

# SUBMISSIONS REPORT

## PROPOSED BIORESOURCES FACILITY UNIVERSITY DRIVE, CALLAGHAN

LOT 1 DP 1188100



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# 1. INTRODUCTION

## 1.1 Background

The proposal involves development of a Bioresources Facility at the University of Newcastle, Callaghan Campus. The proposed Bioresources Facility is development that requires consent pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The development is considered State Significant Development in accordance with Schedule 1 Clause 15(3) of State Environmental Planning Policy (State and Regional Development) 2011.

The development of a new Bioresources Facility has been identified as a key requirement to support current biomedical research activities at the University of Newcastle and to cater for future capability in response to emerging trends in biomedical research. An Environmental Impact Statement (EIS) (June 2018) was prepared by de Witt Consulting addressing the Department of Planning and Environment Secretary's Environmental Assessment Requirements (SEARs) issued 15 December 2017.

Detailed architectural plans are provided in this EIS to highlight proposed buildings and location of development.

## 1.2 Site Location and Context

The proposal is located within the University of Newcastle, Callaghan Campus. The proposed Bioresources Facility is located within Lot 1 DP1188100. The site is on University Drive, Callaghan and is accessed through the internal road network of the University.

The proposed facility will be a cross-faculty collaboration between Research & Innovation Division, Faculty of Science and Faculty of Health and Medicine (STEM+M) and be a foundational piece of research infrastructure for the University. As a foundational research facility supporting animal based research across all STEM+M fields, the facility will integrate within the new STEM+M Precinct in line with the NeW Futures Strategic Plan 2016-2025 (NeW Futures).

The Bioresources Facility will comprise of the following attributes:

- PC2 Standard Animal Holding and Procedure Spaces.
- Research & Breeding Animal Facilities to house approximately 4,400 rodent cages.
- Entry, Administration, Circulation and Office Spaces.
- Consumables and Waste Storage Areas and a Secure Loading Dock.
- Plant Room & Building Services Areas.
- Research Sample Freezer Farm.
- Fixed & Loose Laboratory, AV and Office Equipment.

## 1.3 Purpose of this Report

The Submissions Report has been prepared to address submissions received during exhibition of the EIS (21 June 2018 to 18 July 2018). The SEARs identified key issues to address including:

- Statutory and Strategic context
- Permissibility
- Development standards
- Policies
- Built form and urban design
- Environmental amenity
- Transport and accessibility

- Ecologically sustainable development
- Biodiversity
- Aboriginal heritage
- Noise and vibration
- Contamination
- Utilities
- Contributions
- Drainage
- Flooding
- Waste
- Bushfire.

The above issues were addressed in the EIS through desktop assessment and specialist investigations. A number of submissions were received in relation to the EIS. This report will:

- Consider submissions raised and provide a response to those issues
- Describe any changes to the proposal
- Provide revised environmental mitigation measures, if required.

## 2. Site Attributes and Location

### 2.1 Site Location

The site comprises of Lot 1 DP1188100 at 8 University Drive, Callaghan at the University of Newcastle. The site is approximately 140 hectares in size. Site area will not change as a result of the development.

The site is located within the Callaghan Campus of the University of Newcastle. To the north is the Medical Sciences buildings. To the east is the Biological Sciences building. To the south is the Science and Chemistry building. To the west is the Newcastle Inner City Bypass. The campus contains various buildings and areas utilised by current students and staff.



Photo 1 – Subject site with glasshouses

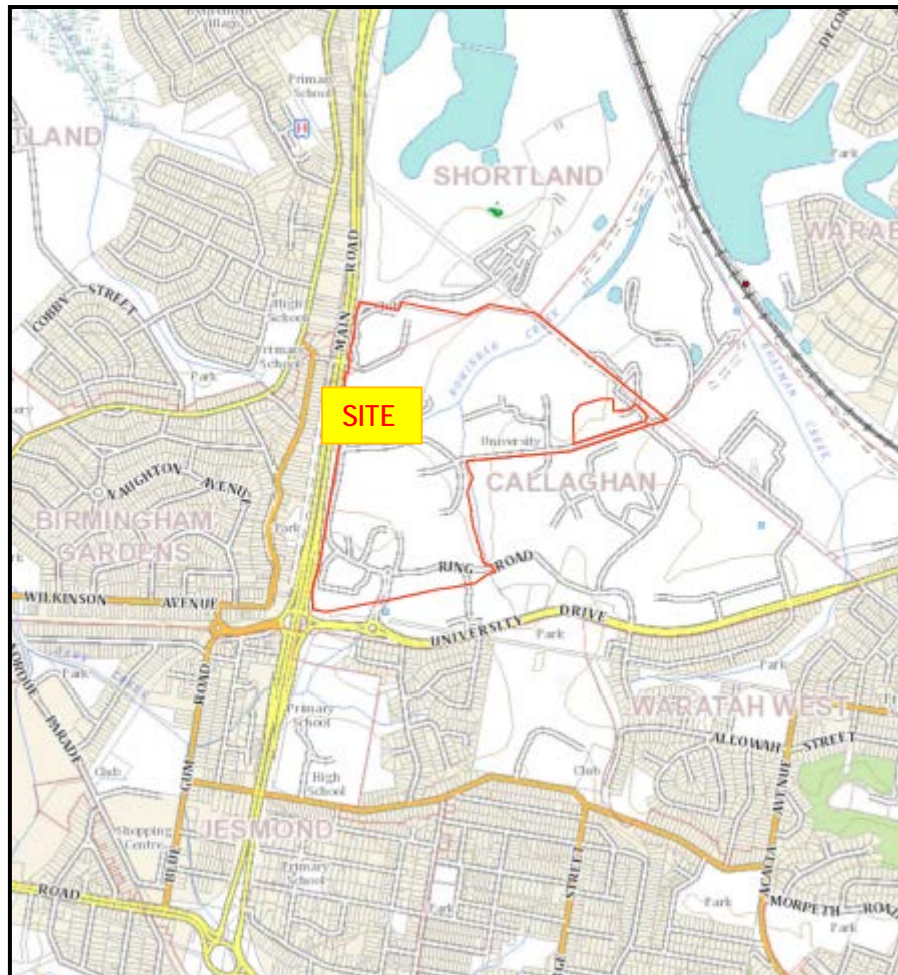


Figure 1 – Site Location

## 3. THE PROPOSAL

### 3.1 Proposed Development

The proposed development is construction and operation of a Bioresources Facility. The building will have a floor area of approximately 3,500m<sup>2</sup> and will be approximately 14 metres high. The building has been designed with consideration to site topography and the location within the University.

The proposed facility will be a cross-faculty collaboration between Research & Innovation Division, Faculty of Science and Faculty of Health and Medicine (STEM+M) and be a foundational piece of research infrastructure for the University. As a foundational research facility supporting animal based research across all STEM+M fields, the facility will integrate within the new STEM+M Precinct in line with the NeW Futures Strategic Plan 2016-2025 (NeW Futures).

NeW Futures highlights the institution's 2025 vision and future capital investment decisions need to reflect and support the University's strategy and deliver contemporary physical assets that allow The University of Newcastle to deliver outstanding education, research and innovation outcomes. The University's Environmental Sustainability Plan 2015-2017 and associated targets seek to deliver 20% reduction in CO<sub>2</sub>e/m<sup>2</sup> Gross Floor Area by 2020 and 40% reduction by 2030 on a 2007 baseline (University of Newcastle, 2015).

Underpinned by the University's STEM+M Strategy, NeW Futures outlines an ambitious path for The University of Newcastle's advancement into the top 200 of the world's universities and to help realise this, the Facility will provide:

- sufficient capacity for projected research involving animal based research well beyond 2025
- working conditions, personnel safety and animal welfare of the highest standard
- flexibility to support excellence within our existing research community
- sufficient capacity for projected research involving animal based research well beyond 2025
- facilitate collaboration and help launch The University of Newcastle into the forefront of competitiveness in new technologies
- advanced and emerging research technologies deemed critical to future research endeavour
- the consolidation of the animal research support and logistics infrastructure on the Callaghan campus.

The Bioresources Facility will comprise of the following attributes:

1. PC2 Standard Animal Holding and Procedure Spaces.
2. Research & Breeding Animal Facilities to house approximately 4,400 rodent cages.
3. Entry, Administration, Circulation and Office Spaces.
4. Consumables and Waste Storage Areas and a Secure Loading Dock.
5. Plant Room & Building Services Areas.
6. Research Sample Freezer Farm.
7. Fixed & Loose Laboratory, AV and Office Equipment.

The building has been designed to allow spaces within to be moved and modified to assist research and education goals.





## 3.2 Changes to Proposal

No changes are proposed to activities within the building. Detailed design and review of submissions has resulted in minor changes to landscaping, hours of construction, clarification of construction vehicle parking, additional Aboriginal heritage investigation and modifications to ventilation stacks (increase from 3 to 12 stacks and confirmation of stack heights). The proposed development is substantially the same as considered in the original EIS.

## 4. RESPONSE TO SUBMISSIONS

### 4.1 Exhibition and Location

The EIS was 21 June 2018 to 18 July 2018. Printed copies of the EIS were available at the following locations during exhibition:

- Newcastle City Council
- Department of Planning and Environment (Hunter and Sydney office).

Electronic copies of the EIS were available at:

- [http://majorprojects.planning.nsw.gov.au/index.pl?action=view\\_job&job\\_id=8937](http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=8937)

### 4.2 Responses Received

Department of Planning and Environment provided one submission and received a total of seven submissions from other agencies. No submissions were received from the public. Submissions were received from the following:

- Department of Planning and Environment
- Transport for NSW
- Newcastle City Council
- Government Architect NSW
- Office of Environment and Heritage
- Roads and Maritime Services
- NSW Rural Fire Service.

Each submission is summarised in Table 4.1 with a response provided. Where changes to the proposed development have occurred or new / amended environmental mitigation measures are proposed this has also been noted in the table.

**Table 4.1 – Response to Submissions**

Government Agency	Comments	Where addressed
Department of Planning and Environment	<b>Hazards (SEPP 33)</b> <input type="checkbox"/> Further details of nature and location of dangerous goods <input type="checkbox"/> Location of screening tests for dangerous goods	Section 4.3.
	<b>Aboriginal Heritage</b> <input type="checkbox"/> Cultural heritage assessment report is required	Section 4.4.
	<b>Construction traffic</b> <input type="checkbox"/> Location of construction workers vehicles on campus <input type="checkbox"/> Assessment of impact of construction vehicles at key intersections near campus, along proposed traffic route	Section 4.11.
	<b>Landscaping</b> <input type="checkbox"/> Detailed landscaped plans <input type="checkbox"/> Arborist report	Section 4.14.
	<b>Jobs</b> <input type="checkbox"/> Clarification of number of construction jobs	Section 4.9.
Newcastle City Council	<b>Acoustic report</b> <input type="checkbox"/> Further assessment for residential properties through off-site receivers <input type="checkbox"/> Further assessment for impacts of construction outside university hours in proposed construction periods	Section 4.5.
	<b>Sediment and Erosion Control</b> <input type="checkbox"/> More detailed plan given consideration of size of site, slope and proximity to local creeks	Section 4.6.
	<b>Odour assessment</b> <input type="checkbox"/> EIS did not include RCA recommendations <i>"an increase on stack heights be determined by further odour and plume dispersion investigations during the design process, as well as restrictions on autoclaving during early morning winter periods and implantation of waste practices and protocols"</i>	Section 4.12
	<b>Traffic &amp; Parking</b>	Section 4.11.

Government Agency	Comments	Where addressed
	<input type="checkbox"/> Identify onsite parking for construction vehicles.  <b>Stormwater</b> Provided plan is acceptable just need to include a new kerb inlet for the car park as in the sediment and erosion plan.  <b>Bushfire prone land mapping</b> <input type="checkbox"/> New version of Newcastle bushfire prone land; the campus site remains unchanged.  <b>Section 94A Development contributions plan 2009</b> <input type="checkbox"/> Council recommends full levy is applied for the cost of development	  Section 4.6.  Section 4.8.  Section 4.7.
Roads and Maritime Services	<input type="checkbox"/> RMS have the right to review the CTMP and can make changes in the interest of road safety and network efficiency <input type="checkbox"/> All works associated with the project shall be at the cost to the developer, with no cost to RMS.	Section 4.11.
Transport for NSW	<input type="checkbox"/> Bus services, pedestrian and bicycle rider movements be maintained at all times during the construction, particularly during university peak times <input type="checkbox"/> The applicant be conditioned to prepare a Construction and Pedestrian Traffic Management Plan (CPTMP) in consultation with Roads and Maritime Services and Newcastle City Council, prior to the commencement of works on site.	Section 4.11.
Government Architect NSW	<input type="checkbox"/> Provide an arborist report showing all existing trees and identifying trees to be removed (if any) as part of this application. <input type="checkbox"/> Appoint a landscape architect to prepare drawings in accordance with the SEARs requirement - showing existing trees, trees to be removed, site cross-sections and proposed details and finishes. <input type="checkbox"/> Adjustments to the architectural design to: <ul style="list-style-type: none"> <li>o rationalise circulation and lift location to better connect lifts with the main building entry and provide compliant access to the facility.</li> <li>o provide more information on the detail and finishes of the rooftop plant area, including accurate perspective views of the facility from elevated vantage points.</li> </ul>	Refer to Section 4.10 for arborist report. Refer to Section 4.13 for architectural response.

Government Agency	Comments	Where addressed
	<ul style="list-style-type: none"> <li>○ without compromising the architectural strategy or the functionality of the facility, reconsider the Level 01 perimeter wall design to provide greater transparency and natural light to corridors.</li> <li>○ on level 01, consider utilising the 'bulges' in the perimeter wall eg as a seating bay / breakout area.</li> <li>○ provide a Sample Board with proposed external finishes.</li> </ul>	
NSW Rural Fire Service	<p><b>Asset protection zone</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> 20 metres on the northern, western and southern elevations</li> <li><input type="checkbox"/> 25 metres on the eastern elevation</li> </ul>	Section 4.8.
	<p><b>Water and Utilities</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Water, electricity and gas are to comply with section 4.1.3 of planning for bushfire protection 2006</li> </ul>	Section 4.8.
	<p><b>Evacuation and emergency management</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> The existing evacuation and emergency plan for the university to be updated to into the bioresource facility and to consistent with development planning</li> </ul>	Section 5.33.
	<p><b>Landscaping</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Landscaping of the site shall comply with the appendix 5 principles of planning for bushfire protection 2006</li> </ul>	Section 4.14.
Office of Environment and Heritage	<p><b>Biodiversity</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> OEH granted a waiver from the requirement to submit a Biodiversity Development Assessment Report (BDAR) on 18 May 2018. No further biodiversity assessment is required and no biodiversity offsetting is required for this project.</li> </ul>	Noted.
	<p><b>Aboriginal Cultural Heritage</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> OEH recommends that the proponent prepare an Aboriginal Cultural Heritage Assessment Report (ACHAR) that documents the investigation of potential impacts to Aboriginal cultural heritage, as detailed in OEH SEARs for the project.</li> </ul>	Section 4.4.



Government Agency	Comments	Where addressed
	<b>Water, Flooding and Coastal</b> <input type="checkbox"/> OEH is satisfied with the flooding assessment provided and no further flooding assessment is required.	Noted.

### 4.3 Hazards

State Environmental Planning Policy No. 33 – Hazardous and Offensive Development (“SEPP 33”) provides the ability to determine whether a development is hazardous or offensive as follows:

**hazardous industry** means a development for the purposes of an industry which, when the development is in operation and when all measures proposed to reduce or minimise its impact on the locality have been employed (including, for example, measures to isolate the development from existing or likely future development on other land in the locality), would pose a significant risk in relation to the locality:

- (a) to human health, life or property, or
- (b) to the biophysical environment.

**offensive industry** means a development for the purposes of an industry which, when the development is in operation and when all measures proposed to reduce or minimise its impact on the locality have been employed (including, for example, measures to isolate the development from existing or likely future development on other land in the locality), would emit a polluting discharge (including, for example, noise) in a manner which would have a significant adverse impact in the locality or on the existing or likely future development on other land in the locality.

The Bioresources Facility is not listed as an industry that may be potentially hazardous or potentially offensive under the NSW Planning document *Hazardous and Offensive Development Application Guidelines Applying SEPP 33* (2011). Section 6.12 of the previously submitted EIS provides a list of chemicals to be used in the building. Hazardous chemicals to be stored and used in the building are as follows:

- Ethanol (flammable goods cabinet)
- Divaflow and Divasheen (cage wash chemicals) (locked cabinet in wash room)
- Clidox / Zydox (hazardous goods cabinet)
- Formalin for fixation (hazardous goods cabinet)
- Small amounts of drugs or chemicals for research use as required
- Total amount of 80 litres of hazardous chemicals stored at the site.

A review of the proposed site and materials stored indicates that all materials are below the threshold for a hazardous industry. Material safety data sheets are provided in Appendix 1.

A small amount of diesel (up to 1,000 litres) will be stored external to the building for use in the generator. The diesel will be stored in a double skinned cell or bund capable of holding 150% of the diesel stored.

Materials proposed to be used in the facility do not exceed the quantity to be considered a significant off site risk in Table 1 of general screening thresholds quantities in Table 3 of the SEPP 33 guidelines (NSW Planning, 2011). All hazardous material used in research will be stored in dedicated storage containers within a building that is accessed by researchers. No further consideration of SEPP 33 is considered necessary.

### 4.4 Aboriginal Heritage

Section 4 of the Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales (Department of Environment, Climate Change and Water, 2010) allows for the code to be used or adapted by proponents to inform the initial assessment of the environmental impacts on an activity on Aboriginal heritage.

The site is considered disturbed and contains existing buildings and infrastructure and an Aboriginal Archaeological Due Diligence Assessment was prepared by an archaeologist for the proposed development. The due diligence assessment found that “...As the due diligence assessment did not identify any Aboriginal objects, sensitive landscape features or areas of potential archaeological deposit within the footprint of the proposed development, it is recommended that the proposed development may proceed with caution without the requirement for an Aboriginal Heritage Impact Permit or need for further investigation works...” (Insite Heritage, 2018).

In response to feedback by the Office of Environment and Heritage, the University of Newcastle confirms it is committed to undertaking the Aboriginal Cultural Heritage Assessment and will comply with all recommendations

of the Aboriginal Cultural Assessment process. Insite Heritage has been engaged to extend their services to prepare an Aboriginal Cultural Heritage Assessment which is now in progress. An advertisement was placed in the Newcastle Herald on 21 August 2018 requesting expressions of interest for the proposed Aboriginal Cultural Heritage Assessment.

Stage 1 letters have also been sent to:

- Local Land Services
- City of Newcastle Council
- Office of the Registrar
- Office of Environment & Heritage
- National Native Title tribunal – Register Search Request
- Native Title Services
- Awabakal Local Aboriginal Land Council.

The archaeologist is currently waiting on responses with contact details of Aboriginal parties who may have an interest in the project so Expression of Interest letters can be sent.

As the site is disturbed and contains existing buildings and infrastructure we request that the Department of Planning and Environment issue draft conditions of consent, including that the proponent comply with recommendations of the Aboriginal Cultural Heritage Assessment.

## 4.5 Noise and Vibration Impact Assessment

An updated noise and vibration impact assessment has been included in this submission report to include residential noise receivers and modification of construction hours (Appendix 2). The revised report assumes that construction/demolition will be completed during daytime only. The assessment is summarised below.

The project proposes the construction of Bioresources Facility at Lot 1, DP1188100, 130 University Drive, Callaghan, NSW, which is located within The University of Newcastle campus. The site is bounded on the north, east and south by existing educational buildings which house the medical, life, biological and general sciences departments of the University and the Newcastle Inner City Bypass is located approximately 60 metres to the west of the site.

Receivers surrounding the project site are mixture of educational and residential and are shown in the figure below. Figure 2 provides a locality plan identifying the position of each of the educational and residential receivers in relation to the project site.

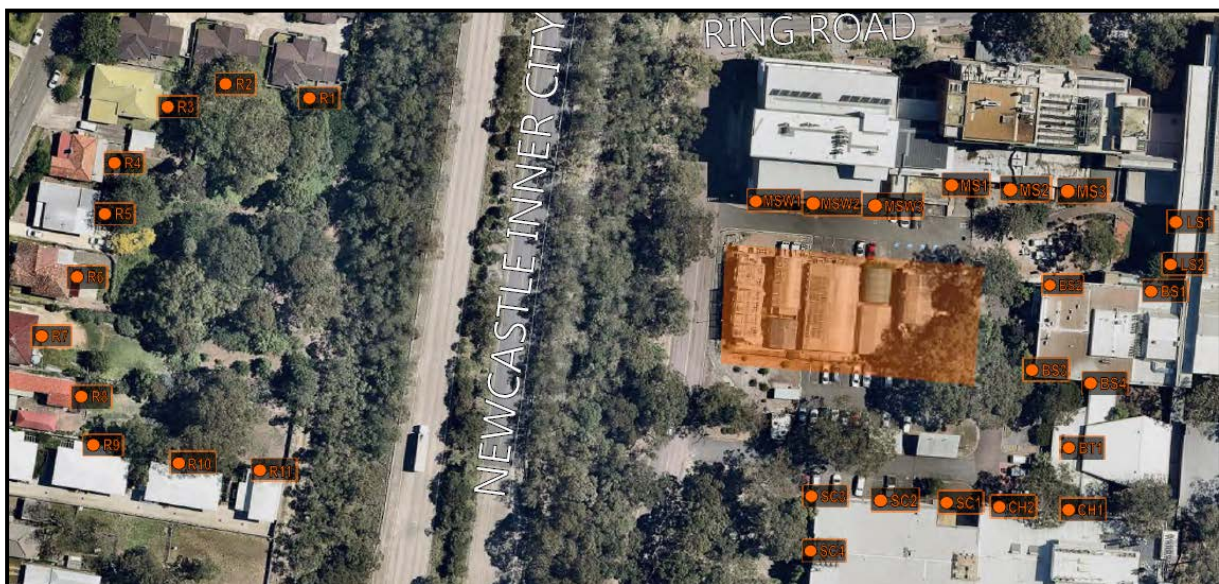


Figure 2 –locality plan showing both residential and educational receivers



#### 4.5.1 Construction Noise

The table below presents noise management levels for residential and non-residential receivers in close proximity to the project in accordance with the Interim Construction Noise Guidelines. For residential receivers the minimum Rating Background Level outlined in Section 2.3 of the Noise Policy for Industry have been adopted as the background noise levels for this assessment.

For educational receivers, it is more practical to assess against an external noise management levels. Therefore, the noise management levels for educational receivers have been adjusted to an external management level assuming 10dB attenuation for a partially open window.

**Table 4.2 – Interim Construction Noise Guidelines Noise Management Level LAeq(15-min)**

Receiver	Receiver Type	Noise Management Level LAeq(15min)
BS1 - BS4, BT1, CH1 - CH2, LS1 – LS2, MS1 - MS3, MSW1 – MSW3, SC1 – SC4	Educational	45 (internal) / 55 (external)
R1-R11	Residential	Day 45 Evening 40 Night 40

#### Construction noise results

Noise modelling included the assessment of construction equipment operating at representative locations for each of adopted construction activities. Results of the modelling for standard construction hours period are presented in Table 14 of Appendix 2 for the worst-case receiver height for assessed receivers.

#### 4.5.2 Continuous vibration

Assessing vibration: a technical guideline was published in February of 2006 by the DECC and is based on guidelines contained in BS 6472 – 1992, Evaluation of human exposure to vibration in buildings (1-80 Hz) and provides guidance on assessing vibration against human comfort. Appendix C of the guideline outlines acceptable criteria for human exposure to continuous vibration (1-80Hz), the criteria are dependent on both the time of activity (usually daytime or night-time) and the occupied place being assessed. Table 7 of Appendix 2 reproduces the preferred and maximum criteria relating to measured peak velocity.

#### 4.5.3 Impulsive vibration

Appendix C of the guideline outlines acceptable criteria for human exposure to impulsive vibration (1-80Hz), these criteria are dependent on both the time of activity (usually daytime or night-time) and the occupied place being assessed. Impulsive vibration (as defined in Section 2.1 of the guideline) is generally associated with infrequent activities that create up to three (3) distinct vibration events in an assessment period e.g. occasional dropping of heavy equipment, occasional loading and unloading. Table 8 of Appendix 2 reproduces the preferred and maximum criteria relating to measured peak velocity

#### 4.5.4 Intermittent vibration

Intermittent vibration (as defined in Section 2.1 of the guideline) is assessed using the vibration dose concept which relates to vibration magnitude and exposure time. Intermittent vibration is representative of activities such as impact hammering, rolling or general excavation work (such as an excavator tracking). Section 2.4 of the Guideline provides acceptable values for intermittent vibration in terms of vibration dose values (VDV). The Acceptable Vibration Dose Values (VDV) for Intermittent Vibration is reproduced in Table 9 of Appendix 2.

#### Vibration assessment results

The major potential sources of construction vibration include vibrating rollers (such as compactors that may be required for earthworks). Equipment and plant have the potential to operate at a minimum offset distance of 20m from the nearest receivers when work occurs at the project site. Generally, rolling would take place at the project site during excavation ground works. Peak levels of vibration from rolling typically occurs as the roller stops to

change direction and a resonance is created as the roller (and vibrator) is stationary. Table 15 of Appendix 2 provides the minimum working distances for the use of various vibration intensive sources to nearby receivers.

A minimum offset distance to receptors of at least 25m or greater is required to satisfy the minimum offset criteria specified in the CNVG and BS7385. Therefore, once the final vibratory plant has been selected a review minimum offset distances should be completed. Where minimum working distances are exceeded, vibration monitoring should be undertaken at the nearest effected receiver. This is to ensure vibration levels satisfy relevant structural criteria at all sensitive receivers. Notwithstanding, to minimise vibration impact during rolling activities, it is recommended that large vibratory rollers be substituted with smaller units or replaced with alternative compaction techniques (i.e. wacker packers), where feasible.

For residential receivers, the offset distance to construction work is >100m, hence relevant vibration criteria are expected to be satisfied.

#### **4.5.5 Operational noise**

Operational noise refers to noise emissions from the project once established and operational and is assessed in accordance with the Noise Policy for Industry (EPA, 2017). Noise levels from operations of the project were assessed to residential receivers to the west of the project (see Figure 2), with predictions identifying noise levels of <30dBA for all receivers. Hence, detailed operational noise predictions were only assessed to university receivers.

##### Operational noise results

A noise modelling assessment of the rooftop mechanical plant noise has been completed. The model assumed that plant is situated within the plant area on the rooftop of the facility building and incorporates acoustic screens and louvres. Results of the modelling are presented in Table 16 of Appendix 2 for both external and internal receiver locations (assuming 10dB loss for a partially opened window).

Results of the noise assessment demonstrate that noise emissions associated with the mechanical plant operating within the plant enclosure would comply with the internal noise criteria for all educational receivers surrounding the project.

##### Road noise intrusion

The exposed facades of the north, west and south of the facility have been assessed for noise from the nearby Newcastle Inner City Bypass for both day and night periods taking into account the transmission loss of the building. The Bioresources Facility will comprise of double glazing or spandrel cladding in galvanised metal planks, therefore an attenuation loss of 30dB has been adopted for this assessment. Table 17 (of Appendix 2) presents a comparison of predicted road traffic noise against the respective day and night internal criteria. Results of the noise assessment demonstrate that internal noise levels for the project would be within the design level range for working laboratories adopting the prescribed construction material if double glazing and spandrel panels or equivalent materials.

#### **4.5.6 Mitigation measures**

##### Noise Mitigation of Construction Activities

The results of the Noise Assessment demonstrate that levels during construction periods may be above the relevant NMLs at several surrounding noise sensitive receivers. External exceedances range from 1dB to 20dB above relevant NMLs at receiver points in close proximity to the project works, assuming partially opened windows. It is noted that received internal noise levels would reduce by an additional 10dB (ie 20dB attenuation overall) if surrounding buildings windows remained closed.

Construction noise levels are predicted to satisfy the highly noise affected criteria of 75dBA LAeq(15min) for all construction activities at all receivers. It may be feasible to implement mobile noise screens (which can achieve noise reductions of up to 8dBA), optimise the positioning of plant and equipment to minimise line of site to receivers or substitute noisy equipment in order to reduce the noise impact at nearby receivers for these activities.

Where it is not feasible to implement noise controls, conducting particular construction activities during periods when neighbouring educational receivers are not occupied (i.e. university holidays) should be considered if justifiable. Given the potential for the predicted noise exceedances, noise mitigation strategies should be

implemented wherever feasible and practicable during standard works. Wherever possible, subject to feasibility and reasonability, the quietest plant and equipment should be utilised in combination with management measures in order to minimise noise impacts.

The primary objective of the noise and vibration management strategy is to minimise noise impacts on surrounding university faculty buildings and residential neighbours. The project manager may adopt the following hierarchical strategy to achieve this objective:

- ensure that construction activities meet construction noise management levels within the allowable hours of operation as far as practicable
- where noise levels are above relevant noise management levels, implement reasonable and feasible best practice noise controls to minimise noise emissions and/or exposure duration at affected receivers
- where the use of best practice noise controls does not adequately address exceedance of noise management levels, adopt alternative measures to minimise impacts on the community.

Australian Standard AS2436-2010 "Guide to Noise Control on Construction, Maintenance and Demolition Sites" sets out numerous practical recommendations to assist in mitigating construction noise emissions. These recommendations include operational strategies, source noise control strategies, noise barrier control strategies, and community consultation. Employing these strategies could potentially result in noise level reductions ranging:

- up to 10dBA in instances where space requirements place limitations on the attenuation options available; or
- to potentially over 20dBA where equipment controls (enclosures, silencers, etc) can be combined with noise barriers and management techniques (e.g. avoidance of clustering).

Should compliance noise monitoring indicate exceedances of the noise criteria, a combination of comprehensive noise mitigation treatments (i.e. noise barriers, equipment enclosures, silencers, regular equipment maintenance, etc) and consultation with university representatives the local community will be considered to manage exceedances. Further descriptions of management measures and mitigation options are provided for specific construction activities and work areas in the following sections.

### Noise Management Recommendations

During construction and any residual demolition activities, the following mitigation strategies to manage noise include:

- Construction will occur during recommended standard and out of hours periods for construction. Note, although are not mandatory, strong justification is required to work outside of normal construction hours. Notwithstanding, construction works during non-standard hours may be required for this project to minimise impact on surrounding educational receivers.

Recommended Hours for Construction:

- Normal construction
- Monday to Friday - 7am to 6pm
- Saturdays - 8am to 1pm
- Sundays or Public Holidays - No construction

Out of Hours Period 1

- Monday to Friday - 6pm to 10pm
- Saturdays – 7am to 8am and 1pm to 10pm
- Sundays or Public Holidays - 8am to 6pm

Out of Hours Period 2

- Monday to Friday – 10pm to 7am
- Saturdays – 10pm to 8am
- Sundays or Public Holidays – 6pm to 7am

These recommended hours do not apply in the event of direction from police, or other relevant authorities, for safety reasons or where required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm.

- It may be feasible to implement mobile noise screens (which can achieve noise reductions of up to 8dBA), optimise the positioning of plant and equipment to minimise line of site to receivers or substitute noisy equipment in order to reduce the noise impact at nearby receivers for these activities
- Where it is not feasible to implement noise controls, conducting particular construction activities during periods when neighbouring educational receivers are not occupied (ie university holidays) should be considered if justifiable
- Given the potential for the predicted noise exceedances, noise mitigation strategies should be implemented wherever feasible and practicable during standard works. Wherever possible, subject to feasibility and reasonability, the quietest plant and equipment should be utilised in combination with management measures in order to minimise noise impacts
- The primary objective of the noise and vibration management strategy is to minimise noise impacts on surrounding university faculty buildings and residential neighbours. The project manager may adopt the following hierarchical strategy to achieve this objective:
  - ensure that construction activities meet construction noise management levels within the allowable hours of operation as far as practicable
  - where noise levels are above relevant noise management levels, implement reasonable and feasible best practice noise controls to minimise noise emissions and/or exposure duration at affected receivers
  - where the use of best practice noise controls does not adequately address exceedance of noise management levels, adopt alternative measures to minimise impacts on the community.
- Toolbox and induction of personnel prior to shift to discuss noise control measures that may be implemented to reduce noise emissions to surrounding receivers
- Training (of employees to conduct quieter work practices)
- equipment which is used intermittently is to be shut down when not in use
- Undertake noise intensive construction or demolition activities outside of university hours, or in university holiday periods
- Where work is undertaken outside of school hours, noise mitigation options should be thoroughly investigated by the contractor prior to these works and validated by attended noise monitoring
- Where possible, machinery will be located/orientated to direct noise away from the closest sensitive class rooms
- Undertake regular maintenance of machinery to minimise noise emissions. Maintenance will be confined to standard daytime construction hours and where possible, away from noise sensitive receivers
- The quietest suitable machinery reasonably available will be selected for each work activity
- The offset distance between noisy items of plant/machinery and nearby sensitive receivers and classrooms will be maximised
- Queuing of vehicles is not to occur adjacent to any occupied classroom
- Where queuing is required, for example due to safety reasons, engines are to be switched off to reduce their overall noise impacts on receivers;
- Where practicable, ensure those noisy plant/machinery are not working simultaneously in close proximity to classrooms
- Where possible, all plant are to utilise a broad band reverse alarm in lieu of the traditional high frequency type reverse alarm
- Minimising the need for reversing or movement alarms
- Conduct noise monitoring throughout the proposal work.

#### Vibration Management Recommendations

In general, to minimise vibration impacts during construction/demolition activities, it is recommended that vibrating plant selection takes into account relevant offset distances to receivers to achieve both the human comfort and structural damage criteria.

For particularly sensitive educational receivers, it is recommended that vibration monitoring should be considered so that vibration levels from the project can be quantified and proactively managed against relevant structural criteria.

## 4.6 Stormwater and sediment and erosion control plans

The project engineer has provided the following information in relation to stormwater management.

The carpark is existing and does not form part of this development proposal, as such stormwater quality provisions within the carpark are outside of the requirements for this development and have not been provided. Any works undertaken on the carpark are only for the purpose of repairing damage arising from construction, or to reinstate the existing drainage regime where impacted.

The proposed development requires the removal of an existing stormwater pipe which currently drains the carpark located on the southern side of the new building. The proposed new KIP is simply replacing an existing pit which will become damaged during construction activities. This pit will also allow stormwater to be diverted around the development, thus maintaining the existing stormwater runoff regime from the existing carpark.

An updated sediment and erosion control plan has been included (Appendix 3) as part of a more detailed design stage. The plan now includes diversion mounds and drainage swales and sediment sandbags. It is considered that these measures along with the other sediment and erosion measures that will be implemented will ensure that soil and drainage on site will be controlled by the contractors to ensure that appropriate erosion and sediment control will occur.

## 4.7 Section 94A contributions

As outlined in the EIS, the proposal seeks not to pay Section 94A contributions as the proposed building will not generate additional demand for community services and facilities.

The proposed Bioresources facility could be considered fit out or refurbishment of an existing development, where there is no enlargement or intensification of the current land use and as such does not create additional demand for community facilities or services. The proposal is a new building for existing staff and students that will provide technical and functional capability beyond that of existing facilities, in response to emerging trends in biomedical research and will not generate additional demand for community services or facilities.

Furthermore, collection of Section 94A contributions for community services or facilities for the proposed development involves duplication as the University provides extensive services and facilities for its students in the form of open space, recreation, entertainment, student engagement and public good of ongoing education of the community. The University of Newcastle funds provision and maintenance of, and improvement to, a range of facilities and services at Callaghan campus including:

- Community facilities/services – libraries, pools, sporting fields, affordable student accommodation, public venues (Great Hall, Griffith Duncan Theatre) and Art Gallery (University Gallery)
- Public facilities/services - Open Space and recreation facilities
- Infrastructure – all internal roads and footpaths, provision of bike hubs and end of trip facilities
- Environment – Bush regeneration and Management and Wetlands (on University and bordering land).

Section 4.33(1)(b) of the EP&A Act states a consent authority must not impose a condition on its consent to a Crown development application, except with the approval of the applicant or the Minister. The University of Newcastle is prescribed as a public authority as such the application may be considered Crown development and conditions of consent may be reviewed by the University prior to being imposed on the consent. It is requested that any conditions to be reviewed do not include a requirement for Section 94 contributions.

## 4.8 Bushfire threat assessment

The bushfire assessment report has been updated (Appendix 4) to reflect the new bushfire prone land maps as released by Newcastle City Council. It is considered that no changes have occurred to the findings of the bushfire report and that compliance with Planning for Bushfire is achievable.

Additional mitigation measures are provided to address comments from NSW Rural Fire Service.

## 4.9 Employment

It is confirmed that it is anticipated that 63 equivalent full time position in consultancy and construction activities to be created for a 17 month period (Wilde and Woollard, 2018 [Appendix 19 of the EIS]).

## 4.10 Arborist

An Arboricultural Impact Assessment Report has been prepared to consider trees within the proposed building footprint and 5 metres of the proposed development (Appendix 5). The Arboricultural report also considered infrastructure such as the chilled water storage pump and fire hydrant electric pump buildings.

Based on the results of a visual inspection of these trees in relation to the proposed plans the following outcomes are recommended:

1. Removal of Tree Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9,10, 11, 12, 13, 14 & 15.

Reason: The trees are within the development footprint and such their removal would be necessary to facilitate the development as proposed. It is considered that any re-design options that will enable them to be retained, survive the impacts of construction and achieve a desired design outcome would not be possible without a significant reduction in the size of the overall development footprint.

2. Removal of Tree Nos. 19, 20, 21, 22, 23, 25 32 & 33.

Reason: Due to the close proximity of construction and extent of encroachment into their TPZ's and SRZ's the removal of these trees would be necessary as they will be adversely impacted upon by the development that will be detrimental stability and/ or their overall condition.

3. Retention of Tree Nos. 17, 18 & 24.

Reason: It is expected that encroachment will be less than 10% of the total TPZ and that as the area lost to encroachment is outside the SRZ and can be compensated for elsewhere and contiguous with the TPZ the impacts of the development should be tolerated by the trees.

4. Retention of Tree Nos. 16, 26, 27, 28, 29, 30 & 31.

Reason: Construction is not expected to encroach within the TPZ of these trees. With the implementation of Tree Protection Measures and Tree Protection Zone Specification the trees should not be impacted upon by the proposed development.

5. Implementation of Tree Protection Measure & Tree Protection Zone Specification.

Reason: To provide the developers with a guide so that the trees to be retained during the development of this site can be protected whilst construction is undertaken.

6. Tree Protection Measures must comply with Australian Standard 4970 – 2009 Protection of Trees on Development Sites.

Reason: To ensure best practices are implemented for the planning and protection of trees on or within close proximity to a development site.

7. Any works within a nominated Tree Protection Zones must comply with Australian Standard 4970 – 2009 Protection of Trees on Development Sites.

Reason: To ensure best practices for the protection of trees to be retained are followed.

8. Tree work to be carried out by a qualified tree contractor in accordance to Australian Standard 4373 –2007 and in accordance with the Code of Practice Amenity Tree Industry August 2007.

Reason: The Standard describes methods for pruning of trees and to encourage correct and uniform practices in order to minimize the impact of pruning on trees.

9. Refer to the Landscape Management Implementation Plan prepared by Anderson Environmental and Planning in relation to replanting requirements to compensate for tree removal.

Reason: To ensure compensatory works for the clearing or pruning of vegetation is to be undertaken in accordance with the provisions for the Callaghan Campus in the Urban Forest Technical Manual.

10. Ensure habitat and /or ecological significance of trees has been taken into consideration before any tree identified as a habitat tree is removed.

Reason: To ensure the safety, protection and relocation of any inhabitants has been considered.

## 4.11 Parking and Traffic

The plan in Appendix 6 provides the location of proposed construction parking. Construction parking will occur in the existing car park currently utilised by researchers associated with the glass houses that have been approved for demolition or relocation separately. The review of construction traffic impacts (Appendix 7) found the following:

- Workers associated with the project will be able to park on site in the area formally used as parking for the previous use on the construction site. This parking area was formally used by staff and students for the former use (glasshouses that have been relocated subject to a separate REF) and will have adequate capacity to cater for the parking demands created by the construction work.
- As part of the construction work, construction workers will be encouraged to car pool and use public transport to access the site rather than utilise individual vehicles to access the site, which will reduce the on-site parking demands as well as reduce the volume of traffic associated with the construction work. There is good public transport access available to the site.
- Deliveries associated with construction material and supplies will not be high and will be managed to reduce the deliveries during the traditional peak periods. This will reduce the impacts upon the external road links and intersections during the critical morning and afternoon peak periods.
- Construction plant will be delivered to the site at the commencement of the project and shall remain on the site for the duration of the project, reducing the extent of construction traffic movements. The movement of this plant will be completed outside of the peak periods on the external road network to reduce their impacts.

Overall it is considered that the construction traffic impacts will be acceptable and with appropriate on-site controls the impact during the traditional morning and afternoon peak periods will be minimal (Appendix 7).

Additional mitigation measures are provided to reflect the submissions in relation to existing bus services, pedestrian and bicycle rider movements in the Construction and Pedestrian Traffic Management Plan.

## 4.12 Odour

RCA has revised the odour modelling to consider changes to the stack details and is summarised as follows (Appendix 8).

The requested amendment was due to revised design details proposed at the facility:

- All stack heights to be 3.1 metres above the roof plant parapet
- Additional stacks that may be producing significant odours (previously only 2 stacks, see below) and representative locations of these stacks on the roof
- Representative flow rates and stack diameters.

This odour model still follows the full odour impact assessment as carried out by RCA in April 2018.

## Methodology

RCA used the same modelling approach as used in the previous April 2018 assessment which is in accordance with NSW EPA methodology. It is not the intention of this report to reproduce all of the modelling methods and assumptions used in the revised odour modelling, however the modified design details that RCA included in the revised model configuration were:

- Eight (8) stacks positioned on the roof (and instead of the two (2) stacks previously modelled by RCA). These were comprised of significant odour sources from autoclaves (3 stacks) and animal rack processes (5 stacks)
- Some other exhaust odours were not included (i.e. exhausts other than the eight mentioned above) as their odour contributions to the external environment were considered to be of low significance (due to the low odour rates expected and the intermittent running times) for example the rack washing process
- The eight (8) stacks used in the revised modelling were positioned at the locations shown in a drawing supplied to RCA (drawing no. M-OR-001, April 2018). Representative flow rates and diameters provided in that drawing were also used in the modelling parameters.

For this assessment, the modelling inputs that were not changed since the initial assessment were:

- The odour rates from the previous study were still used in this revised assessment and to provide a worst case odour modelling scenario
- The same maximum number of autoclave cycles from the previous study; total of 56 and over a full week, were used in this revised assessment and allocated between the three (3) autoclave stacks.

## Results

The results of the revised odour modelling, for operations from the proposed facility at the Callaghan NSW site, are shown in Table 1 (of Appendix 8).

The modelling results indicate that for the proposed operations and using worst case odour emission data the ground level odour concentrations are unlikely to exceed the odour impact criteria of 2.0 odour units (OU's) for the three residential receptors nominated. Furthermore, this criterion is considered unlikely to be exceeded at any other residences in the vicinity of the campus.

The results are similar to those obtained in the previous study, which indicates that the revised design details will not adversely impact on odours experienced at ground level and at residences. These outcomes are based on the following important assumptions and considerations:

- All stack heights to be 3.1 metres above roof plant parapet
- All "animal rack" processes being exhausted to the external environment are running at the same time
- Odour data used as per the previous study, i.e. odour rates used in the modelling were considered "worst case" from all animal processes to be consistent with the conservative approach previously adopted.

It should be noted that the odour criteria applies at nearest sensitive receptors outside the site boundary. For the receptor locations within the campus, the criterion of 2.0 OU does not apply but it can be used as a guide because the criteria "have been designed to take into account the range of sensitivity to odours within the community and to provide additional protection for individuals with a heightened response to odours".

RCA provides the following discussion about the odour results within the campus:

- Odour levels are likely to be just noticeable by a person and not offensive or objectionable
- The odour levels that are detected are likely to be mostly in close proximity to the proposed facility or during 'worst case' weather conditions such as a cold, still morning.

## Conclusion

The results of the revised odour modelling showed the operations within the proposed Bioresources facility will not adversely impact odour levels at the nearest sensitive receptors (i.e. the residences) with the incorporation of the revised design details such as stack heights at 3.1 metres above the roof plant parapet level. This modelling outcome was achieved by using worst case data and a conservative approach throughout and the expected significant odour emissions. Further, odour levels within the campus were predicted to be, at worst just noticeable by a person and not offensive or objectionable.



## 4.13 Architectural Design

The proposed Bioresources Facility is a purpose-built research building for the University of Newcastle. Latest architectural plans are presented in Appendix 9.

The design responds to the specific functional and operational requirements of the scientific enquiry taking place within whilst also creating a simple and elegant architectural form appropriate for site, surrounding context and intended purpose. The Ground Floor provides on grade Entry and Back of House access, in addition to Administration / Amenity and Research space. Visual transparency is maximised within Entry and Administration zones, whilst being carefully controlled through the rest of the facility due to the impact light can have on facility operations and research.

The First Floor façade curves provide an opportunity for controlled access to natural light, improving amenity within circulation space whilst also providing a suitable write-up | break out space for occupants. Circulation zones have been carefully considered to address operational controls required throughout the facility. Equitable access is available throughout the facility via corridor connections to both Ground Level (primary Entry) and Level 01 (secondary Entry). Lifts have been located at the western end of the facility to address operational requirements and can be utilised from both Ground and Level 01 by all occupants as required.

The design locates the majority of service requirements on the roof to provide maximum operational efficiency to research floor plates whilst also minimising the building footprint. This type of facility requires extensive services, and therefore by locating on the roof they can be consolidated, minimising the impact on the site. The roof plant is fully enclosed and set back from the Level 01 façade edge to minimise visual impact from both street level and when observed from surrounding neighbouring buildings. The roof plant façade matches typical Ground Level finishes, creating a receding mass when viewed relative to the more prominent Level 01 glazed screen.

An appropriate design response has been achieved when all aspects of functional and operational requirements are considered, in addition to site and context.

## 4.14 Landscape Design

Revised landscape plans are presented in Appendix 10. The plans present a range of species to create varying heights, colour and form to integrate the proposed building into the existing environment. The landscape plan presents a range of trees, shrubs, grasses and ground covers to provide varied features across the external parts of the building.

Regarding Planning for Bush Fire Protection 2006 it is our understanding that the landscape design proposed responds to Asset Protection Zones and Landscaping and Property Maintenance through:

- Site location
  - Paved Lane and Medical Sciences buildings immediately to the north
  - Biological Sciences building adjacent to the east
  - Paved car park and Chemistry building to the south
  - Campus Ring Road and Newcastle Bypass (major arterial road) to the west
  - Surrounding access paths
  - Minimal 'hazard' type vegetation in close proximity to the building
- New plant selection
- Ongoing landscape maintenance in accordance with APZ requirements
- Roads, laneways, paved areas, paths and open areas (free of vegetation) around the building assist in providing clear access to fire fighting resources with minimal or no vegetative fuel load
- New vegetation selection minimises species that provide significant fuel load.

## 5. MODIFICATIONS TO THE PROPOSAL

### 5.1 Introduction

A review of the submissions has resulted in minimal changes to the project. Changes are proposed to the environmental mitigation measures presented in the EIS. These changes do not alter the original findings of the EIS that the proposal will not have a significant impact on the environment, including threatened species, populations or ecological communities, or their habitats. Approval is not required under the EPBC Act.

### 5.2 Proposal Changes

Proposed changes to the building involve the ventilation stacks on the roof level. A total of 12 exhaust stacks will be provided to the building. The stacks are approximately 3.1 metres above the roof plant parapet height. The roof plant parapet is proposed to be 5.5 metres and as such the roof exhaust stacks will terminate approximately 8.6 metres above the roof plant finished floor level. Changes proposed are to ameliorate odours associated with potential stack plume. As presented in Section 4.12 and Appendix 8, the proposed development will not adversely impact odour levels at the nearest sensitive receptors (i.e. the residences) and odour levels within the campus were predicted to be, at worst just noticeable by a person and not offensive or objectionable.

### 5.3 Environmental Management Changes

#### 5.3.1 Deleted Environmental Management Measures

Section 10.2 Traffic and Transport:

- Parking for the construction staff will be managed through the Construction Traffic Management Plan.

Section 10.5 Air Quality

- Increase stack heights from the minimum of 6 metres (assumed minimum for the purposes of this assessment). It should be noted that the actual stack heights will be determined by further odour and plume dispersion investigations during the design process.

#### 5.3.2 Modified Environmental Management Measures

Section 10.3 Soils, Geology and Contamination and 10.4 Water Quality and Flooding:

- Erosion and sediment control will be in accordance with *Managing Urban Stormwater: Soils and Construction "The Blue Book"*, Landcom (2004) and the plan in Appendix 3 of the Response to Submissions (September 2018).

#### 5.3.3 Additional Environmental Management Measures

Additional environmental management measures are as follows:

##### Traffic and Transport

- Construction will occur during recommended standard and out of hours periods for construction
- Construction vehicles will park on the construction compound shown in Appendix 6 of the Response to Submissions
- A Construction and Pedestrian Traffic Management Plan (CPTMP) will be prepared in consultation with Roads and Maritime Services and Newcastle City Council, prior to the commencement of works on site
- RMS have the right to review the CPTMP and can make changes in the interest of road safety and network efficiency
- All works associated with the project shall be at the cost to the developer, with no cost to RMS
- Bus services, pedestrian and bicycle rider movements be maintained at all times during the construction, particularly during university peak times.

## Noise

- Construction will occur during recommended standard and out of hours periods for construction. Note, although are not mandatory, strong justification is required to work outside of normal construction hours. Notwithstanding, construction works during non-standard hours may be required for this project to minimise impact on surrounding educational receivers.

Recommended Hours for Construction:

- Normal construction
- Monday to Friday - 7am to 6pm
- Saturdays - 8am to 1pm
- Sundays or Public Holidays - No construction

Out of Hours Period 1

- Monday to Friday - 6pm to 10pm
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Out of Hours Period 2

- Monday to Friday – 10pm to 7am
- Saturdays – 10pm to 8am
- Sundays or Public Holidays – 6pm to 7am

These recommended hours do not apply in the event of direction from police, or other relevant authorities, for safety reasons or where required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm.

- It may be feasible to implement mobile noise screens (which can achieve noise reductions of up to 8dBA), optimise the positioning of plant and equipment to minimise line of site to receivers or substitute noisy equipment in order to reduce the noise impact at nearby receivers for these activities
- Where it is not feasible to implement noise controls, conducting particular construction activities during periods when neighbouring educational receivers are not occupied (ie university holidays) should be considered if justifiable
- Given the potential for the predicted noise exceedances, noise mitigation strategies should be implemented wherever feasible and practicable during standard works. Wherever possible, subject to feasibility and reasonability, the quietest plant and equipment should be utilised in combination with management measures in order to minimise noise impacts
- The primary objective of the noise and vibration management strategy is to minimise noise impacts on surrounding university faculty buildings and residential neighbours. The project manager may adopt the following hierarchical strategy to achieve this objective:
  - ensure that construction activities meet construction noise management levels within the allowable hours of operation as far as practicable
  - where noise levels are above relevant noise management levels, implement reasonable and feasible best practice noise controls to minimise noise emissions and/or exposure duration at affected receivers
  - where the use of best practice noise controls does not adequately address exceedance of noise management levels, adopt alternative measures to minimise impacts on the community.

## Flora, Fauna and Bushfire

- Landscaping will be maintained in accordance with principles of Appendix 5 of Planning for Bushfire Protection 2006
- Implementation of Tree Protection Measure & Tree Protection Zone Specification
- Tree Protection Measures must comply with Australian Standard 4970 – 2009 Protection of Trees on Development Sites
- Any works within a nominated Tree Protection Zones must comply with Australian Standard 4970 – 2009 Protection of Trees on Development Sites

- Tree work to be carried out by a qualified tree contractor in accordance to Australian Standard 4373 – 2007 and in accordance with the Code of Practice Amenity Tree Industry August 2007
- Refer to the Landscape Management Implementation Plan prepared by Anderson Environmental and Planning in relation to replanting requirements to compensate for tree removal
- Ensure habitat and /or ecological significance of trees has been taken into consideration before any tree identified as a habitat tree is removed
- The following asset protection zones are required:
  - 20 metres on the northern, western and southern elevations
  - 25 metres on the eastern elevation
- Water, electricity and gas are to comply with section 4.1.3 of Planning for Bushfire Protection 2006
- The existing evacuation and emergency plan for the university to be updated to into the bioresource facility and to be consistent with development.

#### Heritage

- Comply with recommendations of the Aboriginal Cultural Heritage Assessment.

#### **5.3.4 Revised Environmental Management Measures**

A list of all environmental mitigation measures relevant to the project is provided in Appendix 11. All environmental mitigation measures will be implemented.

## 6. CONCLUSION

The Submissions Report has addressed submissions received during exhibition of the EIS for the Bioresources Facility. It is considered that the report has addressed all submissions and provided a response to issues raised. The conclusion of the EIS that the proposal will not have a significant impact on the environment, including threatened species, populations or ecological communities, or their habitats is not changed. Approval is not required under the EPBC Act.

We request that you issue draft conditions of consent for review by the University of Newcastle as outlined in this document.



## APPENDICES



## APPENDIX 1

### Material Safety Data Sheets



## APPENDIX 2

### Revised Noise and Vibration Impact Assessment





## APPENDIX 3

### Revised Erosion and Sediment Control Plan



## APPENDIX 4

### Revised Bushfire Threat Assessment



## APPENDIX 5

### Arborist Report



## APPENDIX 6

### Construction Parking Plan



## APPENDIX 7

### Assessment of Construction Traffic Impacts



## APPENDIX 8

### Revised Odour Modelling



## APPENDIX 9

### Revised Architectural Plans



## APPENDIX 10

### Revised Landscape Plans





## APPENDIX 11

### Revised Environmental Mitigation Measures