be provided with the results of monitoring data including results obtained for the Pylara homestead. The Annual Review will also be published on Heron's web page to be freely available to the community and any other interested party. Specific to this NBMP, the Annual Review will provide an interpretation and evaluation of the noise and blast monitoring data and report on the effectiveness of the noise management systems on site.

5.4 Environmental Training

The EMS requires that all future employees at Woodlawn receive an appropriate level of environmental awareness training. This training will be tailored to suite the mine and covers the following levels:

- Managers (including Electrical, Mechanical, Surface and Underground Managers and Supervisors)
- Surface workforce
- Underground workforce
- Induction level for visitors.

Competency based training will be provided to key personnel. This training will cover environmental legislation, performance criteria, details of specific pollution control system for the site and emergency planning.

General surface workforce will be trained in specific site procedures and management of pollution control systems while all employees are made aware of the Woodlawn Mine's environmental obligations and statutory requirements.

For the construction program, the training will include:

- Recognition of the need to minimise noise generating activities;

- obligations of all employees and contractors on site to minimise noise;
- identification of noisy activities and the need to implement noise controls as necessary;
- recognising the need to inspect plant and equipment to ensure operability of standard noise mitigation equipment such as mufflers, exhaust manifolds and engine guards;
- lines of communication to report activities that may be causing excessive noise.

5.5 Management Review

The overall EMS has provisions for management review to identify any weaknesses or out of date procedures. The aim is to maintain the EMS and component Management Plans in line with current industry and Australian standards and changes to environmental legislation.

This NBMP will be reviewed at the end of the construction program and management practices updated if necessary prior to issuing the NBMP covering the operational phase of the mine. The operational phase NBMP will include the results of noise compliance checks of processing equipment, specifically the crushing circuits undertaken during commissioning.

5.6 Continuous Improvements

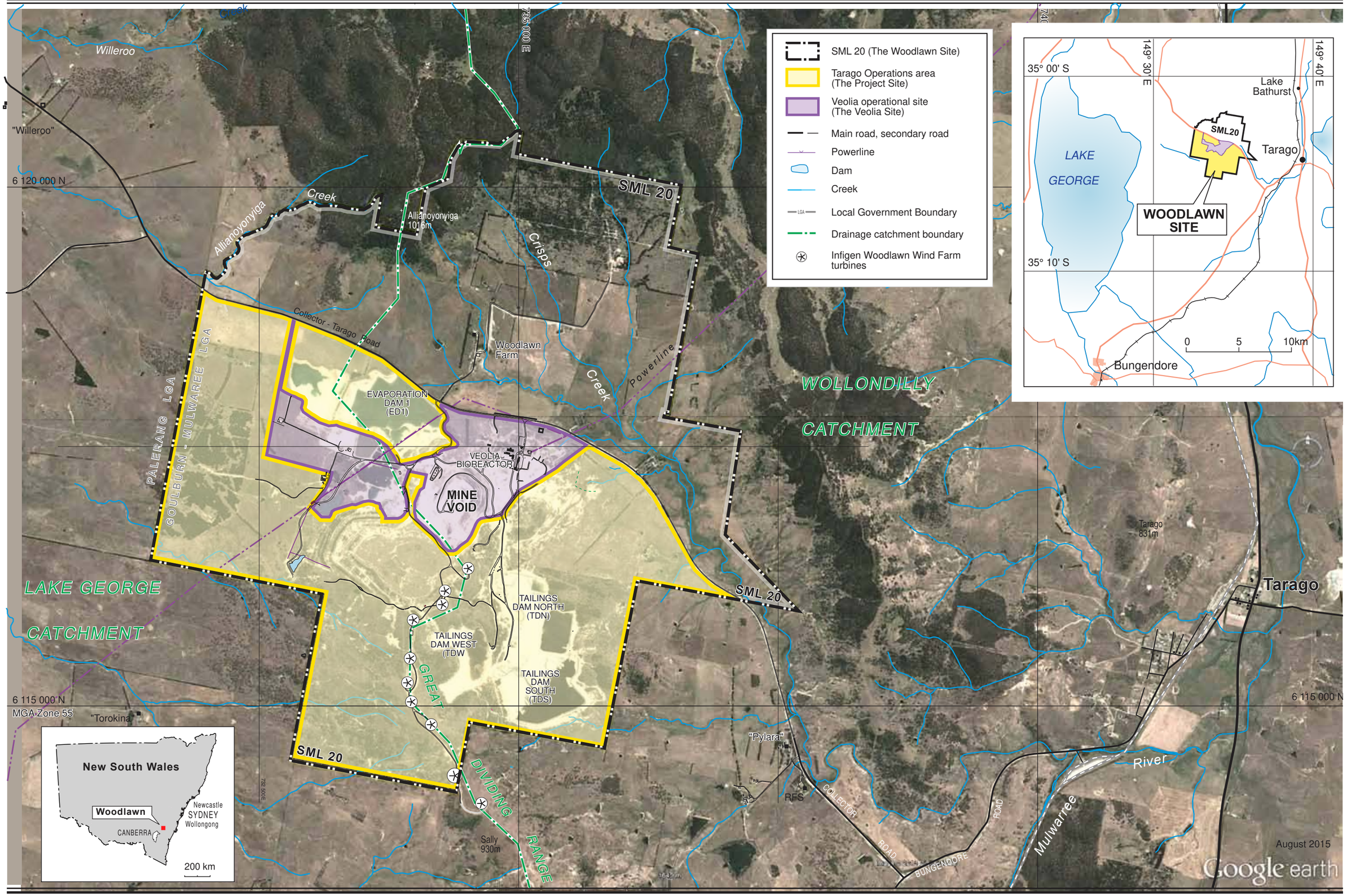
A key component of the EMS is the commitment to continuous improvement. This will be measured by formal and informal criteria. Formal measures will include internal and external inspection and action plans. These reports will be used to establish trends in non-compliance and environmental performance. The level of non-compliance with both statutory and company standards will then be summarised in the Annual Review.

The auditing will also provide an assessment of housekeeping and general environmental awareness of the operation, how the site has adopted new technology, maintenance of pollution control systems, preventative actions, community consultation and responded to incidents and corrective action plans. This information will be used to provide a general trend in environmental performance.

The key measure of continuous improvement in noise control will be the results of noise monitoring and the level of noise complaints. It is recognised however that the construction phase is potentially the highest noise generating phase of the project. To achieve the objective of continuous improvement, the noise data collected during the construction phase will be compared with background noise levels obtained during the Environmental Assessment. Should an increasing trend occur that is not related to construction intensity be observed, then corrective action will be implemented.

This NBMP recognises that noise is a general Occupational Health and Safety consideration and excessive noise generated on site may result in the need for hearing protection in some instances. It is also recognised that there are industrial neighbours nearby which may be impacted during construction including Veolia's office and administration building and Veolia owned residential dwellings. Achieving the stated objectives and criteria will alleviate the potential impacts on these receptors.

Appendix A - Figures

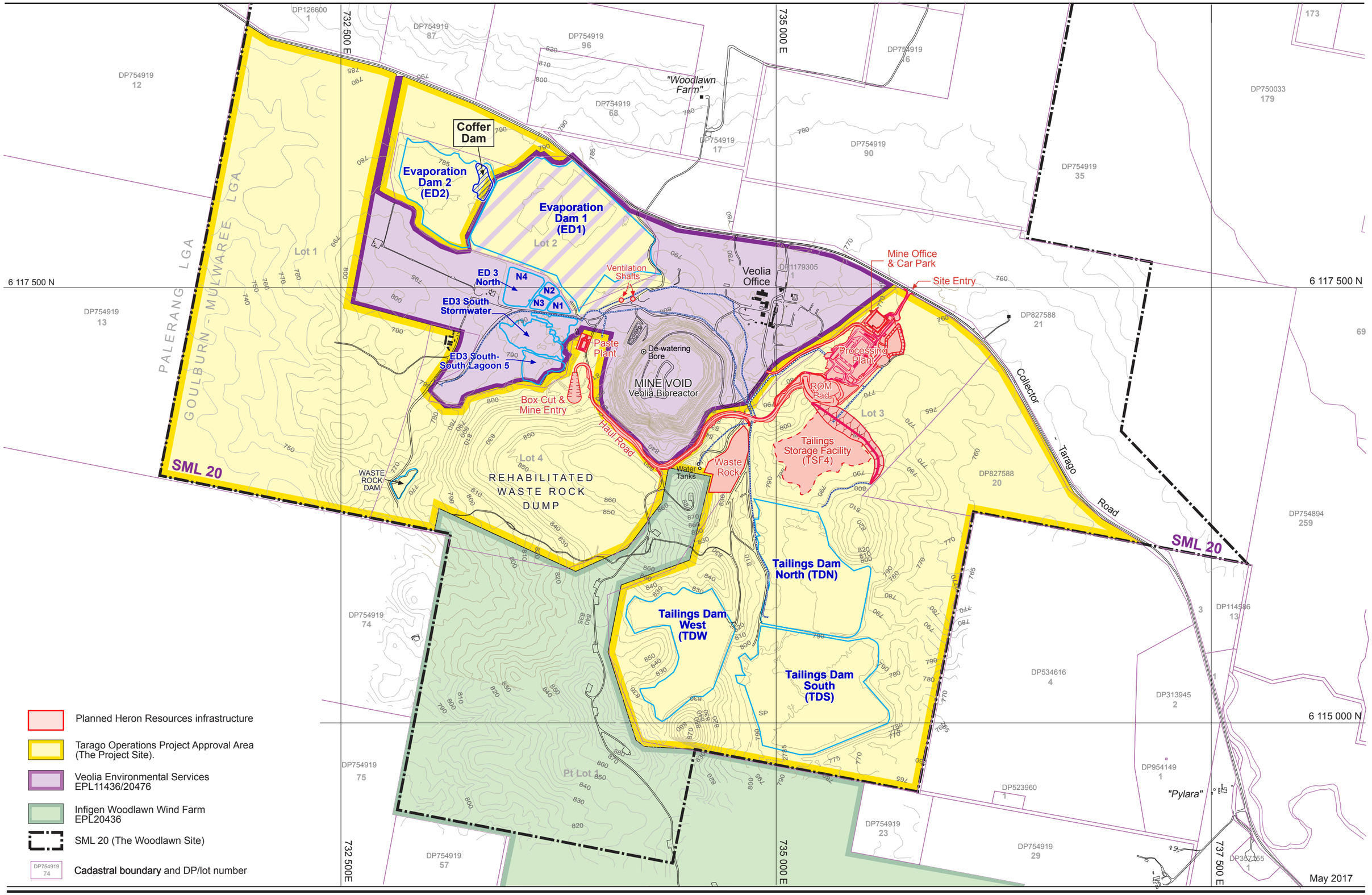


Topographic map source : Lake Bathurst 8827-4-N

0 500 1000 1500 2000 metres

N

Plan 1
Woodlawn Site - Locality Plan



PLAN 2
Woodlawn Mine - Site Details

735000E

735500E

736000E

6117000N

6117000N

VEOLIA SITE

Light Vehicle Access Road

Temporary sediment pond during construction only

CURRAWANG - TARAGO ROAD

Office and Change House Area

Sewage Treatment Plant

Site Runoff Dam

Process Water Dam

WORKSHOPS

PROCESSING AREA

Light Vehicle Access Road

ABOVE GROUND PIPELINES

Existing Pond

ROM PAD

PIPELINE

ABOVE GROUND PIPELINES

HAUL ROAD

Tailings Storage Facility (TSF4)

WATER MANAGEMENT

- Clean water diversion channel
- Site water flow
- Site drains
- Natural drainage
- Rock protection
- Planned dam
- Existing dam

July 2017

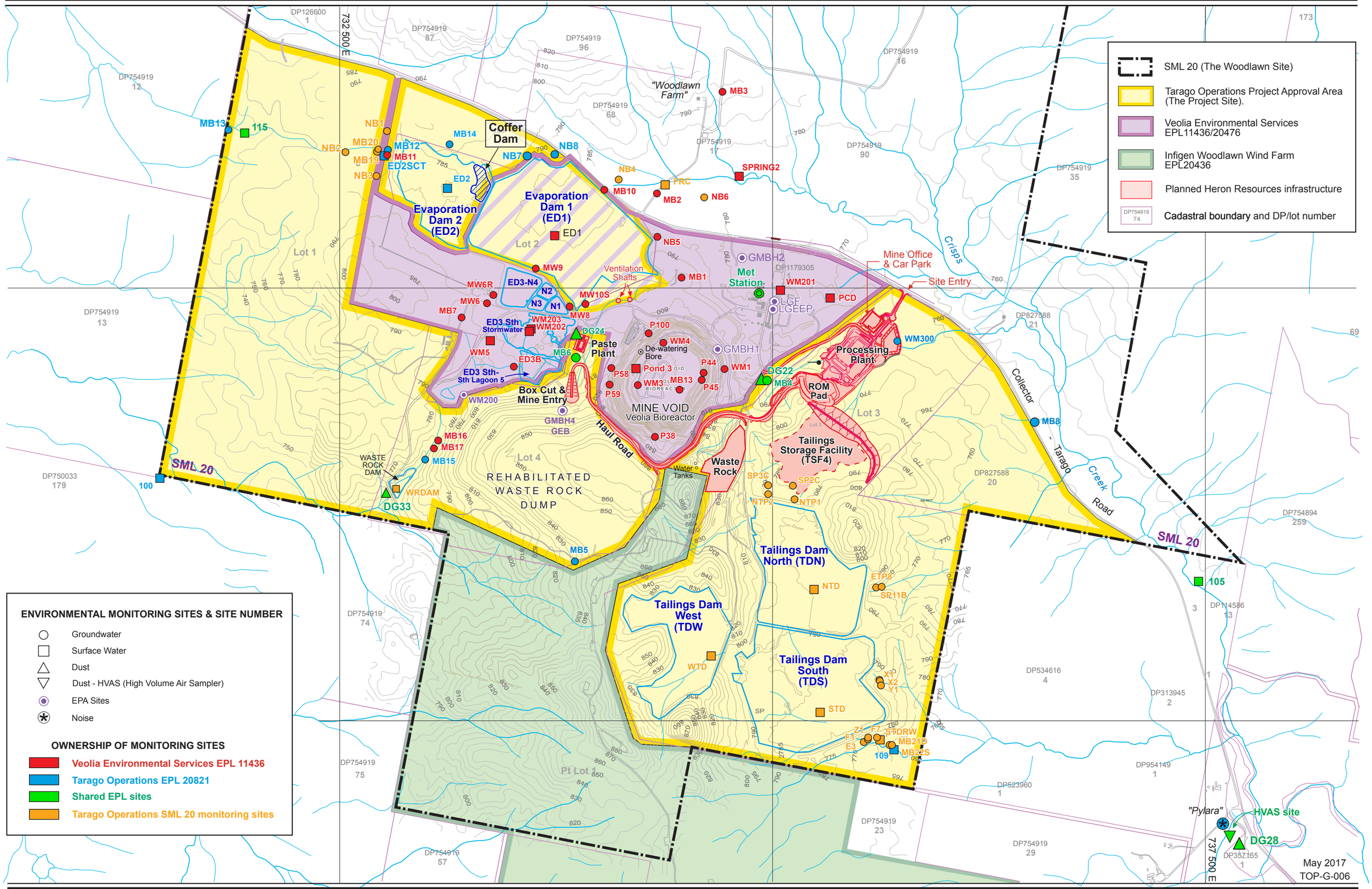
0 50 100 200 metres

Scale 1:3000 at A3

N

PLAN 3

Woodlawn Processing Plant - General Arrangement


SML 20 (The Woodlawn Site)
Tarago Operations Project Approval Area (The Project Site).
Veolia Environmental Services EPL11436/20476
Infigen Woodlawn Wind Farm EPL20436
Planned Heron Resources infrastructure
Cadastral boundary and DP/lot number
ENVIRONMENTAL MONITORING SITES & SITE NUMBER
Groundwater
Surface Water
Dust
Dust - HVAS (High Volume Air Sampler)
EPA Sites
Noise
OWNERSHIP OF MONITORING SITES
Veolia Environmental Services EPL 11436
Tarago Operations EPL 20821
Shared EPL sites
Tarago Operations SML 20 monitoring sites
Coffer Dam
Evaporation Dam 1 (ED1)
Evaporation Dam 2 (ED2)
ED3 Sth Stormwater
ED3 Sth- Sth Lagoon 5
Paste Plant
Box Cut & Mine Entry
MINE VOID
Veolia Bioreactor
Haul Road
REHABILITATED WASTE ROCK DUMP
WASTE ROCK DAM
Waste Rock
Water Tanks
Tailings Storage Facility (TSF4)
Tailings Dam North (TDN)
Tailings Dam West (TDW
Tailings Dam South (TDS)
Processing Plant
ROM Pad
Met Station
Mine Office & Car Park
Site Entry
Ventilation Shafts
De-watering Bore
LGF LGEEP
"Woodlawn Farm"
"Pylara"
HVAS site
Tarago - Braidwood Road
Crisps Creek Road
Collector
Lot 1
Lot 2
Lot 3
Lot 4
Pt Lot 1
732 500 E
737 500 E
Datum : GDA MGA Zone 55
0 500 1000 m
N
May 2017
TOP-G-006
PLAN 4
Woodlawn Project
Environmental Monitoring Sites

Appendix B – Noise Management Plan

Pacific Environment Limited

Consulting • Technologies • Monitoring • Toxicology

Report

WOODLAWN MINE PROJECT NOISE MANAGEMENT PLAN

HERON RESOURCES

Job ID. 09298

13 JANUARY 2015

PROJECT NAME:	WOODLAWN MINE PROJECT NOISE MANAGEMENT PLAN
JOB ID:	09298
DOCUMENT CONTROL NUMBER	ACO-NW-002-09298
PREPARED FOR:	Heron Resources
APPROVED FOR RELEASE BY:	A. McKenzie
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CONTENTS

1 INTRODUCTION

1.1 Background

The Woodlawn Mine Project (WMP) is located approximately 50km south of Goulburn in the NSW Southern Highlands. The location of the mine and sensitive receivers nearby the site are shown in **Figure 1.1**.

On 4 July 2014, the Department of Planning and Environment, granted Project Approval to TriAusMin Limited for the Woodlawn Mine Project (the Project). The Woodlawn Project will be developed by Tarago Operations Pty Limited, a wholly owned subsidiary of Heron Resources Limited which merged with TriAusMin Limited, the original proponent for the project. The Project Approval Condition 7 of Schedule 4 requires the preparation of a Noise Management Plan (NMP).

The NMP provides a working document for day-to-day management of the site which will assist with ensuring the operation complies with approval requirements. The plan covers all aspects of noise management on site including: monitoring, complaints handling, performance indicators, training, roles and responsibilities and the recommended revision procedure.

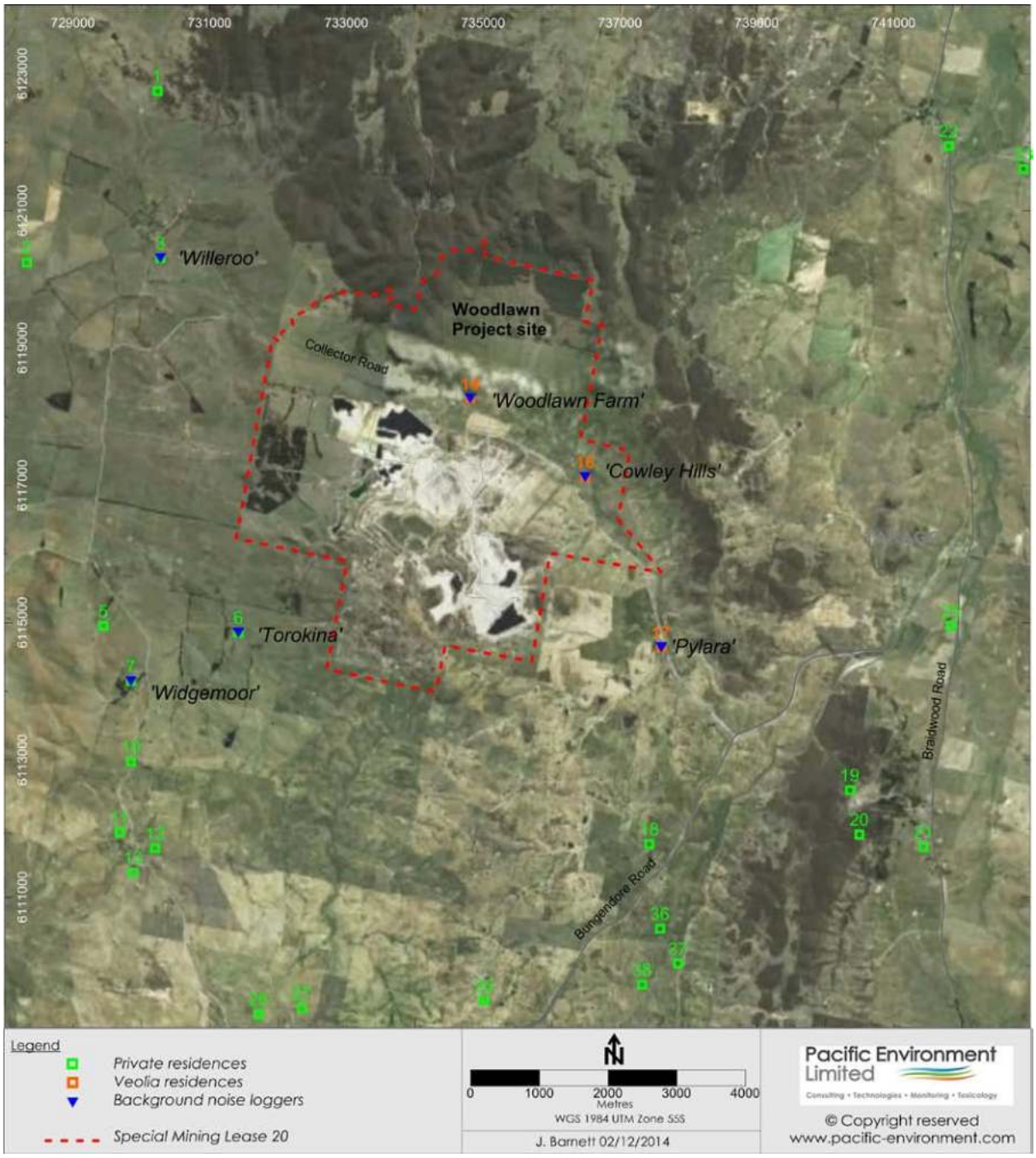

Figure 1.1: Project Site and Sensitive Receptors

1.2 Objectives of the Management Plan

This NMP describes strategies for managing noise emissions for the Project. The NMP forms part of the Environmental Management Strategy for the Project and has been developed in accordance with the approval conditions, as listed in **Table 1.1**.

Table 1.1: Woodlawn Mine Project Approval Conditions – Operating Conditions

Schedule 4, Condition 6 Operating Conditions	Relevant Section of NMP
The Proponent shall;	
implement best management practice, including all reasonable and feasible noise mitigation measures, to minimise the construction, operational, low frequency and road noise from the project, to the satisfaction of the Director-General.	**Section 4**

The requirements for the NMP are outlined in **Table 1.2**.

Table 1.2: Woodlawn Mine Project Approval Conditions – Noise Management Plan

Schedule 4, Condition 7 Noise Management Plan	Relevant Section of NMP
The Proponent shall prepare and implement a Noise Management Plan for the project to the satisfaction of the Director-General. The plan must:	
(a) be prepared in consultation with the EPA, and submitted to the Director-General for approval prior to commencing construction on the site;	**Whole Report**
(b) describe the measures that would be implemented to minimise noise generated by the project, including road noise at the St Andrews Anglican Church;	**Sections 4**
(c) include a monitoring program that: • • uses attended monitoring to evaluate the performance of the project; • • includes a protocol for determining exceedances of the criteria identified in Table 3; • • evaluates and reports on the effectiveness of the noise management system on site; and	**Section 5**
(d) describe how noise management and monitoring on the site would be integrated with the Woodlawn Landfill.	**Section 6**

Additional requirements for the NMP are outlined in Schedule 6 Condition 3 and are listed in **Table 1.3**.

Table 1.3: Woodlawn Mine Project Approval Conditions – Management Plan Requirements

Schedule 6, Condition 3 – Management Plan Requirements	Relevant Section of NMP
The Proponent shall ensure that the management plans required under this approval are prepared in accordance with any relevant guidelines, and include:	
(a) a description of: • the relevant statutory requirements (including any relevant approval, licence or lease conditions); • any relevant limits or performance measures/criteria; • the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;	**Section 2 and Section 4**
(b) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits or performance measures/criteria;	**Section 4**
(c) a program to monitor and report on the: • impacts and environmental performance of the project; • effectiveness of any management measures (see b above);	**Section 5 and Section 6**
(d) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;	**Section 6 and Section 7**
(e) a protocol for managing and reporting any: • incidents and complaints; • non-compliance with statutory requirements a exceedances of the impact assessment criteria and/or performance criteria; and	**Section 7 and Section 8**
(f) a protocol of periodic review of the plan.	**Section 8**

The conditions of approval include requirements for noise compliance assessment. Conditions 3 and 4 of Appendix 5 Noise Compliance Assessment are detailed **Table 1.4**.

Table 1.4: Woodlawn Mine Project Approval Conditions – Noise Compliance Assessment

Appendix 5 – Noise Compliance Assessment	Relevant Section of NMP
Compliance Monitoring	
3. Unless otherwise agreed with the Director-General, monthly attended monitoring is to be used to evaluate compliance with the relevant conditions of this approval.	**Section 5 and Section 6**
4. Unless otherwise agreed with the Director-General, this monitoring is to be carried out in accordance with the relevant requirements for reviewing performance set out in the NSW Industrial Noise Policy (as amended from time to time), in particular the requirements relating to: (a) monitoring locations for the collection of representative noise data; (b) meteorological conditions during which collection of noise data is not appropriate; (c) equipment used to collect noise data, and conformity with Australian Standards relevant to such equipment; and (d) modifications to noise data collected, including for the exclusion of extraneous noise and/or penalties for modifying factors apart from adjustments for duration.	**Section 5 and Section 6**

The conditions of approval include requirements for notification of Landowners of noise monitoring results showing an exceedance Conditions 1 of Schedule 5 Additional Procedures are detailed in **Table 1.5**.

Table 1.5: Woodlawn Mine Project Approval Conditions – Noise Compliance Assessment

Schedule 5 Condition 1 (a) – Notification of Landowners	Relevant Section of NMP
Within two weeks of obtaining monitoring results showing:	
(a) an exceedence of any relevant noise criteria in Schedule 4, the Proponent shall notify affected landowners and/ or tenants in writing of the exceedence, and provide regular monitoring results to each of these affected parties until the project is again complying with the relevant criteria.	**Section 8**

2 NOISE CRITERIA

The management plan has been prepared with consideration to the following legislation and standards:

- AS 1055.1,2,3-1997: Acoustics – Description and measurement of environmental noise.
- NSW Industrial Noise Policy (INP) (EPA, 2000).

2.1 Noise Criteria

In accordance with Schedule 4, Condition 5 of the Project Approval, The Proponent shall ensure that the noise generated by the project does not exceed the criteria at any residence on privately-owned land. The Criteria are reproduced in **Table 2.1**.

Table 2.1: Noise Criteria dB(A)

Receivers	Day/ Evening /Night ($L_{Aeq\ 15\ minute}$)	Night (L_{AMax})
All residential receivers	35	45

Note: After the first review of any EPL granted for this project under Section 78 of the POEO Act, nothing in this approval prevents the EPA from imposing stricter noise limits on the mining operations on site under the EPL

Meteorological conditions under which the noise conditions apply are included in Appendix 5 Condition 1 and 2 of the Project Approval. These conditions are reproduced in **Table 2.2**.

Table 2.2: Applicable Meteorological Conditions

Development Conditions Requirement – Management Plan Requirements
1. The noise criteria in Table 3 of the conditions are to apply under all meteorological conditions except the following:
(a) during periods of rain or hail; (b) average wind speed at microphone height exceeds 5 m/s; (c) wind speeds greater than 3 m/s measured at 10 m above ground level; or (d) temperature inversion conditions greater than 3°C/100 m.
2. Except for wind speed at microphone height, the data to be used for determining meteorological conditions shall be that recorded by the meteorological station located on the site.

These criteria do not apply if the Proponent has an agreement with the relevant owner(s) to exceed the criteria, and the Proponent has advised the Department of Planning in writing of the terms of this agreement (Schedule 4 Condition 5).

3 PROJECT OVERVIEW

The construction of the Woodlawn Mine will be staged. The first stage covers the construction of the box cut, decline development to access the underground workings, ventilation facilities, installation of dewatering facilities, drill drives and exploration drilling. Surface facilities will include temporary offices, workshop and hardstand areas. Stage 1 also includes rehabilitation of the initial construction area and portal surrounds.

The second stage of construction will include expansion of the initial hardstand area and facilities as well as the construction of the waste rock emplacement. Subsequent stages will involve development of the permanent processing plant, additional tailings dam, truck loading facilities and permanent access road.

Once operational, the Woodlawn Mine will consists of two components:

- Recommencement of the underground mine previously abandoned by Denehurst Pty Limited. The extent and life of the underground component will be governed by the remaining resource and includes additional drilling and resource definition studies.
- The re-treatment of approximately 11 million tonnes (Mt) of tailings material stored within three existing on site tailings dams in a purpose built processing facility. Tailings are to be processed at a rate of approximately 1.5 million tonnes per annum (tpa) over a period of approximately 8 years, overlapping with underground mine operations. The retreatment process will produce nominally 50,000 to 90,000 tonnes of concentrate per annum.

Combined production from the underground and tailings dam retreatment project is anticipated to be up to 150,000 tpa of combined zinc, copper and lead concentrates. As the project will be staged, so too will be need for surface infrastructure. The facilities will be located in a separate area to the original Woodlawn Mine site which is currently operated by Veolia.

The Project Plan shown in **Figure 3.1** is indicative only and shows the general location of the new surface facilities area to be operated by Heron Resources. The exact location of the surface facilities is not material in the establishment of appropriate Noise Management Systems to be employed during construction or later operations. Updated project plans are contained in the Construction Management Plan.

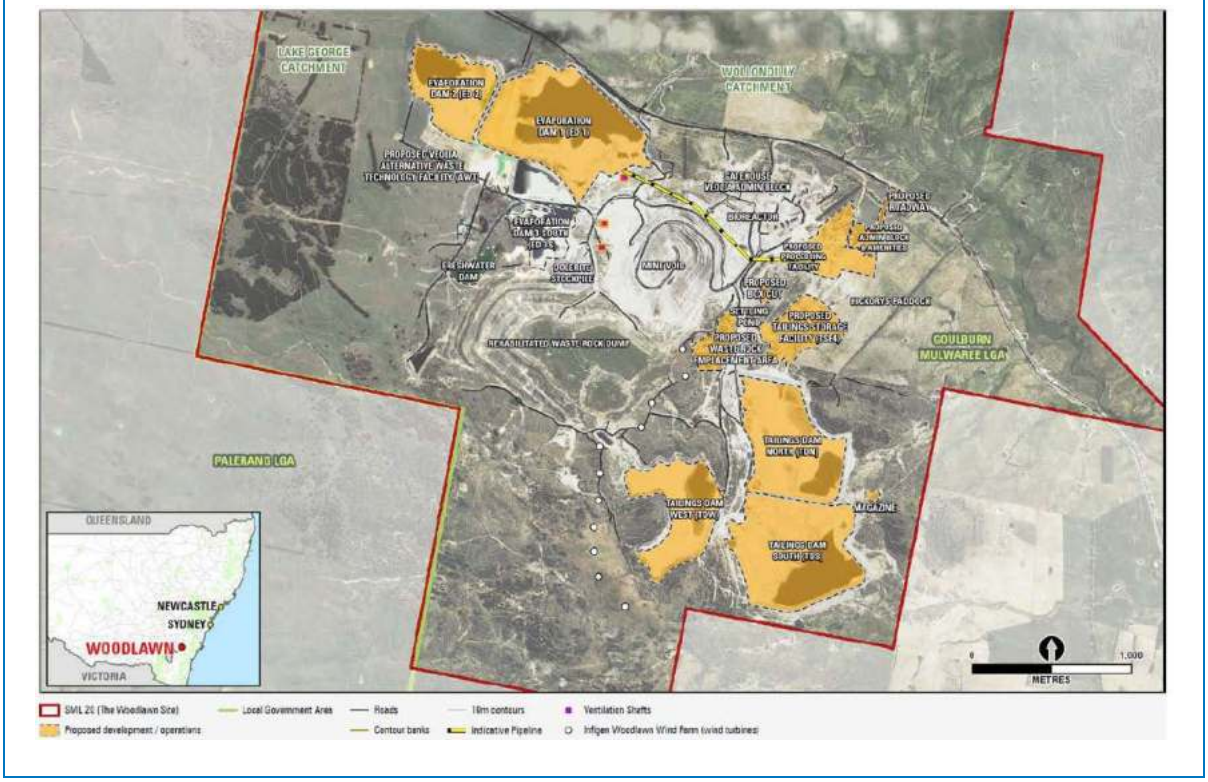

Figure 3.1: Project Plan

3.1 Prevailing Ambient Noise Environment and Noise Monitoring

Unattended noise monitoring was undertaken at 5 locations during 2008 and 2011.

The monitoring locations are the closest residential noise receivers to the site, and are situated north, south east, south west and north west of the site. Three of these properties, Woodlawn Farm, Cowley Hills and Pylara are currently occupied by Veolia employees and the remainder are privately owned and occupied. A summary of the rating background levels at the monitoring locations is presented in **Table 3.1**: The background locations are also shown in **Figure 1.1**.

Table 3.1: Rating Background Noise Levels at the Adjacent Residential Areas

Location	Approximate distance from Project Site[1] (m)	Day RBL, dB(A)	Evening RBL, dB(A)	Night RBL, dB(A)
Woodlawn Farm[2]	1400	33	35	30[3]
Cowley Hills	700	30[3]	30[3]	30[3]
Pylara	3200	30[3]	30[3]	30[3]
Willeroo	6000	30[3]	30[3]	30[3]
Widgemoor	6000	30[3]	30[3]	30[3]
Torokina	4400	30[4]	30[4]	30[3]

Notes: 1 Distance from admin block / processing plant

2 Wilkinson Murray survey – 15 Feb 2008 to 26 Feb 2008

3 RBL set to the minimum recommended level of 30dB(A) where the background noise levels is low, in accordance with INP procedures

4 RBL levels for Torokina derived from measurements at Widgemoor which is in close proximity to this location. Widgemoor is further away from industrial noise sources in the area compared with Torokina and will provide a conservative estimate of background noise levels.

3.2 Meteorology

Meteorological conditions were collected at the Veolia owned meteorological weather station located at Woodlawn. An assessment of a year of meteorological was undertaken as part of the project Noise and Vibration Assessment (PAE Holmes, 2012).

Based on the statistical analysis of the data, winds blowing from the site to receivers are not a feature of the area (i.e. occurring more than 30% of the time) during day and evening periods. During night time, winds blowing from the site to Torokina and Widgemoor are a feature of the area during Summer and Autumn, with occurrences exceeding 30% of the time. Noise modelling therefore considers winds of speeds up to 3m/s from site to Torokina and Widgemoor.

Temperature inversions of Pasquill Stability Class F category strength are found to occur on 27.5% of winter nights and therefore are not considered a feature of the area in accordance with the NSW INP.

3.3 Noise Sources

3.3.1 Construction Noise

A construction noise assessment has been undertaken for the project. It is intended that construction works will be undertaken during the hours of 7 am – 7 pm Monday to Sunday. The construction of the project infrastructure will occur in two stages as described below.

The Stage 1 construction phase will involve development of the box cut and decline to access the underground workings. This stage will involve emplacing material excavated from the drift in a designated area as well as establishing temporary demountable style structures for the contractor. A temporary access road will be constructed.

Stage 2 will progressively occur following the completion of Stage 1. Stage 2 will include the main processing area, further expansion of the initial hardstand area, permanent administration and laboratory facility and the waste rock emplacement. The final components of the Stage 2 construction phase will include the development of the additional tailings dam (TSF 4), tailings retreatment system, materials handling infrastructure and truck loading facilities.

Table 3.2 presents an outline of construction equipment and typical sound power levels for the construction stages.

Table 3.2: Construction Noise Source Sound Power (SWL)

Construction Works and Plant	Sound Power Level, dB(A)
Stage 1 - Construction of boxcut, portal and access decline	
Excavator	110
Haul Trucks (2x30t)	105
Drill Rig	114
Ventilation Fan	95
Haul Trucks (2x50t)	117
Grader	109
Water Cart	111
Stage 2 - Construction of infrastructure, processing facilities and offices	
Dozer (1xD10)	113
Dozer (2xD8)	110
Front End Loader (x2)	111
Track Excavator	112
Haul Trucks (2x30t)	105
Bobcat/ small Backhoe (x2)	100
Roller	100
Grader	109
Water Cart	111
Concrete Truck and Pump	109
Truck Mounted Crane	107
Generators/ Compressors	95
Crane (50t)	105
Stage 2 - Tailings storage facility	
CAT825 Compactor	110
Smooth Drum Roller	100
Track Excavator	112
Haul Trucks (2x30t)	105
Grader	109
Water Cart	111

Notes: Typical sound power levels used in the noise modelling are also shown based on measured levels, levels presented in previous studies and published noise levels from the UK's Department of Environment, Food and Rural Affairs (DEFRA 2008).

3.3.2 Operational Noise

. When operational, the Woodlawn Mine will operate 24hrs a day, seven days a week. Therefore, operational noise impacts may occur during the day, evening and night period.

Table 3.3 presents a list of plant and infrastructure used in the operational phase and typical sound power levels.

Table 3.3: Operational Noise Source Sound Power Levels (SWL)

Operational Plant	Sound Power Level, dB(A)
Infrastructure, processing facilities and mobile plant	
Haul Truck (x2)[1]	117
B-Double	105
Grader	109
Water Cart	111
Front End Loader	115
Conveyors (x10)	82 per metre
Conveyor Drive (x7)	93
Crusher (x2)	120
Bins	110
Ball Mill	105
Vibrating Screens	113
Vent Fan (400kW)	118
Paste Plant	113
Concrete Batch Plant	113
Concentrator Shed	101[2]
ISA mills	94[2]
Flotation	90[2]

Notes: 1. up to 4 haul trucks are in the fleet for hauling ore or waste rock associated with the WUP. Only 16 loads will be required during daytime and the trucks would not be operating continuously. The assessment assumed one haul truck for the ore to ROM route and one haul truck for the waste rock to dump route in a worst case 15 minute period.

2. calculated breakout noise level assuming internal level of 85 dB(A) for ISA mills and flotation and an FEL operating within the Concentrator Shed.

3.3.3 Transportation Noise

Concentrate will not be transported during the Stage 1 construction phase however minor consumables will be delivered to site. Stage 2 construction will also include delivery of plant and processing equipment. Once operational the Project will generate additional traffic on the surrounding public road network due to employee cars movements accessing the site, and heavy vehicles for concentrate haulage and deliveries.

Roads providing access to the Project include Collector Road, Bungendore Road, Braidwood Road, Tarago Road and Molonglo Street.

The site generated traffic is typically split into two routes; the southern route is via Bungendore and travels south from Collector Road down Bungendore Road, Tarago Road and Molonglo Street to the highway. The northern route, via Goulburn travels north from Collector Road on Bungendore Road and Braidwood Road towards the highway.

The construction working hours are proposed to be between 7 am and 7 pm. The majority of construction employees are expected to arrive at the site between 6 am and 7 am and leave the site

between 7 pm and 8 pm. During peak construction period, up to 200 employees are expected per day.

The operations working hours are 24 hours a day for 7 days a week. The anticipated day shift is 7 am to 7 pm and the night shift is 7 pm to 7 am. The majority of operational employees are expected to arrive at the site between 6 am and 7 am and leave the site between 7 pm and 8 pm. During peak operation periods, up to 140 employees are expected per day.

3.4 Noise and Vibration Assessment

In 2012, Pacific Environment (formerly PAEHolmes) completed a Noise and Vibration Assessment (NVA) for the Woodlawn Mine Project (PAEHolmes, 2012). The assessment investigated potential noise and vibration impacts from the project on surrounding sensitive receivers.

Acoustic modelling was undertaken to assess potential noise impacts associated with construction and operational phases. Traffic noise impacts were also assessed.

3.4.1 Construction

Noise generated during the construction phase is expected to comply at all receivers except Cowley Hills. At Cowley Hills, a marginal 1 dB(A) exceedance is predicted for construction works during standard construction hours and a 6 dB(A) exceedance is predicted for construction outside of standard construction hours. A 1dB(A) difference in noise level is barely perceptible to the human ear. Cowley Hills is currently occupied by Veolia employees and an agreement between Heron Resources and Veolia has been made regarding managing noise impacts for construction works outside of standard hours. No construction noise impact is predicted for any privately owned and occupied properties and the Veolia administration building.

3.4.2 Operation

Noise generated during the operational phase is expected to comply at all receivers except Woodlawn Farm where a marginal 2 dB(A) exceedance is predicted and Cowley Hills where a significant 9 dB(A) exceedance is predicted. A 2 dB(A) difference in noise level is barely audible to the human ear. Cowley Hills is currently occupied by Veolia employees and an agreement between Heron Resources and Veolia has been made for managing noise impacts during the operational phase. No operational noise impact is predicted for any privately owned and occupied properties.

Cumulative noise levels from operation of the Woodlawn landfill were found to be within the daytime, evening, and night time amenity criterion at the nearest privately owned residences.

3.4.3 Traffic Noise

Traffic noise impacts during construction were assessed and found to comply with the RNP criteria. The assessment of operational impacts also found that the project complies with the RNP criteria under all conditions. The assessment found that at full production there was a potential exceedance at St Andrews Anglican Church, Tarago due to the increased flow over a one hour period caused by the employee shift change over between 6.00am and 7.00am. The criteria for places of worship apply only during periods of use. Current church services are scheduled for 9.00am on Sundays and therefore would not trigger an exceedence. Church services are advertised in the Tarago Times newspaper and these will be monitored to determine if there is the potential for conflicts with peak traffic period in the future. Cumulative road traffic noise incorporating traffic movements from surrounding industrial facilities have been assessed. An increase in noise levels of 2 dB or less is expected when comparing cumulative road traffic noise levels and the Project traffic noise only for the majority of affected roads. Collector Road is expected to experience an increase greater than 2 dB, however the offset distance from the road to receivers is such that compliance with the RNP criteria is expected at these properties.

4 NOISE MANAGEMENT MEASURES

Noise management and mitigation measures to be implemented for construction, operation and road traffic are detailed in the following sections.

4.1 Construction noise management

The construction noise assessment did not identify significant noise impacts at any of the privately owned residences in the vicinity of the project. Where the Veolia owned dwelling 'Cowley Hills' is occupied, night time construction activity has the potential to exceed night time construction noise criteria. As construction activity will be undertaken during the day time construction period, night time noise exceedances will be avoided. No specific mitigation measures are therefore considered necessary for either Stage 1 or Stage 2 construction phases. The site Environmental Manager will check noise emissions from construction equipment and plant used in the Stage 1 and Stage 2 construction period to verify that noise emissions are in line with anticipated levels shown in Table 3.2. Periodic checks will also be made on all operating plant and equipment to verify they are in good working order.

4.2 Operational noise management

The NVA did not identify any exceedances of operational noise goals at privately owned residences during neutral weather conditions. During noise enhancing north east winds, noise levels at the privately owned residential receiver 'Torokina' was predicted at the criteria level. To ensure that operational noise levels are within the noise criteria during all operating periods the following mitigation measures would be implemented:

- Plant and Equipment selection to consider plant sound power levels adopted in the Project NVA, as listed in **Table 3.3**.
- During site inductions all operators are to be educated as to good noise management practice.
- Identify equipment which is generating excess noise eg: damaged exhaust mufflers, noisy bearings, squeaky conveyor rollers etc.
- Minimising impact noise such as drop heights and metal on metal impacts.
- Undertaking noisy activities outside noise sensitive periods, eg: early morning, evening and night time, especially where operating nearer to sensitive residences.
- Operate mobile and stationary equipment with covers in place.
- Use of broad band "quacker" reversing alarms as opposed to (annoying) tonal beepers on mobile plant.
- Regularly inspect and maintain equipment to ensure it is in good working order.
- Engineering noise controls such as noise barriers and acoustic enclosures to be implemented as required.
- Periodic noise monitoring at the site boundary and nearest dwelling locations.
- Operate equipment in accordance with manufacturer's instructions.

4.3 Transport Noise Management

The Project NVA did not predict road transport noise impacts above the road noise criteria at private residences. A potential exceedance was identified at the St Andrews Anglican Church, Tarago during the morning 6 am to 7 am shift change period however as current church services are at 9 am on Sundays, no exceedences should occur.

The following general noise management measures would be applied to minimise road noise during the operational phase.

- Instruct employees to limit engine revs and speed in residential areas.
- Instruct truck drivers to limit engine revving, exhaust brakes and heavy braking when on the public road network especially when accessing the site via Tarago.
- Instruct truck drivers to maintain best operational practices at all times; and
- Keep truck drivers informed of designated vehicle routes, parking locations, acceptable delivery hours or other relevant practices (for example, minimising the use of engine brakes).

4.4 Noise Management Summary

Table 4.1 provides a summary of these measures and their relevant performance indicators and timing.

Table 4.1: Noise Management Measures at the Woodlawn Mine Project

Measure	Monitoring Method	Timing	Performance Indicator	Responsibility for Implementation
Construction and Operations				
Construction hours	General inspection	Ongoing as required	N/A	Construction Manager
Training on noise minimisation	General inspections	During inductions, ongoing during toolbox talks as required	N/A	Environment Manager
Well maintained plant and equipment	General inspection	Ongoing as required	Excessively noisy plant	Construction Manager Operators
Construction equipment noise levels	Field check of noise levels on suspected noisy equipment	As required	SWL's, Refer **Table 3.2** this plan.	Environment Manger
Noise monitoring and compliance check	Noise monitoring	Monthly	No exceedance of project noise criteria	Environment Manger
Operational plant and equipment noise levels (SWL)	Confirm manufacturers noise levels, testing as required	During procurement and commissioning	SWL's, Refer **Table 3.2** this plan.	Manager Mine Engineering
Engineering noise controls	Noise monitoring	Monthly	Reduced noise level	Manager Mine Engineering
Road transport				
Traffic Noise at St Andrews Church	Consultation	Project Commencement	Noise levels below RNP goals when in use	Environment Manager
Staff training on transport noise minimisation	During inductions	During inductions	N/A	Environment Manager
Truck driver education	During inductions	During inductions	Community complaints	Environment Manager

5 NOISE MONITORING PROGRAM

Condition 7 of Schedule 4 of the Woodlawn Mine Project Approval requires the Noise Management Plan to include a program that uses attended monitoring to evaluate the performance of the project, a protocol for determining exceedences of the criteria and evaluates the effectiveness of the noise management system on site. The following noise monitoring program satisfies this requirement and has been staged to allow progressive implementation in line with the proposed development and construction program.

5.1 Attended Noise Monitoring

For the Stage 1 and 2 construction program, noise emissions from mobile plant and equipment will be measured to ensure compliance with the levels specified in **Table 3.2**. Plant at or below these levels will be allowed to operate on site during the construction stages.

Once fully operational, operator-attended short-term noise monitoring will be conducted as campaigns at the locations listed in **Table 5.1** to measure noise levels from ambient noise sources and Woodlawn Mine operations over a 15 minute measurement period. The operator will measure noise emissions and estimate the noise contribution from the Project site operation for the day, evening and night time periods. The main aim of attended noise monitoring is to determine compliance with the Project Approval noise criteria.

Heron Resources propose to undertake the attended monitoring initially on a monthly basis as required by the project approval with the result of monitoring to be reviewed on a quarterly basis. Where ongoing noise monitoring results do not indicate noise non-compliance Heron Resources would seek to negotiate a reduction in monitoring frequency. Additional short-term attended monitoring may also be undertaken within 14 days of receiving a noise complaint(s), should it occur and if required.

During the attended noise measurements, the operator will record any significant Project related noise sources as well as other extraneous noise sources such as other industrial operations and/or local traffic. In addition, the operator will obtain copies of the relevant fixed plant and mobile equipment operating shift logs that could be included in the noise monitoring report.

In circumstances where the attended monitoring was affected by adverse weather conditions (i.e. wind speed and/or inversions outside the valid range of values (Refer Notes **Table 2.2**), an additional set of monitoring will be conducted at the earliest opportunity that will cover the relevant site activities.

All attended noise monitoring will be conducted by an acoustics specialist using a Type 1 sound level meter as defined in AS IES 61672.1:2004 – Sound Level Meters and in accordance with the NSW INP guidelines and AS 1055:1997 – Acoustics, Description and Measurement of Environmental Noise with consideration to annoying noise characteristics as defined in the NSW INP.

Table 5.1: Noise Monitoring locations

Location	Approximate distance from Project Site (m)
Woodlawn Farm	1400
Cowley Hills	700
Pylara	3200
Willeroo	6000
Torokina	4400

5.2 Meteorological Monitoring

Schedule 4, Condition 18 of the Approval requires that;

"For the life of the project, the Proponent shall ensure that there is a suitable meteorological station operating in the vicinity of the site that complies with the requirements in the *Approved Methods for Sampling of Air Pollutants in New South Wales* guideline."

Heron Resources has an agreement to use the existing on site weather station owned by Veolia which meets Australian Standard (AS) 2923 – 1987: "*Ambient Air Guide for the measurement of horizontal wind for air quality applications*".

The parameters to be measured are summarised in **Table 5.2**.

Table 5.2: Weather Station Parameters

Parameter	Units	Frequency	Averaging Period	Sampling Method
Rainfall	mm	Continuous	1-hour	AM-4
Temperature @ 2 m	°C		15 minute	AM-4
Temperature @ 10 m	°C			AM-2 and AM-4
Wind Speed @10 m	m/s			AM-2 and AM-4
Wind Direction @ 10 m	Degrees			AM-2 and AM-4
Sigma Theta	Degrees			AM-2 and AM-4
Solar Radiation	W/m^2			AM-4

6 NOISE MANAGEMENT SYSTEM

The Noise Management System will be implemented by the Environmental Manager (or delegate), using monitoring data obtained as described in **Section 5**.

6.1 Protocol for Compliance Evaluation

The site noise level contribution ($L_{Aeq\ (15\ min)}$, and $L_{AMax\ (15\ min)}$) for the Project site will be estimated in the absence of any influential, extraneous or erroneous sound that is audibly distinguishable to that of the Project site, and compared to the operational noise assessment criteria to determine compliance. Monitoring results above the Project Approval criteria will not be considered as exceedances until the data has been assessed. The $L_{Aeq\ (15minute)}$ period noise level contributions from the operations as well as the overall ambient noise levels together with the weather and Project site operating conditions will also be compiled on a quarterly basis and provided to NSW Planning and Environment.

It should be noted that in instances where monitoring may not be conducted at residential receivers due to access limitations, noise levels may be measured at the nearest accessible point and extrapolated via calculation to the nearest residential receiver location for comparison to noise assessment criteria.

Where monitoring indicates a potential 'non-compliance' (see below for clarification provided within the NSW INP) against Project Approval Criteria, the following factors will be reviewed to examine the potential influence of those factors on the noise monitoring:

- Wind speeds above 3m/s at 10metres above ground level.
- Temperature inversion condition of more than 3deg/100m and down wind speeds more than 2m/s at 10metres above ground level.
- Irregular site activities such as adjacent non-mining related activities, agricultural activities, residential activities, other industrial activities and accuracy of data and equipment calibration.

Additional noise measurement or monitoring methods such as near field monitoring or unattended directional noise monitoring may be utilised to investigate noise emissions in relation to noise complaints, or to determine compliance with the Project Approval conditions where exceedances have been measured or are difficult to quantify from operator-attended or unattended noise measurements. Compliance may be determined by:

- Operator estimated noise contribution.
- Calculation from near field measurements.
- From post analysis of audio recordings.
- Measurement at an alternative representative location.
- Predictions from a noise model of the current operating scenario; or
- A combination of any or all the above methods.

The NSW INP will be used when determining mitigation measures required as a result of any potential non-compliance with the Project Approval noise criteria. The NSW INP takes into account both the level of exceedance and prevailing conditions or non-standard weather effects when assessing compliance with licence/consent conditions.

The following is stated in the NSW INP:

> "A development will be deemed to be in non-compliance with noise consent or licence condition if the monitored noise level is more than 2 dB above the statutory noise limit specified in the consent or licence condition. This may occur for two reasons:

The noise from the development is excessive, in which case the development is truly not complying with its consent or licence condition; and/or

The noise was increased by extreme, non-standard weather effects—in which case the development is not considered to be in non-compliance with its consent or licence condition. Non-standard weather effects can be considered to be present during monitoring if the cloud cover is less than 40 per cent and the wind speed (at 10 m height) is less than 1.0 m/s (represents an extremely adverse weather condition for noise)—during the period from 6 pm to 7 am in non-arid areas.

In this latter case, further monitoring at a later date is required to determine compliance under the meteorological conditions specified in the consent/licence condition."

Should the investigation show that the contributed noise level exceeds the noise impact assessment criteria, the non-compliance will be reported to DPE and affected landowners.

6.1.1 Non-Compliance and Corrective Action

Where the compliance evaluation indicates non-compliance with the Noise Criteria, the following actions will be undertaken:

- Determine the activities that were most likely contributing to the non-compliance.
- Review the operations and current controls in place for these activities.
- Identify feasible and reasonable noise mitigation options.

Corrective action may be required and involve modification of activities or program to avoid any recurrence or minimise its adverse effects.

6.1.2 Implementation of Noise Mitigation and Management Measures

This stage of the protocol involves the implementation of the noise mitigation and management measures (**Section 4**). The operations manager will be responsible for the timely implementation of the selected measures.

6.1.3 Review of Noise Mitigation and Management Measures Employed

The effectiveness of the adopted measures will be assessed against the relevant criteria identified in **Section 2.1**. The management strategy phase of the protocol will be revisited as required.

In addition, the Environmental Manager (or delegate) will note any trends in the monitoring data that may emerge in regards to particular operating scenarios or meteorological conditions.

The outcomes of the Noise Management System will be reported in the Annual Review.

7 COMPLAINTS RESPONSE PROTOCOL

7.1 Introduction

In accordance with Schedule 6, Consent Condition 3 (e), the NMS will detail the procedures for managing and reporting complaints in relation to noise.

The objective of the Complaint Response Protocol is to facilitate prompt and comprehensive responses to community concerns that relate to noise. The Protocol will be the responsibility of the Environmental and Community Manager (or delegate).

7.2 Assessment

Preliminary investigations will commence as soon as practical of the complaint receipt to determine likely causes of the complaint using information regarding prevailing meteorological conditions, the nature of activities taking place and recent noise monitoring results. Noise monitoring could also be undertaken if required to assist in investigating the complaint.

This preliminary investigation will be used to develop specific mitigation measures which will be presented to the landowner.

7.3 Implementation of Mitigation Measures

Those mitigation measures developed as a result of the complaint investigation will be implemented by the operations manager. Following implementation, monitoring will further assess the effectiveness of the additional noise control measures.

7.4 Management of Complaints Where Criteria are Exceeded

Complaints will be managed as detailed in the overall Environmental Management Strategy for the site. Any complaints will be logged in the complaints register, which will document the following information:

- Date and time the complaint was logged,
- Personal details, if provided by the complainant,
- Nature of the complaint,
- Actions taken or if no action taken then the reason why, and
- Follow up with the complainant.

In the event of a complaint, where noise levels are demonstrated to be below the relevant criteria (see **Section 2**) the resolution process will be one of informed discussion involving the complainant and the Environmental Manager (or delegate). The complainant will be made fully aware of the monitoring and reporting procedures used at the site. Every effort will be made to ensure that concerns are addressed in a manner that results in a mutually acceptable outcome.

8 REPORTING AND REVIEW

8.1 Annual Review

In accordance with Schedule 6, Condition 4 of the Project will, by the end of December each year, or timing as may be agreed by the Director-General, review the environmental performance of the project to the satisfaction of the Director-General. This review will:

- describe the development (including any rehabilitation) that was carried out in the past calendar year, and the development that is proposed to be carried out over the next calendar year;
- include a comprehensive review of the monitoring results and complaints records of the project over the past calendar year, which includes a comparison of these records against:
  - relevant statutory requirements, limits of performance measures/criteria;
  - requirements of any plan or program required under this approval;
  - the monitoring results of previous years; and
  - the relevant predictions in the EA/NVA
- identify any non-compliance over the past calendar year, and describe what actions were (or are being) taken to ensure compliance;
- identify any trends in the monitoring data over the life of the project;
- identify any discrepancies between the predicted and actual impacts of the project, and analyse the potential cause of any significant discrepancies; and
- describe what measures will be implemented over the next calendar year to improve the environmental performance of the project.

8.2 Community Consultative Committee

In accordance with Schedule 6, Condition 6, a Community Consultative Committee (CCC) will be established and operated in general accordance with the *Guidelines for Establishing and Operating Community Consultative Committees for Mining Projects* and to the satisfaction of the Director-General. The CCC will be established and operating before construction of the Project commences.

8.3 Noise Exceedance Reporting

A noise exceedance is defined here as an exceedance of the noise criteria at a privately owned residence. In accordance with Schedule 5, Condition 1, the Mine Operators will notify the landowners and/or tenants in writing of the exceedance within two weeks of obtaining the monitoring results.

8.4 General Reporting

In accordance with Schedule 6, Condition 8, Woodlawn Mine Project will provide regular reporting on the environmental performance of the development on its website, in accordance with the reporting arrangements in any plans of the conditions of this approval.

8.5 Independent Environmental Audit

An Independent Environmental Audit will be undertaken within one year of commencing construction, and every three years thereafter (unless directed otherwise by the Director-General). In accordance with Schedule 6, Condition 9 of the approval, the audit will:

- be conducted by a suitable qualified, experienced and independent team of experts whose appointment has been endorsed by the Director-General;
- include consultation with the relevant agencies;

- assess the environmental performance of the project and assess whether it is complying with the requirements in the approval and any relevant EPL (including any assessment, plan or program required under these approvals);
- review the adequacy of any adopted strategies, plans or programs required under the abovementioned approvals; and
- recommend appropriate measures or actions to improve the environmental performance of the project, and/or any assessment, strategy, plan or program required under these approvals.

In accordance with Schedule 6, Condition 10, within six weeks of completion this audit, or as otherwise agreed by the Director-General, Woodlawn Mine Project will submit a copy of the audit report to the Director-General, together with its response to any recommendations contained in the audit report.

8.6 Access to Information

Prior to the commencement of construction on the site, in accordance with Schedule 6, Condition 11, Woodlawn Mine Project will make copies of the following publically available on its website:

- the EA
- the conditions of the Project Approval
- all relevant statutory approvals for the project in relation to noise
- approved noise management strategies, plans or programs required under the Project Approval
- a comprehensive summary of the noise monitoring results of the project, reported in accordance with the specifications of the approval, or approved plans or programs
- a complaints register, updated monthly
- minutes of the CCC meetings
- the annual reviews of the project
- the independent environmental audit, and Woodlawn Mine Project's response to the recommendations in the audit
- any other matter required by the Director-General.

The above information must be kept up-to-date.

8.7 Review

In accordance with Schedule 6, Condition 5 of the approval, within 3 months of the submission of:

- an annual review (Section 8.1)
- an exceedance report (Section 8.3)
- an audit report (Section 8.5), or
- any modification to the conditions of the approval, (unless the conditions require otherwise),

Woodlawn Mine Project will review these strategies, plans and programs, and revise if necessary, to the satisfaction of the Director-General.

9 ROLES AND RESPONSIBILITIES

In addition to the specific responsibilities for noise management which are outlined in **Section 4**, general roles and responsibilities for the implementation of the NMP are presented in **Table 9.1**.

Table 9.1: Roles and Responsibilities

Task	Responsibility	Timing
Monitoring of noise in accordance with **Section 5**.	Environment Manager	Ongoing
Assessment of noise monitoring data against relevant criteria outlined in **Section 2**.	Environment Manager	Ongoing
Exceedances of noise criteria to be managed in accordance with the Noise Management System described in **Section 8**.	Environment Manager	As required
Noise complaints to be responded to and recorded in accordance with the Complaints Response Protocol in **Section 7**.	Environment Manager	As required
Annual Review to include noise monitoring results, complaints, mitigation measures undertaken and a review of the performance of monitoring and measures undertaken in accordance with **Section 8**.	Environment Manager	Annually
Regular review of the NMP to be completed in accordance with **Section 8**.	Environment Manager	As required

10 REFERENCES

Australian Standard (2004) "AS IEC 61672.1:2004 – Sound Level Meters

Australian Standard (1997), "AS 1055.1,2,3:1997 Acoustics – Description and measurement of environmental noise"

DECCW (2009) "Interim Construction Noise Guideline"

DEC (2006), "Assessing Vibration: A Technical Guideline"

DECCW (2011) "NSW Road Noise Policy"

DEFRA, UK (2008) "Construction Noise Database (Phase 3), Database of noise emissions from equipment used on construction and open sites"

EPA (2000) "NSW Industrial Noise Policy"

PAEHolmes (2012), "Noise and Vibration Assessment – TriAusMin Woodlawn Project", prepared for Parsons Brinckerhoff on behalf of TriAusMin Limited, February 2012. Job number 5665B

Parsons Brinckerhoff (2011) "Woodlawn Mine Expansion EA"

RTA (2001) "Environmental Noise Management Manual"

Wilkinson Murray (July 2008), "Woodlawn Mine Noise and Vibration Assessment – Report No. 07076-EA

11 GLOSSARY

Term	Definition
ABL	The Assessment Background Level is the single figure background level representing each assessment period (daytime, evening and night-time) for each day. It is determined by calculating the 10th percentile (lowest 10 percent) background level (LA90) for each period.
Adverse meteorological conditions	Meteorological conditions under which noise propagation is enhanced. This typically includes the presence of wind and temperature inversions.
Ambient Noise	The all-encompassing noise associated within a given environment. It is the composite of sounds from many sources, both near and far.
A-weighting	Refers to an adjustment made to noise levels to take into account the frequency composition of an acoustic signal relative to the ear's response to the various frequencies that make up the noise. A-weighting is applied to approximate the perception of noise by an "average" human ear response.
Background Noise	The underlying level of noise present in the ambient noise, excluding the noise source under investigation, when extraneous noise is removed. This is described using the L_{A90} descriptor.
C-weighting	Refers to an adjustment made to noise levels to take into account the frequency composition of an acoustic signal relative to the ear's response to various frequencies with added sensitivity in the low frequencies compared with the A-weighting.
dB(A)	Decibel level with an applied A-weighting.
dB(C)	Decibel level with an applied C-weighting
dB(Lin)	Decibel level with a Linear weighting i.e. no frequency weighting applied.
Decibel, dB	Decibel is a logarithmic unit used to describe the ratio of a signal level relative to a reference level and is used to describe sound pressure and sound power magnitudes.
L_1	The L_1 level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the L_1 level for 99% of the time.
L_{10}	The L_{10} level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the L_{10} level for 90% of the time. The L_{10} is a common noise descriptor for environmental noise and road traffic noise.
L_{50}	The L_{50} level is the noise level which is exceeded for 50% of the sample period. During the sample period, the noise level is below the L_{50} level for 50% of the time.
L_{90}	The L_{90} 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_{90} level for 10% of the time. This measure is commonly referred to as the background noise level.
L_{eq}	The equivalent continuous sound level (L_{eq}) 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_{max}	The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.
L_n	The level exceeded for N% of the monitoring time.
Neutral meteorological conditions	Meteorological conditions under which no enhancements to noise propagation are present, i.e. temperature inversions and light wind conditions.
RBL	The Rating Background Level for each period is the median value of the ABL values for the period overall of the days measured. There is therefore an RBL value for each period – daytime, evening and night-time.
Sound Power Level (SWL)	A logarithmic measure of source acoustic power expressed in dB. The sound power level is fixed and inherent to the source similar to how electric power is inherent to an electrical device. The resulting sound pressure level due to a given sound power level is dependent on various environmental factors such as distance, acoustic shielding, meteorological factors etc.
Stability Class	The system of classifying atmospheric stability using considerations of solar radiation, surface wind speed, cloud cover and temperature lapse rate. The scale ranges from A (strongly unstable) to F (moderately stable). Typically Stability Class D is considered to represent neutral atmospheric conditions and the conventional temperature gradient, typical of daytime conditions. Stability Class F is considered to represent stable atmospheric conditions when a moderate temperature inversion is present.

Term	Definition
Temperature Inversion	An atmospheric condition when the temperature gradient in the air is inverted so that sound waves are refracted in the air back towards the ground, enhancing the distance over which noise propagates.

Appendix C – Blast Management Plan

Woodlawn Project

Heron Resources Limited

Blast Management Plan

Revision 1

April 2017

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1. Plan Objective

This document has been prepared to satisfy Condition 12 of Schedule 4 of the Modified Project Approval 07_0143 and describes the following:

- The legal and other requirements associated with management of blasting operations within the Project Site.
- Blast management measures that would be implemented during all blasting operations.
- Evaluation of compliance of blasting operations.
- Incident reporting.
- Publication of monitoring information.
- Roles and responsibility.
- Competence training and awareness.
- Document review.

Table 1.1 presents the objectives and key performance outcomes for this Blasting Management Plan and the Project.

Table 1.1 - Objectives and Key Performance Outcomes

OBJECTIVES	KEY PERFORMANCE OUTCOMES
To ensure compliance with all relevant Project Approval and Environmental Protection Licence criteria and reasonable community expectations.	Compliance with all relevant criteria and reasonable community expectations.
To implement appropriate blast management and mitigation measures during all stages of the Project.	All identified blast and noise management and mitigation measures implemented.
To implement an appropriate blast monitoring program to establish compliance or otherwise with relevant criteria during all stages of the Project.	All identified monitoring undertaken in accordance with the relevant procedures and at the relevant intervals
To implement an appropriate complaint handling and response protocol.	Complaints (if any) handled and responded to in an appropriate manner.
To implement appropriate corrective and preventative actions, if required.	Corrective and preventative actions implemented, if required.
To implement an appropriate incident reporting program, if required.	Incidents (if any) reported in an appropriate manner.

2. Background

2.1 Woodlawn Mine

The Woodlawn Mine is operated by Tarago Operations Pty Ltd (TOP), a 100% owned subsidiary of Heron Resources Limited (Heron).

Woodlawn is a high-grade, volcanogenic massive-sulphide (VMS) deposit containing lead, zinc, copper, silver and gold mineralisation in economic concentration. It is located approximately 50km northeast of Canberra, on the Southern Tablelands of New South Wales, Australia.

The Woodlawn site is subject to Special (Crown and Private Land) Lease No. 20 (SML 20). The Project consists of an underground mine, a run-of-mine (ROM) stockpile, temporary waste rock emplacement, tails mining facilities, processing plant for the reprocessing of tailing and underground mine ore, tailings storage facility and associated infrastructure and ancillary activities.

2.2 Project Documentation

This Blasting Management Plan (BMP) is one of several documents that define the project and describe how the project will be delivered. In addition, these defining documents are supported by specific management plans, company policies and procedures.

Reference documentation for the development of the Woodlawn Project includes:

- Environmental Assessment dated April 2012 and associated documentation prepared to support the application for Project approval.
- Project Approval 07_0143 (granted under Section 75J Environmental Planning & Assessment Act 1979, 4 July 2013);
- Modification to Project Approval (07_0143MOD1, 22 April 2016);
- Mining Operations Plan (August 2015);
- Veolia Cooperation Agreement (29 March 2017);
- EPL 20821 (29 March 2017);
- Feasibility Study (Technical Report (NI43-101) Feasibility Study for the Woodlawn Project, New South Wales, Australia. SRK Consulting (Australasia) Pty Ltd, 19 July 2016);
- Heron's Safety Management Plan (SMP)

2.3 Statutory Licenses and Consents

Table 2.1 summarises the statutory licences and consents relating to Heron (in its subsidiary Tarago Operations) at Woodlawn.

Table 2.1 - Heron Licences and Consents

Authority	Title	Critical date:
NSW Department of Trade and Investment - Div Resources & Energy	Special (Crown and Private Lands) Lease 20 (known as SML20)	November 2029
NSW Trade and Investment - Div. Resources & Energy	Mining Operations Plan	30 November 2021
NSW Dams Safety Authority	Surveillance Reports for Five Prescribed Dams	June 2015 (annual intermediate and five yearly major surveillance)
Planning and Environment	Heron Resources proposed Woodlawn Mine Project (MP 07_0143MOD1)	4 July 2013 for a period of 21 years
NSW EPA	Environment Protection Licences 20821	Approved 29 March 2017. Reviewed every 3 years

2.4 Cooperation Deed with Veolia

The site is shared with Veolia Environmental Services (Australia) (Veolia) who operate a landfill, gas powered generator and mechanical biological treatment plant. Veolia and Heron have a Cooperation Deed that was renewed in March 2017 replacing a previous deed.

The Cooperation Deed is a result of the parties acknowledging that there are opportunities for mutual benefit, including but not limited to:

- joint use of facilities, including power supply and connections, water and water infrastructure, weighbridges, offices, and loading and rail facilities;
- Heron taking over rehabilitation obligations in relation to the mining operations on SML20;
- use by Heron of Compost Material from Veolia in rehabilitation; and
- Heron using energy derived from Veolia's operations.

Veolia also has several approvals, consents and licences that are listed in Table 2.2.

Table 2.2 - Veolia Licences and Consents

Authority	Title	Critical date
NSW Planning and Environment	Veolia Development Consent DA31-02-99 for Bioreactor	6 September 2025
NSW EPA	Veolia Environment Protection Licences 11436 and 20476	Reviewed every 3 years
NSW Primary Industry - Water	Bore Licence 40BL106422 Bore Licence 40BL106423 Bore Licence 40BL106424 Bore Licence 40BL106425	Ongoing subject to renewals
NSW Primary Industry - Water	3A Permit (Rivers and Foreshores Act) A 350/2/2001-0) for Crisps Creek	July 2005 (renewed annually)
WorkCover NSW	Licence for the keeping of dangerous goods: 35/021066	August 2005 (renewed annually)
Goulburn Mulwaree Shire Council	Licence to Operate an Onsite Sewerage Treatment Plant	July 2013
NSW Planning and Environment	Bioreactor Expansion (MP10-0012)	16 March 2012

3. Specific Requirements Relating to Blasting

The Project received project approval on 4 July 2013 pursuant to the Environmental Planning and Assessment Act 1979 (EP&A Act). The Project Approval was modified to include specific water management performance measure and approved by the Director-General of the Department of Planning and Infrastructure on 29 April 2016.

The Project Approval stipulates the required criteria that the construction and operational activities of the Project must comply with and sets out the core requirements of the Blasting Management Plan. Relevant conditions associated with this approval are reproduced in Sections 3.1 to 3.5.

3.1 Blasting Criteria

Blasting Criteria for private residences

TOP shall ensure that blasting on the site does not cause exceedances of the criteria in Table 3.1.

Table 3.1 - Blasting Criteria relating to private residences

Location	Time of Blasting	Airblast overpressure ($dB_{(Lin\ Peak)}$)	Ground vibration (mm/s)	Allowable exceedance
Residence on privately-owned land	Any time	120	10	0%
	Day	115	5	5% of the total number of blasts over a period of 12 months
	Evening	-	2	
	Night, and all day on Sundays and public holidays	-	1	0%

Note: All blasts are to be designed by a suitably qualified and experienced blasting engineer.

Vibration Limits for Veolia Facilities

Additionally, and as agreed with Veolia in Clause 11.6 of the Cooperation Deed:

"To reduce the likelihood of blasting-induced pit slope failure, a maximum PPV limit of 25mm/sec must be initially adopted measured at the surface slopes within the open pit, the MBT Facility and all other Veolia operations. Single hole trial blasts must be carried out at the commencement of Box Cut construction operations to confirm impacts on Veolia's operations. The initial PPV limit may require ongoing adjustment and the Parties agree that the PPV limit may be adjusted from time to time by Veolia, acting reasonably, depending on monitored performance."

3.2 Blasting Hours

TOP shall comply with the blasting hours in Table 3.2.

Table 3.2 – Blasting Hours

Activity	Blasting Hours
Surface blasting	9am – 5pm Monday to Friday, excluding public holidays
Underground blasting	Anytime

3.3 Blasting Frequency

In relation to above ground blasting, TOP may carry out a maximum of 1 blast per day, unless an additional blast is required following a blast misfire.

This condition does not apply to blasts required to ensure the safety of the site or its workers, and to minor additional blasts required during the construction of the box cut to access the underground workings.

Note: For this condition, a blast refers to a single blast event, which may involve a number of individual blasts fired in quick succession in a discrete area of the site.

3.4 Operating Conditions

During operation of the project, TOP shall implement best management practice to:

(a) protect the safety of people and livestock in the surrounding area;

(b) protect public or private infrastructure/property in the surrounding area from any damage; and

(c) minimise the dust and fume emissions from any blasting; and to the satisfaction of the Director-General.

3.5 Blast Management Plan

TOP shall prepare and implement a Blast Management Plan for the project to the satisfaction of the Director-General. This plan must:

(a) be prepared in consultation with the Veolia and Infigen Energy, and submitted to the Director- General for approval prior to commencing blasting on the site;
(b) describe the process for incrementally developing and monitoring blasting design (Section 4 and Figure 4.1);
(c) describe the blast mitigation measures that would be implemented to ensure compliance with the blasting criteria (Section 4, 0 and 6); and
(d) include a blast monitoring program to evaluate the performance of the project (Section 6).

3.6 Special Permission required from Veolia

Section 10.2 of the Cooperation Deed with Veolia refers to and defines an "Exclusion Area" around the open pit. No blasting can be undertaken within the Exclusion Area without the express prior written approval of Veolia. The exclusion area does not include the box cut.

4. Blasting Design and Management

Blasting for the Woodlawn Mine can be divided into three broad types:

1. Blasting for the excavation of the boxcut portal;
2. Blasting for underground mine development; and
3. Underground production blasting (stoping).

While the management measures for underground development and production blasting have similar objectives, the excavation of the boxcut requires additional management measures.

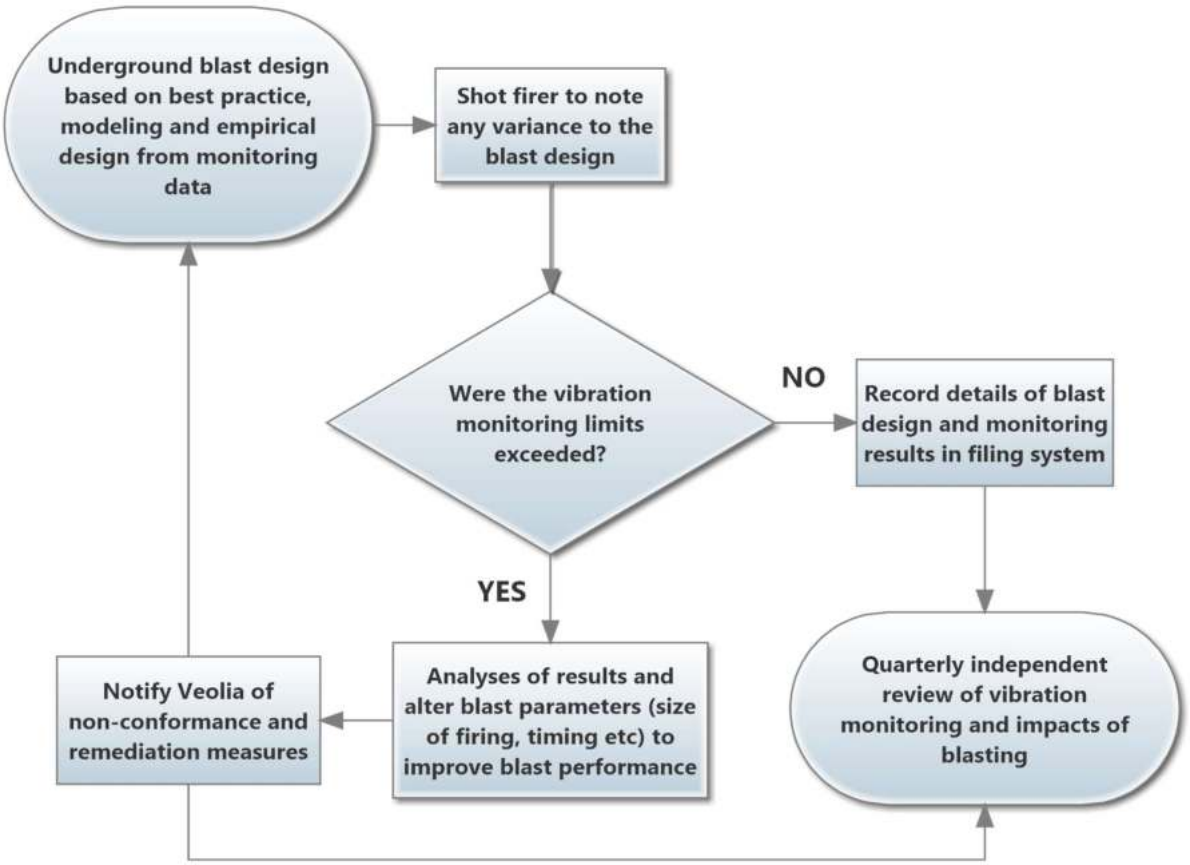
Best practice blast management procedures will be implemented at the Woodlawn Mine to minimise air blast overpressure, ground vibration levels, fly rock, fume, dust and odour from blasting activities.

All blasts will be designed by a suitably qualified and experienced blasting engineer. Each blast will be designed in a manner that ensures compliance with blast criteria identified in Table 3.1 and the peak particle velocity (PPV) stipulated in the Cooperation Deed, or as subsequently amended or altered.

Once sufficient blast monitoring data has been collected, standard procedures and blast design criteria will be developed in accordance with industry practice to comply

with the key site blasting parameters. Figure 4.1 illustrates the broad process for managing changes in blast designs based on vibration monitoring.

Figure 4.1 – Blast design and monitoring



Once a sufficient body of data has been collected and blast performance can be accurately predicted, blasts may be designed based on the specific knowledge gained, without the need for systematic blast vibration monitoring.

4.1 Excavation of the boxcut

The boxcut provides access to the new underground mine, and allows underground development to commence below the base of oxidation, in more competent and less weathered rocks. Table 4.1 details the estimated material quantities to be removed during the excavation of the boxcut, with a total excavation of 184,000 bank cubic metres (BCM). It is anticipated that 96% of the excavation will be free digging or require the use of a large dozer to loosen the rock mass by ripping. It is anticipated that only 4% of the total excavation will require drill and blast techniques to be employed.

Table 4.1 – Estimated Material Quantities

Type	Unit	Free dig	Dozer Rip	Drill & Blast	Total
Dump	BCM	108,891	-	-	108,891
Oxide	BCM	44,673	21,022	-	65,695
Transition	BCM	-	1,802	7,206	9,008
Total	BCM	153,564	22,824	7,206	183,594
Total	**%**	**84%**	**12%**	**4%**	**100%**

Indicative Boxcut Blast Design

Blast designs will be tailored to suit the conditions encountered as the free digging materials are removed from the excavation. It is important to note that as much of the boxcut as is practical will be excavated without the use of explosives.

As detailed in Table 4.1, it is anticipated that only around 4% of the material excavated will require blasting. It is anticipated that blast design will comprise:

- Blast hole diameter = 89mm;
- Blast hole length = 5.5m (including 0.5m sub drill);
- Burden = between 3 and 3.5m;
- Spacing = between 3 and 3.5m;
- Stemming length = 1.6m;
- Explosive type = ANFO; and
- Initiation = Nonel detonators and G Boosters or similar.

Based on a transition rock density of 2.1 t/m^3, the charge density is anticipated to be between 0.15 and 0.2 kg per tonne. Heron expects that approximately five (5) separate firings will be required to finish the excavation, with the change mass of explosive (ANFO) of less than 500kg for each firing. These specifications a subject to change based on blast monitoring data, and Heron will communicate any significant change in blast planning with Veolia.

Boxcut Blasting Control Measures

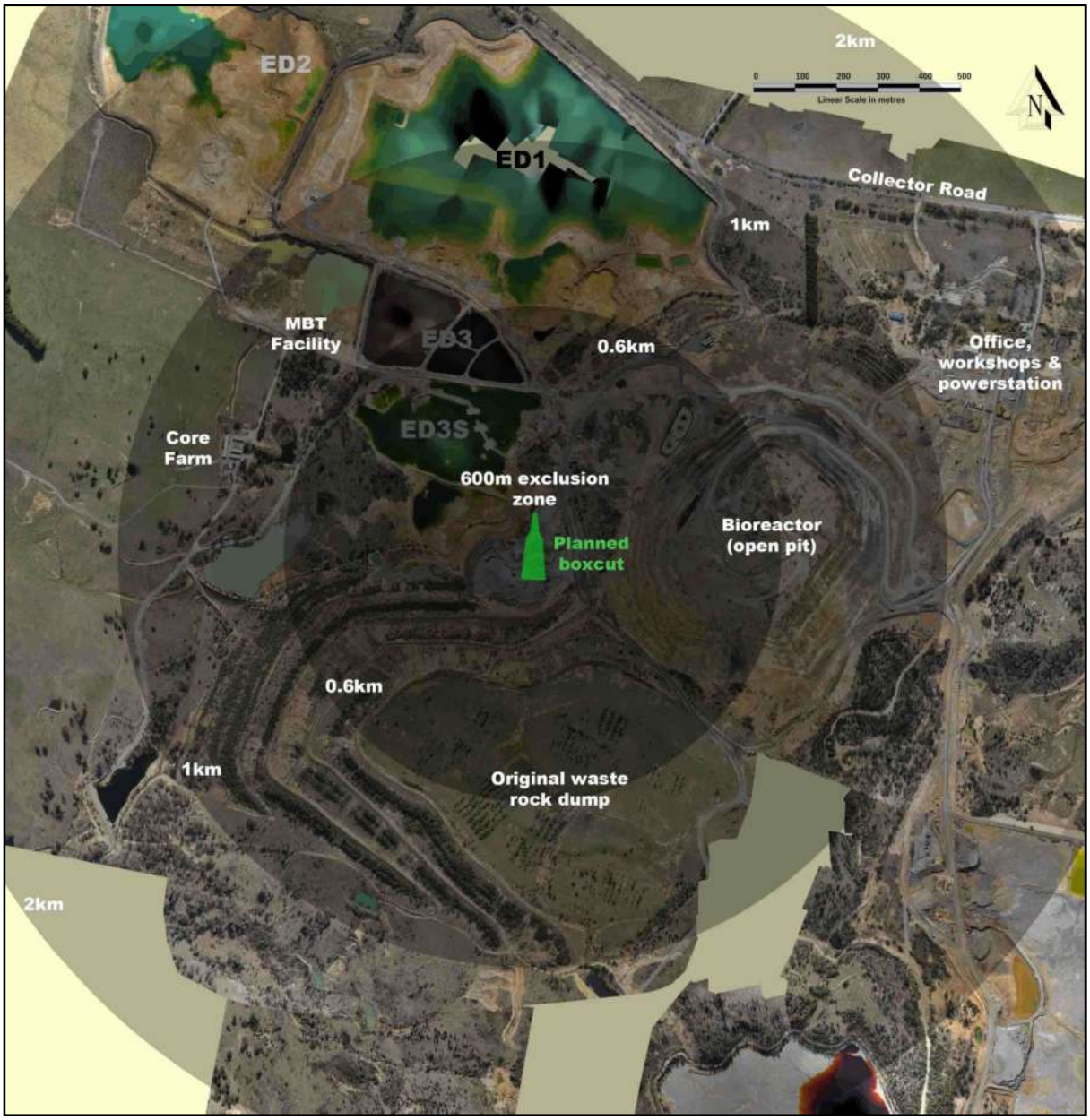
Best practice control of ground vibration, overpressure and fly rock impacts will be achieved by developing shot firing Safe Work Procedures which will include:

- Conducting a pre-blast environmental assessment with consideration given to wind speed and direction prior to each blast before an approval to blast is issued. Blasts will be fired in suitable weather conditions that minimise the potential for blast generated dust and/or blast fume to be blown towards Veolia facilities.
- Use of initiation systems that minimise vibration. Due to the small amount of blasting anticipated, each blast pattern will be bespoke designed dependent

on conditions encountered. Initiation system will be selected to ensure compliance with vibration criteria and may include the use of electronic detonators to ensure an adequate spread of in-hole delays;

- Use of adequate stemming lengths to ensure maximum confinement of explosive charges minimizing fly rock and overpressure;
- Use of suitable quality stemming material consisting of angular crushed dolerite or similar;
- Ensuring adequate burden is present on all faces. Face surveying techniques may be employed to measure overburden between the blast face and blast holes to ensure sufficient burden is present to prevent blowouts and blast anomalies;
- Adherence to blast loading and initiation designs unless risks are determined by the shotfirer at the time of loading that may be mitigated through changes to design;
- Possible use of blast mats to contain and minimise fly rock;
- Use of monitoring data to establish and refine predictive tools to estimate likely overpressure and vibration levels during the design process of subsequent blasts; and
- Posting blast guards to enforce a 600 metre radius blast exclusion zone during firing times. A specific blast clearance safe work procedure will be developed in coordination with Veolia. Blasting of the boxcut will require the clearance of the bioreactor and areas shown in Figure 4.2.**Error! Not a valid bookmark self-reference.**Firing times will only be undertaken between 16:30 and 17:00 hours weekdays. Heron will liaise with Veolia to minimise any disruption to Veolia's activities. Given the limited scope of drill and blast activities required for the excavation of the box cut, Heron will aim at minimising the number of individual blasts.

Figure 4.2 – Site layout and blast exclusion zone



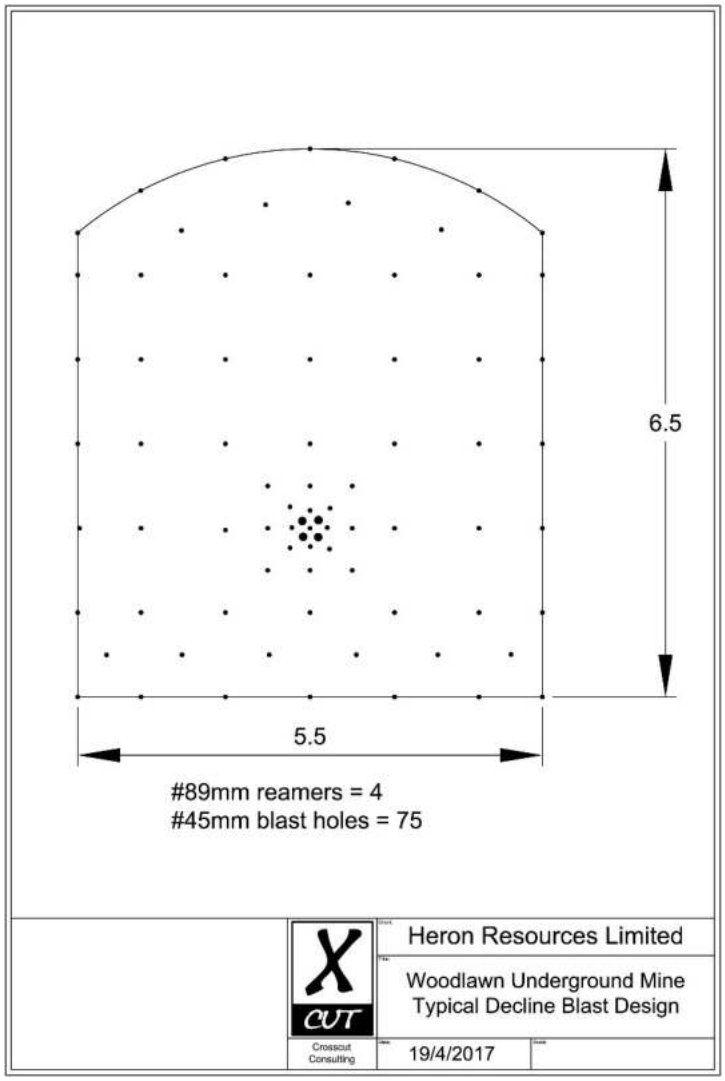
4.2 Underground Development Blast Design

All underground development requires drill and blast excavation techniques. Figure 4.3 illustrates a conceptual blast hole design for a decline heading (6.5mH x 5.5mW). The key design parameters (preliminary) are as follows:

- Number of 89mm Ø holes = 4;
- Number of 45mm Ø holes = 68 to 75
- Hole (cut) length = 4.5m;
- Explosive = ANFO (approx. 430kg per cut);
- Initiation = Nonel LP dets with powergel booster;

- Powder Factor = 1.0 kg/tonne (approx.)

Figure 4.3 – Underground Development Blast Design

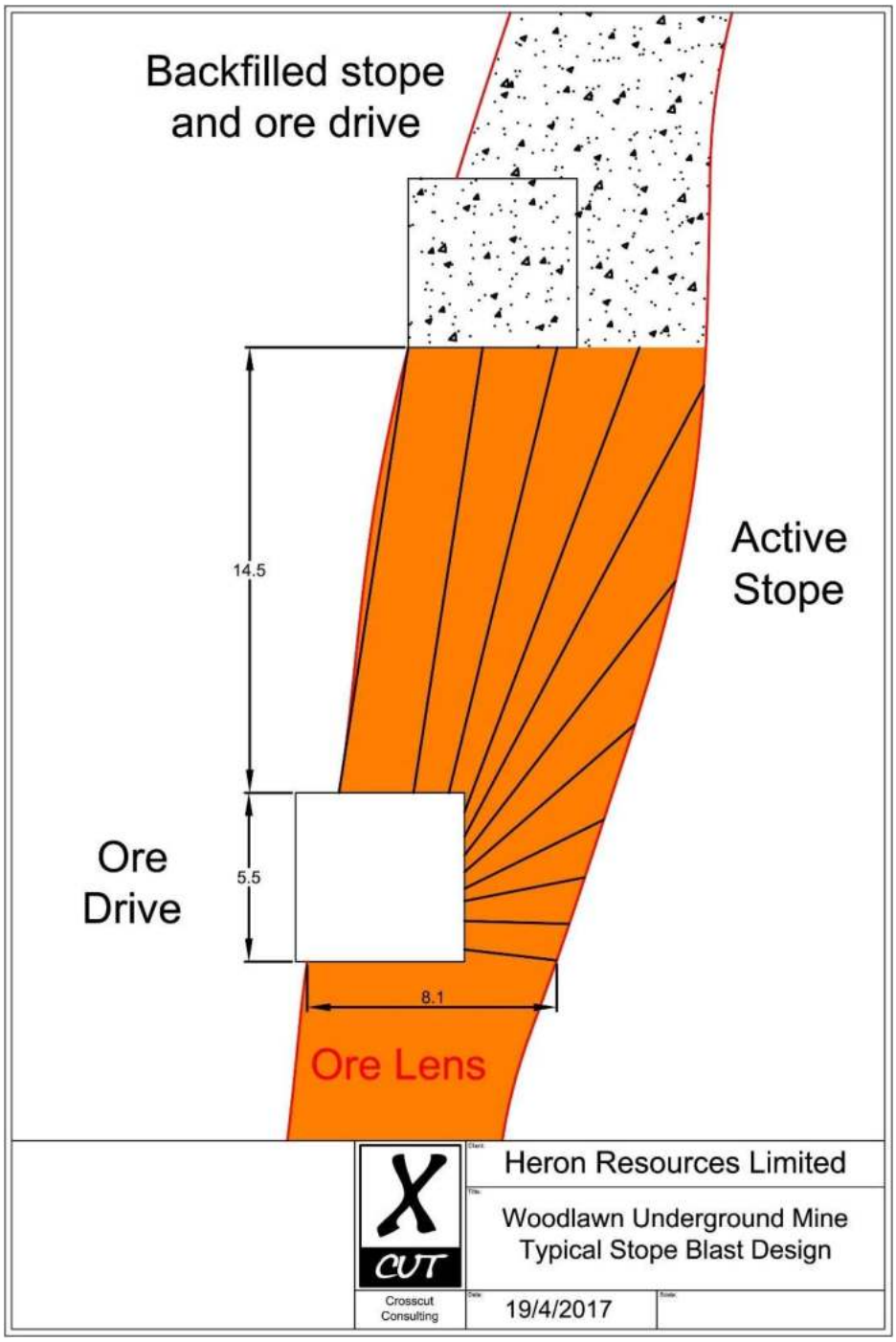


4.3 Underground Stope Blast Design

All underground stoping requires drill and blast excavation techniques. Figure 4.4 illustrates a conceptual stope drill pattern. The key design parameters (preliminary) are as follows:

- Number of 89mm Ø blast holes = 11;
- Total drill metres = 111m;
- Total charge length = 79m
- Explosive = ANFO (approx. 492kg per ring);
- Initiation = Nonel millisecond or electronic detonators with G Booster or similar;
- Total ring tonnage = 1,200 tonnes (approx.);
- Powder Factor = 0.4 kg/tonne (approx.)

Figure 4.4 – Stope drill pattern



The size of individual firings will be dependent on operation requirements and empirical design based on data collected from vibration monitoring. Typical stope firings may consist of two to ten blast rings.

Similarly, initiation may consist of millisecond Nonel detonators or electronic detonators depending on operational requirements and individual stope design considerations.

4.4 Blasting Times

Underground blasting may be undertaken at any time. It is noted that particularly during early stage development that restricting underground blasting operations to certain times of day will not be practicable. However, once steady state operations are implemented and where practicable, the Company will ensure that underground blasts are undertaken at the change of the underground shift.

4.5 Blast Notification

One or more blast notice boards will be installed at the entrance to the Project Site and in a prominent location in Veolia's office to advise Project personnel and visitors of the blasting schedule.

4.6 Underground Blasting Control Measures

Best practice control of ground vibration and other blast related hazards will be achieved by developing shot firing Safe Work Procedures which will include:

- Adherence to blast designs unless risks are determined by the shotfirer at the time of loading that may be mitigated through changes to design;
- Use of initiation systems that minimise vibration. The initiation system will be selected to ensure compliance with vibration criteria and may include the use of electronic detonators to ensure an adequate spread of in-hole delays;
- Surveying of underground voids to measure over-break resulting from excessive blasting. This will help optimise blast patterns and reduce explosive consumption and vibration generation;
- Use of monitoring data to establish and refine predictive tools to estimate likely vibration levels during the design process of subsequent blasts; and
- Blast designs will identify any drive, raise or drill hole that may connect the blast site with the surface;
- Access to underground workings, declines and raises will be guarded during firing times. In addition, any area where a connection between the blast site and surface is possible (i.e. surface drill holes) will either be sealed or guarded;
- Stope firing will only be undertaken at the end of shift. While shift times remain to be finalised, stope firing times are likely to be 06:00 and 18:00 hours, 7 days a week. Heron will aim to ensure that these are kept outside the Bioreactor's hours of operations.

5. Monitoring

5.1 Vibration Monitoring

Routine monitoring and analysis of blast vibration data will be undertaken at the following times:

- During the excavation of the boxcut;
- During the initial phases of the underground mine development;
- During the initial phases of stope blasting;
- Periodically during routine operations; and
- At any time when significant changes to blasting practice and procedures is made.

The aim of vibration monitoring is to determine the impact of blasting on Veolia's operations and private residences to develop blast design and operational procedures and guidelines to mitigate the issues related to blasting.

5.2 Pit Surveys

As stipulated in Section 11.5 of the Veolia Cooperation Deed, routine and adequate surveying of the pit slopes will be undertaken. A series of monitoring prisms around the pit are currently in place and are regularly monitored. These data form a baseline for future activities.

6. Mitigation of Blast Effects

If blast monitoring identifies an exceedance of the criteria identified in any of the conditions, the exceedance will be investigated to determine the probable cause. The investigation will seek to determine:

- whether the exceedance of the criteria was directly related to a source associated with the Project or if environmental factors contributed to the exceedance;
- the primary cause of the exceedance;
- any contributing factors which led to the exceedance;
- whether appropriate controls were implemented to prevent the exceedance; and
- corrective and preventative measures that may be implemented to prevent a recurrence of the exceedance.

Corrective and/or preventative actions will be assigned to relevant Company personnel. In addition, the blast parameters and blast criteria will be reviewed considering the monitoring results and adjusted as required to ensure no further exceedance of the criteria. Actions will be communicated internally through planning meetings and toolbox talks and outstanding actions will be monitored for their effectiveness upon completion.

A copy of the investigation report and regular updates on the status of the identified corrective and/or preventative actions will be provided to Veolia and if required, the relevant government agencies and/or any other complainant, in accordance with the procedures detailed in Section 7.

6.1 Specific Mitigation Priorities

Pertaining to underground blasting and the mitigation of the effects of blasting, particularly vibration, the following areas will be considered in the blast design process:

- Timing of initiation. The aim will be to limit the number of holes firing on a single delay time. In development blasts this may mean the use of alternative detonators such as "develdets" over traditional LP detonators. In stope blasting this may include the use of "connector dets" or electronic detonators over the traditional millisecond in-hole delays.
- Optimisation of explosive quantity required to break the rock. This may reduce the overall powder factor required, but specifically the amount of explosive in each hole being fired, thereby reducing the vibration.
- Utilising raise bored slots for the generation of the initial free face for stope firings.
- Optimising the ring burden and spacing and examining the impact on blast vibration generation.
- Developing a detailed knowledge of vibration propagation and attenuation characteristics of different rock types and the impact of geological structure.
- Appointment of a professional engineer as the blasting engineer. Role responsibilities include design and implementation of all drill and blast operations and communication with production drillers and charge up crews.
- Regular review of blasting practices and clear communication of monitoring and the results of blasting with drillers and charge up crews.

7. Incident Reporting

7.1 Reporting of Statutory Conditions

If blast monitoring records an exceedance of the criteria identified in any statutory condition, the event will be reported to NSW Department of Planning and Infrastructure, EPA and other relevant agencies within 24 hours of detecting the exceedance.

Within 7 days the exceedance, the Company will submit a written report that:

- describes the date, time, and nature of the exceedance;
- identifies the cause (or probable cause) of the exceedance;
- describes what action has been taken to date; and

- describes the proposed measures to address the exceedance.

Incident reporting is a requirement of Condition 7 of Schedule 6 in the Project Approval.

7.2 Reporting of Site Specific Conditions

If blast monitoring records an exceedance of the criteria identified in any site-specific condition detailed in Veolia Cooperation Deed, the event will be reported within 24 hours.

If the monitoring has any safety implication on Veolia's Operations, the incident will be reported as soon as practicable and mining operations suspended.

8. Roles and Responsibilities

ROLES	RESPONSIBILITY
General Manager	Must ensure adequate resources are available to enable implementation of the Plan.
Mining Manager	Accountable for the overall environmental performance of the Project, including the outcomes of this Plan.
Blasting Engineer	Design all blasts to ensure compliance with statutory and site specific conditions and conduct and review monitoring data following each blast to ensure compliance. Where non- compliance recorded, advise Environmental Supervisor and Mining Manager.
Shot Firer	Conduct all blasts in accordance with statutory and site safety work procedures.
Environmental Supervisor	Ensure the implementation of this Plan, including reporting of non-compliances with the criteria identified in statutory and/or site specific conditions. Ensure employees are competent through training and awareness programs.

9. Competence Training and Awareness

All personnel shall undergo blast management awareness training. Blast Management shall be a component of the competency based site induction program.

The Environmental Supervisor shall be responsible for ensuring the appropriate Blast Management training is included in the induction.

10. Blast Management Plan Review

10.1 Annual Review

In accordance with Condition 4 of Schedule 6 in the Approval, at the end of December each year, TOP will review the environmental performance of the project, including the BMP, to the satisfaction of the Director- General.

TOP shall review, and if necessary revise, the strategies, plans, and programs required under the Approval, within 3 months of the following:

- the submission of an annual review;
- the submission of an incident report (described in Section 7);
- the submission of an audit under Condition 9 of Schedule 6 of the Project Approval; and
- any modification to the conditions of the Project Approval (unless the conditions require otherwise).

10.2 Independent Review – Provision in the Approval

Additionally, Condition 2 of Schedule 5 in the Approval allows provision for independent review of this Plan.

If an owner of privately-owned land considers the project to be exceeding the relevant criteria as described in Schedule 4 of the Project Approval (including the criteria described in the Plan), then owner may ask the Director-General in writing for an independent review of the impacts of the project on the owner's land.

If the Director-General is satisfied that an independent review is warranted, then within two months of the Director-General's decision TOP shall:

- commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Director-General, to:
    - consult with the landowner to determine his/ her concerns;
    - conduct monitoring to determine whether the project is complying with the relevant criteria; and
    - if the project is not complying with these criteria then identify measures that could be implemented to ensure compliance with the relevant criteria.
- give the Director-General and landowner a copy of the independent review.

If the independent review determines that the project is not complying with the relevant criteria then TOP shall:

- implement all reasonable and feasible mitigation measures, in consultation with the landowner and appointed independent person, and conduct further monitoring until the project complies with the relevant criteria; or

- secure a written agreement with the landowner to allow exceedances of the relevant criteria.

10.3 Independent Review – Provision in the Veolia Cooperation Deed

As stipulated in Section 11.7 of the Veolia Cooperation Deed, an independent review of compliance with all aspects of Section 11 of the Veolia Cooperation Deed, which relates to mining and blasting, will be conducted quarterly.

11. Definitions

Annual Review	The review required by Condition 4 of Schedule 6 of MP 07_0143
Approval	The Project Approval for the Woodlawn Mine Project, MP 07_0143.
BMP	Blast Management Plan
Director-General	The Director General of the Department of Planning and Environment
DPE	Department of Planning and Environment
DRE	Division of Resources and Energy within the Department of Trade and Investment, Regional Infrastructure and Services
DSC	Dam Safety Committee
EA	Environmental Assessment titled '*Environmental Assessment: TriAusMin Woodlawn Project*' dated April 2012 and associated response to submissions titled '*Submissions Report: TriAusMin Woodlawn Project*', dated September 2012 Environmental Assessment titled 'Woodlawn Mine *Environmental Assessment: Proposed Modification to Project Approval 07 0143 For the Relocation of the Underground Mine Entry*' dated January 2016 and associated response to submissions titled 'Woodlawn Mine Project Application 07_0143 MOD1 Response to *Submissions*', dated March 2016.
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000*
EPA	Environment Protection Authority
EPL	Environment Protection Licence issued under the POEO Act
Mining operations	Includes the removal of waste rock and the extraction, processing, handling storage and transportation of ore material from the WRP and WUP
Minister	Minister for Planning, or delegate
MP 07_0143	The Project Approval for the Woodlawn Mine Project.
NOW	NSW Office of Water, within the DPI
OEH	Office of Environment and Heritage
POEO Act	*Protection of the Environment Operations Act 1997*
Privately-owned land	Land that is not owned by a public agency or a mining company (or its subsidiary).
Project	The project described in the EA
Project Approval	The Project Approval for the Woodlawn Mine Project, MP 07_0143.

Proponent	Tarago Operations Pty Ltd, or any other person or persons who rely on this approval to carry out the development that is subject to this approval
TOP	Tarago Operations Pty Ltd, a 100% owned subsidiary of Heron Resources Limited.

12. References

(a) Special (Crown and Private Lands) Lease 20 (known as SML20).

(b) Project Approval, Woodlawn Mine Project MP 07_0143MOD1, Department of Planning and Infrastructure, April 2016.

(c) Mining Operations Plan, Heron Resources Limited, August 2015.

(d) Environment Protection Licences 20821, NSW EPA, Approved 29 March 2017.

(e) Veolia Cooperation Agreement, Allion Partners, 29 March 2017.

(f) Feasibility Study for the Woodlawn Project (Technical Report (NI43-101), New South Wales, Australia, SRK Consulting (Australasia) Pty Ltd, 19 July 2016.

Appendix D - Project Approval

Appendix E – Environment Protection Licence

Environment Protection Licence

Licence - 20821

Licence Details	
Number:	20821
Anniversary Date:	29-March

Licensee
TARAGO OPERATIONS PTY LTD
LEVEL 7, SUITE 702, 191 CLARENCE STREET
SYDNEY NSW 2000

Premises
WOODLAWN MINE PROJECT
507 COLLECTOR ROAD
TARAGO NSW 2580

Scheduled Activity
Concrete works
Contaminated groundwater treatment
Crushing, grinding or separating
Mineral processing
Mining for minerals

Fee Based Activity	Scale
Concrete works	> 50000 m3 annual production capacity
Contaminated groundwater treatment	Any annual handling capacity
Crushing, grinding or separating	> 500000-2000000 T annual processing capacity
Mineral processing	> 500000-2000000 T annual processing capacity
Mineral waste generation	> 100 T annual volume of waste generated or stored
Mining for minerals	> 100000-500000 T annual production capacity

Environment Protection Licence

Licence - 20821

Region
South East - Queanbeyan 11 Farrer Place QUEANBEYAN NSW 2620
Phone: (02) 6229 7002
Fax: (02) 6229 7006
PO Box 622 QUEANBEYAN NSW 2620

Environment Protection Licence

Licence - 20821

Environment Protection Licence

Licence - 20821

Environment Protection Licence

Licence - 20821

Information about this licence

Dictionary

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

Responsibilities of licensee

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

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

Variation of licence conditions

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

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

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

Duration of licence

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

Licence review

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

Fees and annual return to be sent to the EPA

For each licence fee period you must pay:

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

Environment Protection Licence

Licence - 20821

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

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

Transfer of licence

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

Public register and access to monitoring data

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

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

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

This licence is issued to:

TARAGO OPERATIONS PTY LTD
LEVEL 7, SUITE 702, 191 CLARENCE STREET
SYDNEY NSW 2000

subject to the conditions which follow.

Environment Protection Licence

Licence - 20821

1 Administrative Conditions

A1 What the licence authorises and regulates

A1.1 This licence authorises the carrying out of the scheduled development work listed below at the premises listed in A2:
Infrastructure and facilities in support of mining. Construction activities including a new ore processing plant, buildings and ancillary equipment, new tailings storage facility, box cut and overland haul road..

Note: Until such time as the scheduled development works are completed, Condition A1.1 supersedes Condition A1.2.

A1.2 This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee-based activity classification and the scale of the operation.

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

Scheduled Activity	Fee Based Activity	Scale
Concrete works	Concrete works	> 50000 m3 annual production capacity
Contaminated groundwater treatment	Contaminated groundwater treatment	Any annual handling capacity
Crushing, grinding or separating	Crushing, grinding or separating	> 500000 - 2000000 T annual processing capacity
Mineral processing	Mineral processing	> 500000 - 2000000 T annual processing capacity
Mineral processing	Mineral waste generation	> 100 T annual volume of waste generated or stored
Mining for minerals	Mining for minerals	> 100000 - 500000 T annual production capacity

A2 Premises or plant to which this licence applies

A2.1 The licence applies to the following premises:

Premises Details
WOODLAWN MINE PROJECT
507 COLLECTOR ROAD
TARAGO
NSW 2580

Environment Protection Licence

Licence - 20821

THE PREMISES IS DEFINED IN THE MAP "ATTACHMENT 1 WOODLAWN SITE EPL - MONITORING SITES" SUBMITTED BY THE LICENSEE TO THE EPA ON 17 MARCH 2017. DRAWN BY DEAN OLIVER 17-03-2017, DRAWING NO. TOP - G - 001.

A3 Information supplied to the EPA

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

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

2 Discharges to Air and Water and Applications to Land

P1 Location of monitoring/discharge points and areas

P1.1 The following points referred to in the table below are identified in this licence for the purposes of monitoring and/or the setting of limits for the emission of pollutants to the air from the point.

Air

EPA identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description
1	Dust monitoring		Dust Monitoring DG28 - located at Pylara farm
2	Dust monitoring		Dust Monitoring DG22 - eastern side of the EPL 11436 Bioreactor void
3	Dust monitoring		Dust Monitoring DG24 - western side of the EPL 11436 Bioreactor void
4	Dust monitoring		Dust Monitoring DG33 - (EPL 20476 dust deposition monitoring point 7)
5	Meteorological		Meteorological station located at the EPL 11436 premises.

P1.2 The following utilisation areas referred to in the table below are identified in this licence for the purposes of the monitoring and/or the setting of limits for any application of solids or liquids to the utilisation area.

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

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Water and land

EPA Identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description
6	Surface Water Monitoring		Site 115 - Allianoyonyiga Creek
7	Surface Water Monitoring		Site 105 - Crisps Creek
8	Surface Water Monitoring		Site 100 - Woodlawn/Willeroo Boundary South, below Waste Rock Dam.
9	Surface Water Monitoring		Site 109 - Pylara Boundary below South Tailings Dam.
10	Surface Water Monitoring		Site 300 - Processing Plant Pollution Control Dam. Final dam below the new processing facility.
11	Ground Water Monitoring		MB4
12	Ground Water Monitoring		MB5 - southern face of the rehabilitated waste rock dump
13	Ground Water Monitoring		MB6 - adjacent to mine entry
14	Ground Water Monitoring		MB8 - adjacent to Collector Road and downstream of proposed processing plant site
15	Ground Water Monitoring		MB12 - below ED2 dam wall
16	Ground Water Monitoring		MB13 - western premises boundary
17	Ground Water Monitoring		MB14 - background ground water quality site
18	Ground Water Monitoring		MB15 - measures seepage from Rehabilitated Waste Rock Dump
19	Surface Water Monitoring		Evaporation Dam 2 (ED2)
20	Surface Water Monitoring		Tailings Storage Facility 4 (TSF4)
21	Ground Water monitoring		MB11 - below ED2 dam wall
22	Ground Water Monitoring		MB16 - measures seepage from Rehabilitated Waste Rock Dump
23	Ground Water Monitoring		MB17 - measures seepage from Rehabilitated Waste Rock Dump

3 Limit Conditions

L1 Pollution of waters

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

L2 Noise limits

L2.1 Noise from the premises must not exceed an $L_{Aeq,15\ minute}$ noise level of 35 dB(A) at any sensitive receivers.

L2.2 For the purpose of Condition L2.1:

'Day' is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sunday and Public Holidays;

'Evening' is defined as the period from 6pm to 10pm on any day; and

'Night' is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sunday and Public Holidays.

L2.3 The noise emission limits identified in Condition L2.1 apply under meteorological conditions of:

a) Wind speeds up to 3 m/s at 10m above ground level; or
b) temperature inversion conditions of up to 3 °C/100m and wind speeds up to 2 m/s at 10m above ground level

L2.4 **Determining Compliance**

To determine compliance:
a) with the Leq(15 minute) noise limits in Condition L2.1, the noise measurement equipment must be located:
i) approximately on the property boundary, where any dwelling is situated 30 metres or less from the property boundary closest to the premises; or
ii) within 30 metres of a dwelling façade, but not closer than 3m, where any dwelling on the property is situated more than 30 metres from the property boundary closest to the premises; or, where applicable

L3 Blasting

L3.1 The licensee must ensure that the airblast overpressure level from blasting at the project does not exceed the criteria in the below table at any residence on privately owned land:

Location	Time of Blasting	Airblast overpressure (dB(Lin Peak))	Ground vibration (mm/s)	Allowable exceedence
Residence on any privately-owned land	Any time	120	10	0%
	Day	115	5	5% of the total number of blasts over a period of 12 months
	Evening	-	2	5% of the total number of blasts over a period of 12 months
	Night, and all day on Sundays and public holidays	-	1	0%

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L4 Hours of operation

L4.1 Construction activities at the premises must only be conducted between the times specified in the table below:

Activity	Operating Hours
Construction	7am to 7pm, 7 days per week.
Blasting (surface)	9am to 5pm Monday to Friday, excluding public holidays
Blasting (underground)	Any time

L5 Potentially offensive odour

L5.1 No condition of this licence identifies a potentially offensive odour for the purposes of section 129 of the Protection of the Environment Operations Act 1997.

Note: Section 129 of the Protection of the Environment Operations Act 1997, provides that the licensee must not cause or permit the emission of any offensive odour from the premises but provides a defence if the emission is identified in the relevant environment protection licence as a potentially offensive odour and the odour was emitted in accordance with the conditions of a licence directed at minimising odour.

L6 Other limit conditions

Use and transfer of waters

L6.1 Only treated leachate, treated and untreated mine water, stormwater runoff, raw water from the Woodlawn Dam and water from the Waste Rock Dam may be utilised on-site or discharged to the premises defined in EPL 11436. The discharges and transfers permitted are those shown in Attachment 2 Woodlawn Site EPL Water Transfers, held by the EPA as DOC17/172868.

4 Operating Conditions

O1 Activities must be carried out in a competent manner

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

O2 Maintenance of plant and equipment

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

O3 Dust

O3.1 All operations and activities occurring at the premises must be carried out in a manner that will minimise the emission of dust from the premises.

O4 Waste management

O4.1 The liner for Tailings Storage Facility 4 must achieve a permeability of no less than $1x10^{-9}$metres per second to a depth of at least 900mm of clay (or equivalent) in accordance with the EPA's Environmental Guidelines - Solid Waste Landfills (2016).

5 Monitoring and Recording Conditions

M1 Monitoring records

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

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

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

M2 Requirement to monitor concentration of pollutants discharged

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

M2.2 Water and/ or Land Monitoring Requirements

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POINT 6,7,8,9,10,19,20

Pollutant	Units of measure	Frequency	Sampling Method
BOD	milligrams per litre	Quarterly	Grab sample
Conductivity	microsiemens per centimetre	Quarterly	Grab sample
Dissolved Oxygen	milligrams per litre	Quarterly	Probe
Nitrogen (ammonia)	milligrams per litre	Quarterly	Grab sample
pH	pH	Quarterly	Grab sample
Potassium	milligrams per litre	Quarterly	Grab sample
Redox potential	millivolts	Quarterly	Grab sample
Total dissolved solids	milligrams per litre	Quarterly	Grab sample
Total organic carbon	milligrams per litre	Quarterly	Grab sample

POINT 11,12,13,14,15,16,17,18

Pollutant	Units of measure	Frequency	Sampling Method
Alkalinity (as calcium carbonate)	milligrams per litre	Quarterly	Grab sample
Aluminium	milligrams per litre	Quarterly	Grab sample
Arsenic	milligrams per litre	Quarterly	Grab sample
Barium	milligrams per litre	Quarterly	Grab sample
Benzene	milligrams per litre	Quarterly	Grab sample
Cadmium	milligrams per litre	Quarterly	Grab sample
Calcium	milligrams per litre	Quarterly	Grab sample
Chloride	milligrams per litre	Quarterly	Grab sample
Chromium (hexavalent)	milligrams per litre	Quarterly	Grab sample
Chromium (total)	milligrams per litre	Quarterly	Grab sample
Cobalt	milligrams per litre	Quarterly	Grab sample
Copper	milligrams per litre	Quarterly	Grab sample
Ethyl benzene	milligrams per litre	Quarterly	Grab sample
Fluoride	milligrams per litre	Quarterly	Grab sample
Lead	milligrams per litre	Quarterly	Grab sample
Magnesium	milligrams per litre	Quarterly	Grab sample
Manganese	milligrams per litre	Quarterly	Grab sample
Mercury	milligrams per litre	Quarterly	Grab sample
Nitrate	milligrams per litre	Quarterly	Grab sample
Nitrite	milligrams per litre	Quarterly	Grab sample
Nitrogen (ammonia)	milligrams per litre	Quarterly	Grab sample
Organochlorine pesticides	milligrams per litre	Quarterly	Grab sample
Organophosphate pesticides	milligrams per litre	Quarterly	Grab sample

pH	pH	Quarterly	Grab sample
Polycyclic aromatic hydrocarbons	milligrams per litre	Quarterly	Grab sample
Potassium	milligrams per litre	Quarterly	Grab sample
Sodium	milligrams per litre	Quarterly	Grab sample
Standing Water Level	metres	Quarterly	In situ
Sulfate	milligrams per litre	Quarterly	Grab sample
Toluene	milligrams per litre	Quarterly	Grab sample
Total dissolved solids	milligrams per litre	Quarterly	Grab sample
Total organic carbon	milligrams per litre	Quarterly	Grab sample
Total petroleum hydrocarbons	milligrams per litre	Quarterly	Grab sample
Total Phenolics	milligrams per litre	Quarterly	Grab sample
Xylene	milligrams per litre	Quarterly	Grab sample
Zinc	milligrams per litre	Quarterly	Grab sample

M3 Testing methods - concentration limits

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

M4 Recording of pollution complaints

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

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

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

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

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M5 Telephone complaints line

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

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

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

6 Reporting Conditions

R1 Annual return documents

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

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

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

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

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

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

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

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

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

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

R2 Notification of environmental harm

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

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

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

R3 Written report

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

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

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

f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and
g) any other relevant matters.

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

7 General Conditions

G1 Copy of licence kept at the premises or plant

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

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

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

8 Special Conditions

E1 Mine dewatering

E1.1 The licensee submitted a methodology for the removal, treatment and storage of underground mine water to the EPA on 10 April 2017. The EPA provided written approval of the methodology in writing on the 9th of May 2017.

E1.2 The licensee may carry out dewatering of the underground mine workings in accordance with the proposal contained in the document “Application Under Condition 8 E1.1 of EPL 20821 - Mine Dewatering”, submitted to the EPA on 10 April 2017 (DOC17/221071).

E1.3 Stage 1 “Pump Set Up, Commissioning and Pumping” may proceed at the licensee’s convenience. The licensee must provide a report to the EPA following the completion of Stage 1 documenting the methodology, results and lessons learnt from Stage 1.

E1.4 Stage 2 “Pumping” must not proceed without written approval from the EPA. The licensee must provide a report to the EPA following the completion of Stage 2 documenting the methodology, results and lessons learnt from Stage 2.

E1.5 Stage 3 “Ongoing Mine Dewatering” must not proceed without written approval from the EPA. If, following the successful completion of Stages 1 and 2, the dewatering strategy has proven to have no environmental impacts with regard to odour and water quality, the licensee may proceed with mine dewatering as part of normal operations at the premises following written approval from the EPA.

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Dictionary

General Dictionary

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

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

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

Mr Julian Thompson

Environment Protection Authority

(By Delegation)

Date of this edition: 29-March-2017

End Notes

2 Licence varied by notice 1551976 issued on 12-May-2017

Appendix F - Consultation Log

Consultation Log - Noise and Blasting and Dust Management Plans

Date	Form/Agency	Comments and Outcomes	Response/how addressed
3/7/2014	Initial consultation letter to: NSW Trade and Investment Environment Protection Authority NSW Office of Water Sydney Catchment Authority Office of Environment and Heritage Department of Planning and Environment	These letters were the initial consultation and sought specific advice from each agency according to the respective relevant management plan.	Noted
11/9/14	Letter to DPE	Seeking approval of Experts engaged in relevant management Plan	Approval provided
10/10/14	Email to Julian Thompson and Michael Heinz EPA	Confirmation of meeting details	Noted
13/10/14	Meeting with EPA and OEH Queanbeyan Office	General project briefing, need for EPL separation with Veolia EPL, monitoring conditions, lack of archaeology sites and impact, need to define vegetation offset area and outcomes	Ongoing negotiation with EPA in relation to licensing requirements
9/3/16	Meeting with Community Consultation Committee	Presentation to Woodlawn Community Consultation Committee which included overview of project, monitoring program, construction program, workforce numbers, exploration and environmental management plan preparation and content.	Draft EMPs provided on web page for download by committee members
27/05/16	email to Julian Thompson EPA	Copy of Noise and Blast Management Plan provided to EPA for comment	Noted
27/05/16	Email to Julian Thompson EPA	Copy of Air Quality Management Plan provided to EPA for comment	Noted
10/8/16	EPL Application to EPA	Application for new EPL covering Woodlawn Mine construction and operation	Noted
12/10/16	Letter to DPE re additional Experts	Letter from Heron Resources requesting approval of additional experts engaged in management plan preparation	Noted and approved by DPE
12/10/16	Email from EPA re licence application	First draft EPL provided for comment with request for additional plans	6 emails to and from EPA and various phone calls in relation to comments on draft EPL
20/10/16	Letter from EPA re draft EPL	Provision of second draft EPL 20821 for the Heron operation	Noted
13/1/17	Meeting with EPA Queanbeyan	Meeting with EPA to discuss licence finalisation and amendments to allow	Additional consultants

Date	Form/Agency	Comments and Outcomes	Response/how addressed
		dewatering of the underground workings to commence. Advice received to seek an amendment to the existing Veolia EPL 114336 and to include details of staged dewatering and treatment	commissioned and dewatering strategy developed. No specific comments received in relation to noise, blasting or dust management. The inclusion of the 4 dust deposition gauge was added to the licence