Upper South Creek

Advanced Water Recycling Centre and Pipelines

Community Agreement – AWRC Extended Working Hours

From 09 July 2025 for 28 days

(Rev D)

EPL 21800

Contents

*General Construction denotes the following – *structure construction* and *electrical and mechanical installation* in accordance with the activities specified in the CNVIS.

Introduction

The Upper South Creek Advanced Water Recycling Centre (AWRC) (the project) has been proposed to support the population growth and economic development of the Western Sydney Aerotropolis Growth Area (WSAGA or Aerotropolis), South West Growth Area (SWGA) and the new Western Sydney International Airport. The project will provide wastewater services to Western Sydney to produce high-quality treated water for non-drinking reuse and for release to local waterways. John Holland has been appointed by Sydney Water to deliver the project works, with detailed design and construction for treating a daily wastewater flow of up to 35ML/day.

John Holland has obtained Environment Protection Licence (EPL 21800) from the NSW Environment Protection Authority for the construction of the project and has prepared the following written report for submission to the EPA as John Holland are seeking to undertake work outside of approved construction hours following community consultation and agreement (EPL condition E1).

Scope of Works and Further Details

John Holland proposes to continue extending the standard construction hours specified in EPL 21800 condition L5.1 at the AWRC plant site on Paper Road, Kemps Creek via agreement from the community, in accordance with condition E1 of the licence. The project is seeking a continued community agreement under the following 4 scenarios:

Scenario	Day	Time (proposed to be continued and approved under this agreement)	Activity
Scenario 1	Monday to Friday	5am – 7am	General Construction* (no change from previously approved community agreement)
Scenario 2	Saturday	5am - 8am and 1pm – 6pm	General Construction* (no change from previously approved community agreement)
Scenario 3	Monday to Friday	6pm – 5am	Asphalt Works and/or Mechanical and Electrical Fit Out
Scenario 4	Sunday	6am – 6pm	Asphalt Works and/or Mechanical and Electrical Fit Out

The primary purpose of this community agreement is to enable the project to better manage traffic impacts on Clifton Avenue and Elizabeth Drive. Extended hours will enable deliveries and vehicle arrival times to be further spaced out, minimizing congestion, and reducing the frequency and quantity of vehicles occupying the 2 key roads (Clifton and Elizabeth) that are already under pressure from surrounding major projects.

Also, extending the working hours of key construction activities will enable selected activities to occur concurrently and/or during hours not previously permitted under condition L5.1 and as such will enable the overall duration of the works to be completed faster and impact to the community reduced.

This revision of the AWRC Extended Working Hours community agreement represents the information presented by John Holland to document ongoing community engagement and agreement required under condition E1.7 of EPL 21800.

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E1 Community Agreement

Condition E1.1

Work outside standard construction hours – community consultation and agreement.

The licensee may work outside standard construction hours (as defined in L4.1) in circumstances other than those permitted under conditions L4.3, L4.4, or any other condition of this licence if the Licensee:
a) undertakes community consultation and agreement as described in E1.2;

- The project has undertaken community consultation with the affected residents that were identified in the noise model.

b) submits to the EPA a written request to work outside the standard construction hours attaching information set out in E1.3; and

- This document details information to work outside the standard construction hours. Specifically, the project is seeking approval to work for the following additional hours:

Scenario	Day	Time (proposed to be continued and approved under this agreement)	Activity
Scenario 1	Monday to Friday	5am – 7am	General Construction* (no change from previously approved community agreement)
Scenario 2	Saturday	5am - 8am and 1pm – 6pm	General Construction* (no change from previously approved community agreement)
Scenario 3	Monday to Friday	6pm – 5am	Asphalt Works and/or Mechanical and Electrical Fit Out
Scenario 4	Sunday	6am – 6pm	Asphalt Works and/or Mechanical and Electrical Fit Out

- The project would like to include the following hours for the next 7 months and the community will be consulted every 28 days to ensure ongoing support. This revision of the AWRC Extended Working Hours community agreement represents the information presented by John Holland to document ongoing community engagement and agreement required under condition E1.7 of EPL 21800

c) *obtains approval by the EPA to work outside standard construction hours. The EPA may, in exercising its discretion to approve the works outside standard construction hours, review whether the licensee has obtained community agreement. Specifically, whether a substantial majority of the individual Noise Sensitive Receivers who together comprise the Community Affected Catchments and were contacted has consented to the planned works out of standard hours.*

- John Holland notes that approval must be obtained from the EPA to undertake the work proposed in this community agreement.

Scenario	Impacted residents	Response provided by impacted resident?
Scenario 1	8 impacted residents	6/7 Consented ^
Scenario 2	8 impacted residents	6/7 Consented ^
Scenario 3	8 impacted residents	6/7 Consented ^
Scenario 4	8 impacted residents	6/7 Consented ^

^ 7 out of 8 impacted residents are contactable with a resident residing at the residence to liaise with. 1 out of 8 impacted residents does not have a resident residing at the residence to liaise with and is not residential and is used intermittently as a training facility and usually during daytime hours. Of the 7 contactable residents, 6 provided their consent and 1 did not respond to John Holland's 3 attempts to obtain consent.

Condition E1.2

Requirements for community consultation and agreement:

Any community consultation and agreement undertaken with respect to the proposed out of hours works (OOHW) must:
a) be prepared and implemented in accordance with the Interim Construction Noise Guidelines (DEC 2009), the Noise Policy for Industry (EPA, 2017) and AS2436-2010: Guide to noise and vibration control on construction, demolition and maintenance sites;

- The Out of Hour Works Permit and community consultation detailed in Appendix 1 and Appendix 2 respectively has been prepared in accordance with the Project approved Noise and Vibration CEMP sub-plan (NVCSP) which considers the guidelines above.

b) include consultation of all noise sensitive receivers within the Community Affected Catchments. This includes Noise Sensitive Receivers that have declined to participate in previous agreements unless a community member has explicitly requested not to be involved in any future consultation about future OOHW;

- A broader overview of the AWRC site and its surrounding noise sensitive receivers is provided in Figure 1, with a more detailed view of the noise sensitive receivers included in Figures 1A, 1B and 1C.
- Scenario 1 and 2: As detailed in the project noise model (Gatewave Renzo Tonin - Appendix 3), 8 residences were identified as being impacted by the proposed works and are presented in Figure 1A, 1B and 1C.
    1. 146B CLIFTON AVENUE, KEMPS CREEK, NSW (14 db (A) above NML)
    2. 203-229 CLIFTON AVENUE, KEMPS CREEK, NSW (14 db (A) above NML)
    3. 230-234 CLIFTON AVENUE, KEMPS CREEK, NSW (14 db (A) above NML)
    4. 919-929 MAMRE ROAD, KEMPS CREEK, NSW (9 db (A) above NML)
    5. 257 CLIFTON AVENUE, KEMPS CREEK, NSW (9 db (A) above NML)
    6. 235-245 CLIFTON AVENUE, KEMPS CREEK, NSW (9 db (A) above NML)
    7. 258 CLIFTON AVENUE, KEMPS CREEK, NSW (10 db (A) above NML)
    8. 1669A ELIZABETH DRIVE, BADGERYS CREEK, NSW (7 db (A) above NML)
- Scenario 3 and 4: As detailed in the project noise model (Gatewave Renzo Tonin - Appendix 3) 8 residences were identified as being impacted by the proposed works and are presented in Figure 1A, 1B and 1C.
    1. 146B CLIFTON AVENUE, KEMPS CREEK, NSW (10 db (A) above NML)
    2. 203-229 CLIFTON AVENUE, KEMPS CREEK, NSW (10 db (A) above NML)
    3. 230-234 CLIFTON AVENUE, KEMPS CREEK, NSW (10 db (A) above NML)
    4. 919-929 MAMRE ROAD, KEMPS CREEK, NSW (5 db (A) above NML)
    5. 257 CLIFTON AVENUE, KEMPS CREEK, NSW (6 db (A) above NML)
    6. 235-245 CLIFTON AVENUE, KEMPS CREEK, NSW (6 db (A) above NML)
    7. 258 CLIFTON AVENUE, KEMPS CREEK, NSW (5 db (A) above NML)
    8. 1669A ELIZABETH DRIVE, BADGERYS CREEK, NSW (4 db (A) above NML)

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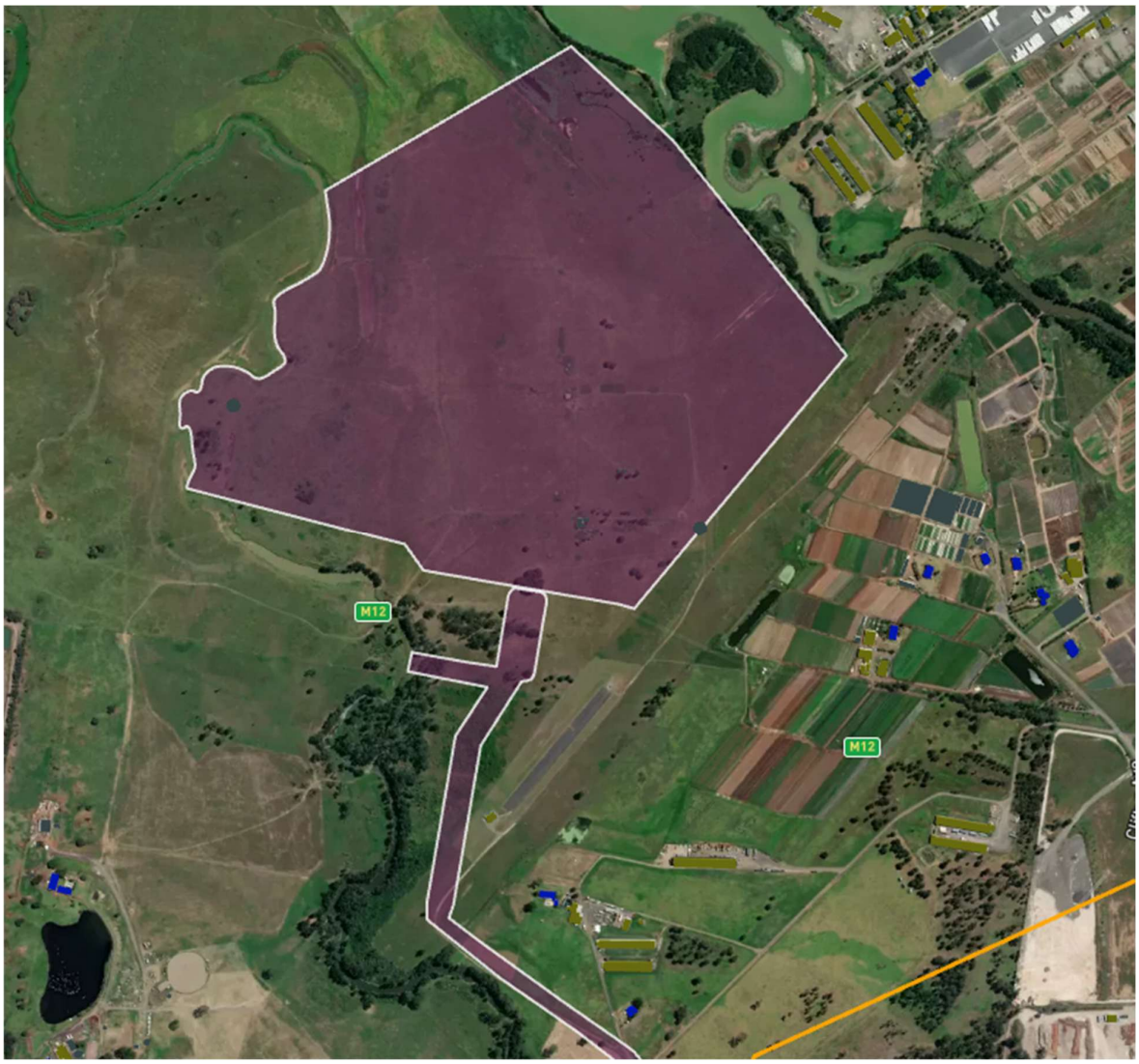

Figure 1: Broader overview of the AWRC site and its surrounding noise sensitive receivers

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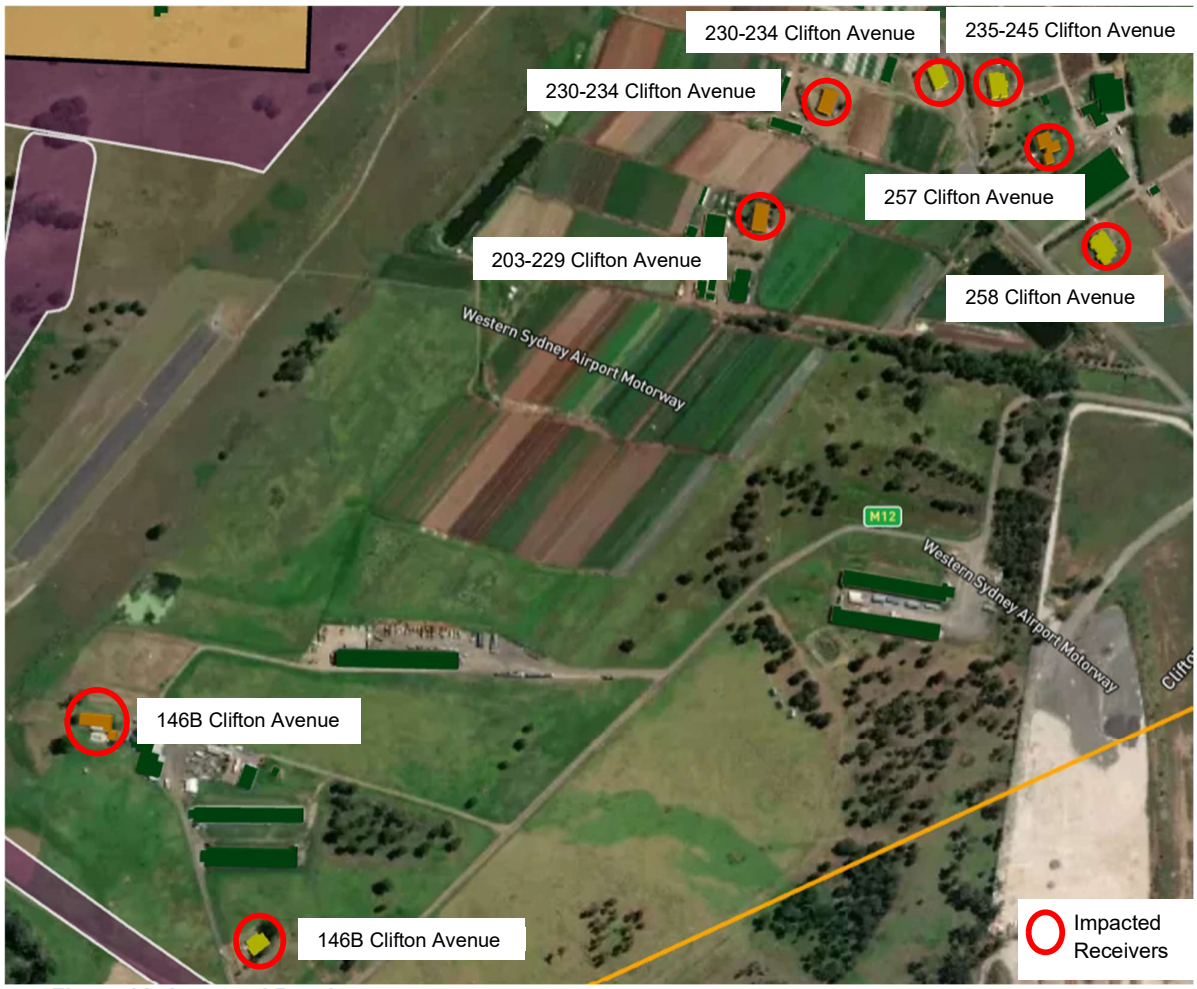

Figure 1A: Impacted Receivers

Figure 1B: Impacted Receivers

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Figure 1C: Impacted Receivers

- All residents have been consulted and have provided their consent for the works to take place. The residents did not raise any objections or issues with the works moving forward. Refer to Appendix 2 for further details.

c) *ensure that the noise sensitive receivers understand the nature of the works and any predicted impacts, including that consideration is made of additional requirements relevant to the needs of culturally and linguistically diverse Noise Sensitive Receivers, and include details for interpreting services for languages other than English where required.*

- The project team has a pre-existing relationship with all of the sensitive receivers and there was no requirement for translating and interpreting services to support the conversation about the proposed works for 7 of the residents. The 8th receiver (230-234 Clifton Avenue) is culturally and linguistically diverse; the team uses text message to communicate as he can use Google Translate.
- Appendix 2 documents the consultation that was done with each resident.

d) include in the community consultations with Noise Sensitive Receivers the following information:
i. the actual works proposed;

- Scenario 1 and 2: The project is proposing to start general construction (includes concrete pour) at 5am on Monday to Fridays and 5am – 8am, 1pm to 6pm on Saturdays. This will allow the construction team to coordinate arrival and departure times of construction traffic to/from site which will reduce construction traffic impacts to Elizabeth Drive and Clifton Avenue. It will also reduce impacts to nearby residents and road users as the total number of workforce on the site at any given time will be reduced thus mitigating potential health and safety risks to workforce caused by interaction with traffic and plant onsite.
- Scenario 3 and 4: The project is proposing to start mechanical and electrical works at 6pm to 5am on Monday to Fridays and 6am to 6pm on Sundays. Much of the mechanical and electrical work to be undertaken for the remainder of the project is inside enclosed buildings and/or shielded by structures on site and greatly assist with mitigating noise. The works also includes occasional asphalting works on Paper Road and within the project boundary. Due to the congestion in these areas and associated safety risks arising from plant and people interactions, the asphalting works can only occur when there are minimal vehicle movements around site, particularly through the site entrance and on Paper Road. Cooler temperatures during evening and nighttime periods can also benefit the asphalt curing process.

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ii. any expected impacts in clear, plain English based on noise modelling;

- Scenario 1: The works has been noise modelled and is expected to be CLEARLY AUDIBLE (based on the CNVIS). We would compare this to the sound of a dishwasher in the next room. The maximum noise level for these works is 14 dB(A) above the noise management level (36 dB(A)).
- Scenario 2: The works has been noise modelled and is expected to be CLEARLY AUDIBLE (based on the CNVIS). We would compare this to the sound of a dishwasher in the next room. The maximum noise level for these works is 14 dB(A) above the noise management level (i.e., 36 dB(A)).
- Scenario 3: The works has been noise modelled and is expected to be NOTICEABLE to CLEARLY AUDIBLE (based on the CNVIS). We would compare this to the sound of a refrigerator in the same room. The maximum noise level for these works is 10 dB(A) above the noise management level (i.e., 36 dB(A)).
- Scenario 4: The works has been noise modelled and is expected to be NOTICEABLE to CLEARLY AUDIBLE (based on the CNVIS). We would compare this to the sound of a refrigerator in the same room. The maximum noise level for these works is 10 dB(A) above the noise management level (i.e., 36 dB(A)).

iii. the expected duration of the works;

- The works are planned to commence on the 09 July 2025 and will continue for the next 28 days. The community will be consulted at the end of each 28-day period and details of the subsequent consultation will be provided to the EPA.

iv. any expected benefits for receivers;

- Not applicable

v. any other known concurrent OOHW that will be occurring; and

- Scenario 1: No other known concurrent OOHW will be occurring.
- Scenario 2: No other known concurrent OOHW will be occurring.
- Scenario 3: No other known concurrent OOHW will be occurring.
- Scenario 4: No other known concurrent OOHW will be occurring.

vi. any other OOHW that will be occurring on the nights preceding and following the proposed works or, if the proposed work precedes or follows a weekend period, any other OOHW that will be occurring on the weekend.

- No other works are planned to occur OOHW at the time of community agreement

e) request consent from the Noise Sensitive Receiver for their responses to be provided to the EPA;

- Consent has been received by all residents identified for each scenario in the noise model and have been detailed in Appendix 2.

f*) ensure that a record is kept when a licensee is unable to contact a noise sensitive receiver after three attempts, including leaving "sorry I missed you" cards explaining the reason for the visit and requesting a return phone call; and*

- Not applicable, all impacted receivers have provided their consent for all three scenarios.
    - 146B CLIFTON AVENUE, KEMPS CREEK, NSW (14 db (A) above NML). Contacted on the 02 July 2025 at 1.31pm, 02 July 2025 at 1.47pm and 03 July 2025 at 8.22am. No response received. Refer to Appendix 2 for details.
    - 203-229 CLIFTON AVENUE, KEMPS CREEK, NSW (14 db (A) above NML). Contacted on the 03 July 2025. Provided consent on the same day. Refer to Appendix 2 for details.
    - 230-234 CLIFTON AVENUE, KEMPS CREEK, NSW (14 db (A) above NML). Contacted on the 02 July 2025. Provided consent on the same day. Refer to Appendix 2 for details.
    - 919-929 MAMRE ROAD, KEMPS CREEK, NSW (9 db (A) above NML). Address is not residential. Confirmation received on the address has been used intermittently as a training facility and usually during daytime hours. Refer to Appendix 2 for details.
    - 257 CLIFTON AVENUE, KEMPS CREEK, NSW (9 db (A) above NML). Contacted on the 03 July 2025. SMS reply from business associate that the family is overseas on holiday returning 24 July 2025. Refer to Appendix 2 for details.
    - 235-245 CLIFTON AVENUE, KEMPS CREEK, NSW (9 db (A) above NML). Contacted on the 03 July 2025. Provided consent on the same day. Refer to Appendix 2 for details.
    - 258 CLIFTON AVENUE, KEMPS CREEK, NSW (10 db (A) above NML). Contacted on the 03 July 2025. SMS reply from business associate that the family is overseas on holiday returning 24 July 2025. Refer to Appendix 2 for details.

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- 1669A ELIZABETH DRIVE, BADGERYS CREEK, NSW (7 db (A) above NML). Contacted on the 02 July 2025. Provided consent on the same day. Refer to Appendix 2 for details.

g) demonstrate, where the OOHW is predicted to go on longer than 28 calendar days, that the licensee has consulted the community in relation to re-engagement periods for the purpose of determining agreement from the community is maintained and continuing.

- The project will continue to consult and receive an agreement from the community every 28 days.

Condition E1.3

The licensee must report to the EPA the community consultation and agreement process that was undertaken with the Community Affected Catchments. This report to the EPA must be:

a) prepared in writing;

- This document

b) detail the steps taken to fulfil the requirements of condition E1.2;

- A noise model was completed to identify the impacts of the works to the nearest residents. The project contacted the residents and provided information and details on the works planned (refer to script in Appendix 2). Residents provided consent for the works to go ahead and the project will update the residents if there are any changes to the planned works.

c) demonstrate that the Noise Sensitive Receivers understood the nature of the works and any predicted impacts, including that consideration was made of additional requirements relevant to the needs of culturally and linguistically diverse Noise Sensitive Receivers;

- The project team has a pre-existing relationship with all of the sensitive receivers and there was no requirement for translating and interpreting services to support the conversation about the proposed works for 7 of the residents. The 8th receiver (230-234 Clifton Avenue) is culturally and linguistically diverse; the team uses text message to communicate as he can use Google Translate.

d) provide the script used during the community consultation with Noise Sensitive Receivers;

- Full script included in Appendix 2.

e) report community response and consent rates (including where no contact could be made) against the total community affected catchments, and must be broken down into response and consent rates based on sub-catchments that are delineated by affectation levels;

- Included in Appendix 2. All impacted residents provided full consent.

f) include a noise validation monitoring plan as required by E1.4; and

- Detailed below in Section E1.4.

g) be submitted to the EPA at least 15 business days prior to any works that are the subject of the agreement being undertaken unless prior arrangements have been made with the EPA

- Submitted on the 07 July 2025

A copy of the report must be:

a) *kept by the licensee for the duration of this licence including on the premises, and made available to an EPA authorised officer on request; and*

- Acknowledged, a copy of this report will be kept at the premises and for the duration of EPL 21800. A copy of this report will be made available to an EPA authorised officer on request,

b) *be made available on the licensee's project website or another website approved in writing by the EPA for the duration of the OOHWs permitted under condition E1.1. (Personal details of Noise Sensitive Receivers must be omitted).*

- Acknowledged, a copy of this report (as approved in writing by the EPA) will be made available on John Holland's website for the duration of the OOHW permitted under condition E1.1.

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Condition E1.4

Noise Validation Monitoring

A noise validation monitoring plan must be submitted to the EPA for approval as part of the community agreement documentation prior to any OOHW occurring.

- Noise validation monitoring will be done in accordance with the Noise and Vibration CEMP Sub-plan and the CNVIS.
- Noise validation monitoring of construction noise levels will be undertaken as follows:
    - Monitoring will be undertaken at the location which is used as part of noise prediction assessments and is consistent with the project's noise prediction tool, Gatewave or at a location that provides representative noise levels if there are access issues.
    - Monitoring will be carried out at the commencement of the activity. This will confirm that actual noise levels are consistent with noise impact predictions and that the management measures that have been implemented are appropriate;
    - Monitoring will be recorded over 15-minute sample intervals, excluding periods of extraneous noise until a representative sample has been obtained.
    - Monitoring will involve the minimum range of noise metrics, including the following A-weighted noise levels: LA90, LAeq, LA10, LA (min) and LA(max).
    - Noise measurements will be timed to ensure operation of the noisiest plant is captured.
    - Measurements will be recorded on a project-specific noise verification record form (Appendix A of the USC Noise & Vibration CEMP sub-plan)

Condition E1.5

Validation monitoring must be undertaken for any OOHW that are the approved under condition E1.1 and must:
a) be undertaken in accordance with the monitoring plan prepared under condition E1.4;

- Validation monitoring will be undertaken as stated in condition E1.4

b) be performed by a Competent Person;

- A member of the Upper South Creek Environment Team will be conducting the noise verification monitoring. All members of the team meet the definition of a *Competent Person* in the EPL 21800 Special Dictionary (E2.1).

c) be performed on at least the first 2 occasions (day, evening, nights) where OOHW will be undertaken and are likely to impact Noise Sensitive Receivers;

- Scenario 1: Noise monitoring will take place during the nighttime period (between 5am to 7am).
- Scenario 2: Noise monitoring will take place during the nighttime period (between 5am to 7am) and OOH period (1pm to 6pm).
- Scenario 3: Noise monitoring will take place during the evening and nighttime period (5am to 6am) and day OOH period (7am to 8am and between 1pm to 6pm).
- Scenario 4: Noise monitoring will take place during OOH period (6am – 6pm)

d) be performed on any other occasion (day, evening, night) where the nature of the works is likely to cause greater noise impacts than the first 2 occasions;

- Not applicable for the nature of the works.

e) be representative of the impacts in terms of monitoring locations, time and duration of measurements; and

- Monitoring will take place at multiple locations around the site boundary and it will be conducted in 15-minute intervals. It will be done during the noisiest plant for each scenario. The project also has SiteHive noise monitors across the site and will be able to capture real-time date throughout the works.
- Verification at the loudest resident is not accessible for 146B Clifton Avenue. Thus, as discussed with the project Acoustic Advisor, verification monitoring will take place at the project boundary and calculation will be done to identify the noise levels at the resident.

f) be recorded and provided to an EPA officer upon request.

- Monitoring data will be recorded and can be provided to the EPA upon request.

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Condition E1.6

If validation monitoring undertaken under Condition E1.5 shows that noise levels are higher than those predicted by any noise modelling undertaken as part of the community agreement, work practices must be modified immediately so that measured noise levels do not exceed predicted levels.
Where it has been determined that works cannot be modified to achieve the predicted noise levels:
a) the licensee must report immediately to the EPA; and

- Acknowledged, the project will report to the EPA if the noise levels are above predicted levels.

b) after considering the circumstances EPA may withdraw its permission under E1.1.

- Acknowledged, the project agrees with this condition.

Condition E1.7

Ongoing community engagement and agreement
a) For any approval of OOHW under E1.1 predicted to take longer than 28 calendar days to remain valid, the licensee must be able to demonstrate agreement from the community is maintained and continuing.

- The project will consult with the community every 28 days to ensure agreement is maintained and works can continue. This revision of the AWRC Extended Working Hours community agreement represents the information presented by John Holland to document ongoing community engagement and agreement required under condition E1.7 of EPL 21800 from 09 July for 28 days.

b) To demonstrate agreement from the community is maintained and continuing the licensee must:
i. engage the community to determine if a substantial majority of Noise Sensitive Receivers continue to consent to the OOHW pursuant to the re-engagement period determined under condition E1.2(d);

- The project will consult with the community every 28 days to ensure agreement is maintained and works can continue.

ii. provide the EPA with a report within 7 calendar days of the end of each re-engagement period summarising the community response including ongoing consent rates of the Noise Sensitive Receiver; and

- The project will provide the EPA with a report following re-engagement with the community and will include ongoing consent rates.

c) Where the licensee is unable to demonstrate a substantial majority of agreement from Community Affected Catchment is maintained and continuing:
i. the licensee must report immediately to the EPA; and

- The project will report to the EPA if applicable.

ii. after considering the circumstances EPA may withdraw its permission under E1.1.

- Noted and acknowledged.

Conclusion

John Holland seeks the EPA's approval to continue to undertake Out of Hours Work in accordance with the information provided in this community agreement report starting on the 09 July 2025 for a further 28 days.

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Appendix 1 – OOHW Permit (Draft)

*General Construction denotes the following – *structure construction* and *electrical and mechanical installation* in accordance with the activities specified in the CNVIS.

A. General Details			
Contract:	Upper South Creek (USC) Project		
Contractor:	John Holland Pty. Ltd.		
Application Title:	AWRC Extended Hours Community Agreement		
Application Number:	A00XX		
Application Date:	XX/07/2025		
Relevant Planning Approval:	SSI 8609189		
Environmental Protection Licence (EPL):	21800		
Contact Details			
Position	**Name**	**Contact Number**	**Email**
Construction Manager	Jeremy Cadzow	0409 654 791	Jeremy.Cadzow@jhg.com.au
Communications Representative	Sheila Maidment	0459 885 912	Sheila.Maidment@jhg.com.au
Environmental Manager / Representative	Alyce Harrington	0409 633 908	Alyce.Harrington@jhg.com.au

B. Details of Proposed Scope of Works	
Proposed Works: • **Work methodologies.** • **List of plant / equipment to be used (worst case scenario).**	The works are planned to take place within the AWRC site (NCA T1). The project plans to conduct concrete pours and general construction in accordance with the timing below: • Concrete Pour (5am – 7am; Monday to Friday) • General Construction (6am – 7am Monday to Friday and 1pm – 6pm Saturday) The plant and equipment which will be us is detailed in the noise assessment. Commencement of these works is subject to approval by NSW EPA.
Justification for OOHW	Community Agreement in accordance with EPL Condition E1
Proposed Timings	Works outside standard construction hours will be undertaken during the following Out of Hours (OOH) periods: • OOH Period 1 (6 pm- 10pm) • OOH Period 2 (10 pm – 7am)
Worst-case number of consecutive occasions affecting the same receiver:	9
Acoustic Assessment attached? ☒ Yes (Refer to Appendix 3) ☐ No	

C. Assessed Noise and Vibration Impacts and Applicable Mitigation Measures		
Refer to Appendix 3 for quantitative Noise and Vibration Impact Assessment for the works.		
Mitigation Measures		
Noise / Vibration Mitigation Measure	**Reasonable / Feasible (Y/N/NA)**	**Comments**
Have you considered programming of noisy activities to reduce community impacts?	N/A	Where possible, noisy works such as saw cutting will be prioritised to be completed during the day period.
Are there alternative plant or methods that can be used to reduce noise?	N/A	No alternative plant or methods are proposed. The nature of open trenching works allows the workfront to progress and ensure nearby receivers are not exposed to noise for multiple nights.
Noise barriers/mats to assist noise management for all noisy works where practical	N/A	Noise barriers will be in place during activities such as saw cutting and rock breaking.
Where possible, trucks and vehicles to be parked up between noisy works when operating near sensitive receivers.	Y	This will be implemented where reasonable and feasible.
All plant and equipment to minimise reversing where possible and must include the use of non-tonal reversing beepers (or an equivalent mechanism, e.g. 'quackers')	Yes	All mobile plant and equipment on site will have non-tonal reversing alarms equipped.
Staff to be briefed before works - no loud talking, excessive use of radios, music, swearing, be mindful of the community. Turn off equipment when not in use. Do not drop tools, equipment, and materials	Yes	Included in inductions and pre-starts.
Supervisors will make note of, and have removed off site and replaced any equipment item observed to have defective noise controls e.g. defective muffler, loose or missing cowling or engine compartment panels etc	Yes	Defective plant and equipment will be identified during plant inductions and during site inspections. Any defective plant/equipment will be removed and/or replaced.
During high noise impact works 3 hours on 1 hour off must be enforced unless the high noise activity is to be completed before midnight.	Yes	High noise impact work will be prioritised to be completed during the day period wherever possible. Where high noise impact works are carried out after 12am these will continue with 3 hours on and 1 hour off.
Can temporary relocation (eg. accommodation) be offered to the adjacent sensitive receivers?	N/A	Alternative accommodation is not proposed as part of this community agreement.
Is minimum distance for cosmetic damage or human comfort triggered	N/A	No vibratory works will be carried out within the minimum working distance.
Are there any additional measures that could be incorporated to further mitigate any noise impacts?	Y	• All workers are to have completed the project induction and attended the pre-start toolbox. • Pre-start toolbox is to include the requirement for workers to leave the site in a quiet and considerate manner after the completion of works, being mindful of the site's neighbours. • Workers to communicate through walkie talkies when communicating over large distances (no shouting). • Flood lights will be directed down to prevent light spill. • Reversing alarms to be non-tonal only. • Plant not in use to be switched off. • Residential grade mufflers will be fitted. • Air brake silencers will be installed and operational. • No signalling by horns. • No whistles to be used. • No shouting.

		• No radios. • No dropping of materials from height, throwing of metal items and slamming of doors. • No excessive revving of plant and vehicle engines.
Additional Mitigation Measures	**Reasonable/Feasible (Y/N/NA)**	**Comments**
Notification (N)	Y	• A Gatewave noise model has been developed which models the activity occurring in the work area. The model identified residents to be impacted. The residents were consulted and notified prior to works taking place. • Consent from the residences are noted in this community agreement.
Specific Notification (SN)	Y	• A specific community consultation script regarding the works was delivered to each of the identified receivers as part of the community agreement process.
Individual Briefing (IB)	Y	• A specific community consultation script regarding the works was delivered to each of the identified receivers as part of the community agreement process.
Alternative Accommodation (AA)	N	• Alternative accommodation has not been considered as part of the community agreement.
Verification of predicted noise (V)	Y	• Attended verification noise monitoring will be carried out at the nearest residential receiver during the start of the works (the closest available location).
Phone Call (PC)	Y	• A specific community consultation script regarding the works was delivered to each of the identified receivers as part of the community agreement process.
Project Specific Respite Offer (RO)	N	• Works will continue for 5 consecutive nights in accordance with the community agreement. Respite will be provided on saturdays and Sundays until completion of the works. High noise activities will be completed during the day period wherever possible.
Duration Respite (DR)	N	• The works proposed to be completed in accordance with the community agreement will allow the scope of work on Park Road to be completed within a shorter timeframe.

D. Approval Status

☒ OOHW Approved / Endorsed
☐ OOHW Approved with conditions (see below)
☐ OOHW Rejected

Conditions for Approval:

Assessment of Risk Factors: ☒ Low ☐ Medium ☐High			
Position	**Name**	**Signature**	**Date**
Environmental Manager	**Alyce Harrington**		XX/07/2025
Community Manager	**Sheila Maidment**		XX/07/2025
Construction Manager	**Jeremy Cadzow**		XX/07/2025

Appendix 2 – Community Consultation Record

*General Construction denotes the following – *structure construction* and *electrical and mechanical installation* in accordance with the activities specified in the CNVIS.

2 July 2025

Upper South Creek Advanced Water Recycling Centre – extended working hours AWRC

Civil activities have reduced over the past three months and mechanical and electrical activities are ramping up. By mid-year commissioning of the facility will start. In anticipation of the team starting to build the permanent roads and footpaths and to fast-track mechanical and electrical fit-out ahead of commissioning, we are proposing a change to the community agreement.

We are proposing to complete works outside standard hours that would interfere with general construction if completed during the day, such as road works. We are also proposing mechanical and electrical works during night time that could be completed inside structures, which would generate less of a noise impact for residents.

The hours proposed are as detailed in the table below. Scenario 1 and 2 are unchanged from the previous community agreement. Scenario 3 and 4 are new proposals. The asphalt works mentioned in scenario 3 and 4 would occur occasionally, while the mechanical and electrical works inside structures would be continuous. The noise characteristic is clearly audible as it accounts for the noise generating by asphalting works.

Scenario 1	Monday to Friday	5am – 7am	General Construction*
Scenario 2	Saturday	5am - 8am and 1pm – 6pm	General Construction*
Scenario 3	Monday to Friday	6pm – 5am	Asphalt Works and/or Mechanical and Electrical Fit Out
Scenario 4	Sunday	6am – 6pm	Asphalt Works and/or Mechanical and Electrical Fit Out

Sydney Water Corporation ABN 49 776 225 038
1 Smith Street, Parramatta, NSW 2150 | PO Box 399, Parramatta, NSW 2124
Telephone 13 20 92 **Media (24/7)** 8849 5151 **sydneywater.com.au**

Benefits

Reduce traffic on Clifton Avenue and Elizabeth Drive by spacing out deliveries and arrival of team to site.

Choosing works that have a significant impact on overall program while minimising impact on residents.

Consultation record

Impacted Resident	Impacted resident location	Consultation detail	Noise level at impacted resident location
1	146B CLIFTON AVENUE, KEMPS CREEK, NSW (19 db (A) above NML)	Justin and Nicole Railton Phone call 2/07 1.31pm SMS 2/07 1.47pm SMS 3/07 8.22am No response received following text messages sent to impacted resident.	Clearly Audible
2	203-229 CLIFTON AVENUE, KEMPS CREEK, NSW (19 db (A) above NML)	Jim and Mary Vella 0419 252 746 (Jim) 3/07 12.41pm phone call “We haven’t heard anything, we’re all good.”	Clearly Audible
3	1669A ELIZABETH DRIVE, BADGERYS CREEK, NSW (14 db (A) above NML)	Rob Blacker 0428 483 856 (Rob) Called 2/07 1.49pm “I haven’t noticed the night work.”	Clearly Audible
4 and 5	257 CLIFTON AVENUE, KEMPS CREEK, NSW (15 db (A) above NML) And	Kim Ngov and Mangden Ros 0412 172 404 (Kim) SMS 3/07 7.49am	Clearly Audible

	258 CLIFTON AVENUE, KEMPS CREEK, NSW (15 db (A) above NML)	SMS reply 3/07 7.49am from business associate that the family is overseas on holiday returning 24/7.	
6	235-245 CLIFTON AVENUE, KEMPS CREEK, NSW (15 db (A) above NML)	Vivian and James 60419 935 444 (James) 3/07 12.45pm phone call “No I haven’t heard any of the work, we’re fine.”	Clearly Audible
7	230-234 CLIFTON AVENUE, KEMPS CREEK, NSW	Charlie and Lily Bugeja 0400 207 180 (Lily) 3/07 2.36pm phone call “We haven’t heard a thing. We’ve noticed the lights of the site from a distance but haven’t been able to hear the work.”	Clearly Audible
8	230-234 CLIFTON AVENUE, KEMPS CREEK, NSW	Dan (tenant) CALD – texted so they can use Google Translate. SMS 2/7 1.48pm SMS reply 2/7 2.57pm “Thank you for your greeting! Your night shift has no effect on us.”	Clearly Audible

Appendix 3 – Gatewave Noise Model

General Construction

*General Construction denotes the following – *structure construction* and *electrical and mechanical installation* in accordance with the activities specified in the CNVIS.

From: Renzo Tonin and Associates via Gatewave
Calculation scenario: **Extended Construction Hours AWRC - Concrete Pour 5am** (Gatewave ID TM588_150)

Upper South Creek – Noise and Vibration Assessment Report

1 Introduction

The Renzo Tonin and Associates web-based construction assessment tool (Gatewave) has been used to prepare this noise and vibration assessment report for John Holland and the Upper South Creek Advanced Water Recycling Centre project (the Project).

The overall noise and vibration impacts from the Project works and associated mitigation measures (e.g. hoardings) have already been addressed in previous Construction Noise and Vibration Impact Statements (CNVIS) in accordance with CoA E48. This tool allows specific work areas and activities to be assessed as construction works progress. It also allows cumulative noise impact from other aspects of the Project or, where relevant noise from other construction projects, to be assessed and managed in accordance with the Construction Noise and Vibration Management Plan (USCP-JHG-MPL-ENV-0007, the 'CNVMP').

2 Assessment methodology

2.1 Construction noise

Results for the assessment of airborne noise were determined using a CadnaA computer noise model developed for the Project. The CadnaA noise model incorporates ground elevation contours, building heights, the built environment and atmospheric conditions to predict construction noise in accordance with the International Standard ISO 9613-2:1996 implementing quality standard ISO 17534-1:2015.

Results from the CadnaA noise model are exported and stored into the Gatewave database which allows for the prediction of the total cumulative noise from all construction activities.

A summary of the noise calculation parameters is detailed in Table 1.

Table 1: Summary of noise modelling parameters

Parameters	Inputs
Calculation method	ISO 9613-2:1996 implementing quality standard ISO 17534-1:2015
Location of noise sources above the local ground	1.5m
Height of receivers	1.5m above ground level to represent 1.5m above ground floor level Additional 3m height for every additional floor assessed (i.e. 4.5m above ground for first floor, 7.5m for second floor etc.)
Sound Power Levels (L_w) of plant and equipment	All Lw data obtained from Renzo Tonin & Associates database Detailed in Section 3
Construction activities	Detailed in Section 3
Ground absorption	Varying from 1 for absorptive surfaces (e.g. park land), 0.5 (e.g. residential areas) to 0 for reflective surfaces (e.g. water, concrete, paving);
Noise barriers and screening	As detailed in Project CNVIS

2.2 Construction vibration

The plant and equipment considered in this scenario are not considered vibration intensive. As a result, minimum working distances (MWDs) for cosmetic damage or human annoyance have not been nominated.

3 Construction activities, work areas and NCAs

3.1 Justification to complete the works OOH

EPL Section 8 Special Condition. E1 Community Agreement

3.2 Construction activities

3.2.1 Plant and equipment use

A summary of the plant and equipment operating during each assessment time period is presented in Table 2. Note that Table 2 identifies if a plant/equipment item is used for part or all of the assessment period on a given day, and does not necessarily denote if the plant/equipment are operating concurrently (refer APPENDIX A for details on which plant/equipment are operating together).

Table 2: Proposed construction activities and associated sound power levels

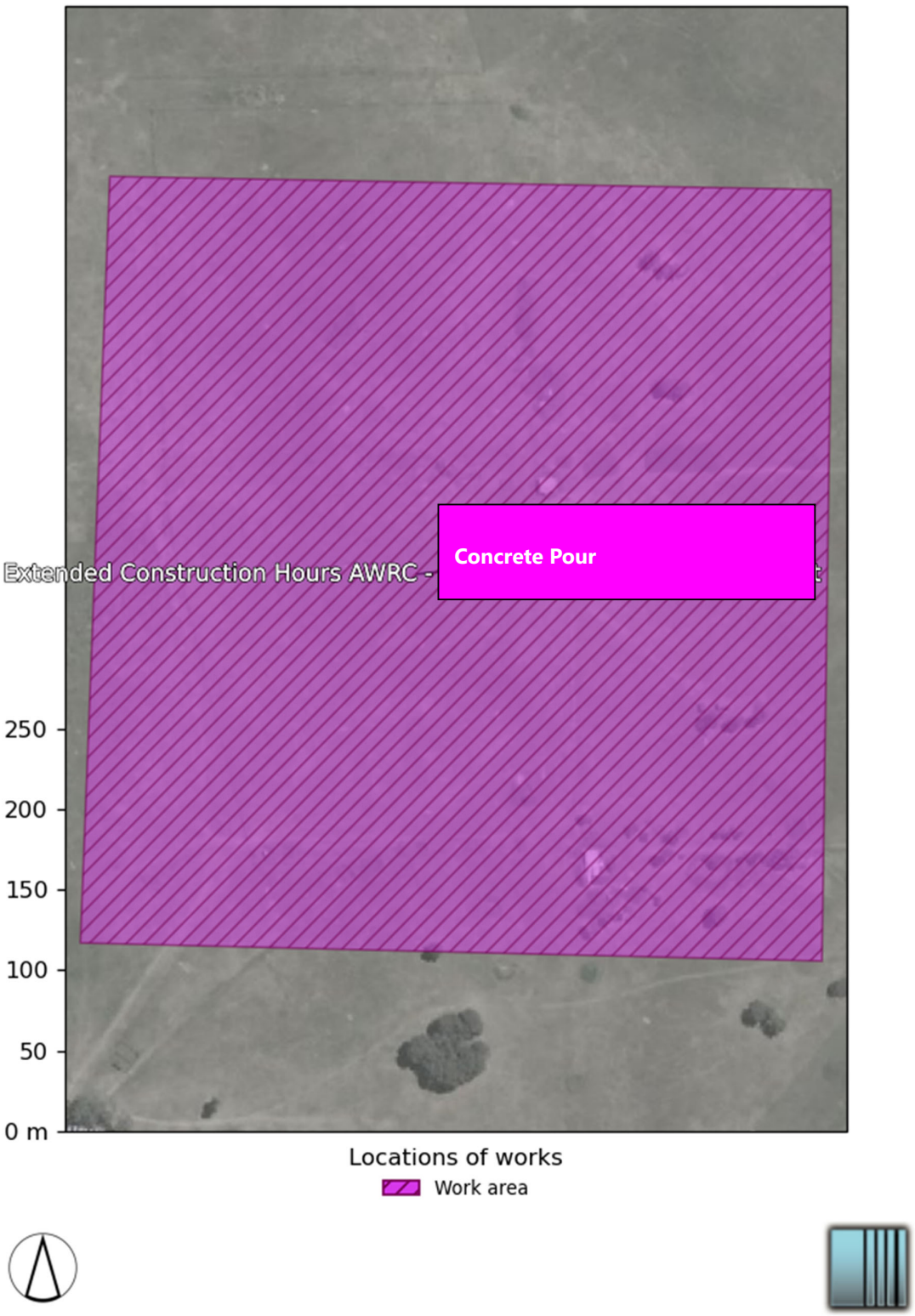
Activity/plant/equipment	Number in use				Sound power level, dB(A)		High impact item	Noise reduction from mitigation measures, dB(A)
	Day	Day (OOH)	Evening	Night	Leq	Lmax		
Extended Construction Hours AWRC -Concrete Pour 5am start								
Concrete Agi	-	1	-	1	108	111	-	-
Concrete pump	-	1	-	1	103	107	-	-
Concrete vibrator	-	2	-	2	100	100	-	-
Light vehicles	-	-	-	2	82	100	-	-

Notes:

1) Refer APPENDIX A for plant/equipment timings and to identify which items operate concurrently.
2) Equipment marked in **orange** are not verified by Renzo Tonin and Associates

The locations of the construction activities are presented in Figure 1.

Figure 1: Construction work areas



4 Construction noise and vibration impacts

4.1 Predicted noise levels

4.1.1 Construction $L_{Aeq,15min}$ assessment

Noise levels were determined by modelling the noise sources, receiver locations, and operating activities, based on the information presented in Table 2.

The noise predictions presented in this report represent a realistic worst-case scenario when construction occurs at the closest location within a specific work area. At each receiver, noise levels will vary during the construction period based on the position of equipment within the work area, the distance to the receiver, the construction activities being undertaken and the noise levels of particular plant items and equipment. Actual noise levels will often be less than the predicted levels presented.

A summary of the results is presented in Table 3. NMLs and predictions for the three worst-affected receivers for each works area are provided in Table 4. Detailed noise results including additional mitigation measures are provided in APPENDIX B and presented visually in noise maps in APPENDIX C.

Table 3: Summary of receivers above relevant NMLs

NCA	Day		Day (OOH)		Evening		Night	
	dB(A) above NML	No. of properties	dB(A) above NML	No. of properties	dB(A) above NML	No. of properties	dB(A) above NML	No. of properties
NCA T1	0 to 10		0 to 5	0	0 to 5		0 to 5	3
	> 10		6 to 15	0	6 to 15		6 to 15	0
	Over 75 dB(A)		16 to 25	0	16 to 25		16 to 25	0
			> 25	0	> 25		> 25	0
Industrial	0 to 10		0 to 5	0	0 to 5		0 to 5	0
	> 10		6 to 15	0	6 to 15		6 to 15	0
	Over 75 dB(A)		16 to 25	0	16 to 25		16 to 25	0
			> 25	0	> 25		> 25	0

4.2 Predicted vibration levels

The plant and equipment described in Table 2 are not considered vibration intensive and, as a result, do not have MWDs for cosmetic damage or human annoyance.

4.3 Mitigation measures

4.3.1 Specific reasonable and feasible mitigation measures

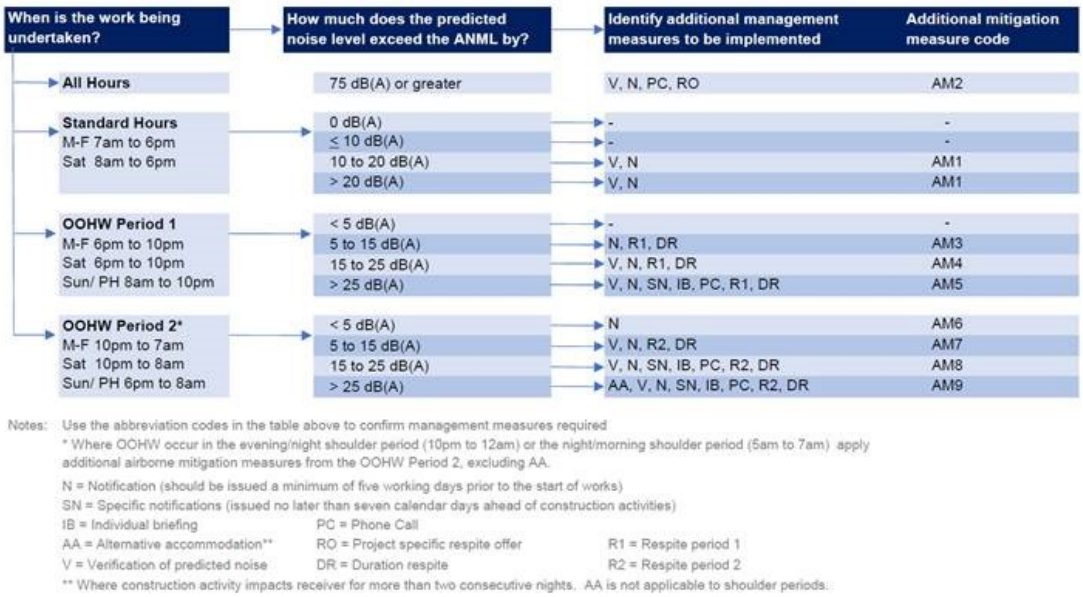
- Site inductions will be carried out for all personnel to include potential impacts to sensitive receivers and worker behaviours. At the start of each shift a briefing regarding noise will be included as part of the pre-start to inform all personnel of the noise sensitivities of the area and works.
- Verification monitoring to be carried out at the start of out of hours works for each location to confirm predicted noise levels.
- Noise source observations to be carried out by the Environment Team at the start of the works with any additional mitigation measures or observations to be implemented.
- All equipment to be fitted with non-tonal reversing alarms.
- No swearing or unnecessary shouting or loud stereos/radios/phone calls on speaker on-site.
- No dropping of materials from height, throwing of metal items and slamming of doors
- Light vehicles and plants to be switched off when not in use.

4.3.2 Additional noise mitigation measures

In accordance with the CNVG, where, after application of all reasonable and feasible mitigation measures, the $L_{Aeq(15minute)}$ airborne construction noise levels are still predicted to exceed the NMLs, additional airborne noise mitigation measures can be applied to further limit the risk of annoyance from construction noise.

Figure 2 presents a summary of the additional noise mitigation measures applicable for construction activities where, after application of all reasonable and feasible mitigation options, construction noise levels still exceed the NMLs.

Figure 2: Additional airborne noise mitigation measures



When is the work being undertaken?	How much does the predicted noise level exceed the ANML by?	Identify additional management measures to be implemented	Additional mitigation measure code
All Hours	75 dB(A) or greater	V, N, PC, RO	AM2
Standard Hours M-F 7am to 6pm Sat 8am to 6pm	0 dB(A)	-	-
	≤ 10 dB(A)	-	-
	10 to 20 dB(A)	V, N	AM1
	> 20 dB(A)	V, N	AM1
OOHW Period 1 M-F 6pm to 10pm Sat 6pm to 10pm Sun/ PH 8am to 10pm	< 5 dB(A)	-	-
	5 to 15 dB(A)	N, R1, DR	AM3
	15 to 25 dB(A)	V, N, R1, DR	AM4
	> 25 dB(A)	V, N, SN, IB, PC, R1, DR	AM5
OOHW Period 2* M-F 10pm to 7am Sat 10pm to 8am Sun/ PH 6pm to 8am	< 5 dB(A)	N	AM6
	5 to 15 dB(A)	V, N, R2, DR	AM7
	15 to 25 dB(A)	V, N, SN, IB, PC, R2, DR	AM8
	> 25 dB(A)	AA, V, N, SN, IB, PC, R2, DR	AM9

Notes: Use the abbreviation codes in the table above to confirm management measures required
* Where OOHW occur in the evening/night shoulder period (10pm to 12am) or the night/morning shoulder period (5am to 7am) apply additional airborne mitigation measures from the OOHW Period 2, excluding AA.
N = Notification (should be issued a minimum of five working days prior to the start of works)
SN = Specific notifications (issued no later than seven calendar days ahead of construction activities)
IB = Individual briefing PC = Phone Call
AA = Alternative accommodation** RO = Project specific respite offer R1 = Respite period 1
V = Verification of predicted noise DR = Duration respite R2 = Respite period 2
** Where construction activity impacts receiver for more than two consecutive nights. AA is not applicable to shoulder periods.

4.3.3 Noise monitoring plan

Attended noise monitoring is to be undertaken to verify that noise levels resulting from works are in accordance with the levels predicted in this noise and vibration assessment report, subject to obtaining the property owner/occupier's consent to access the property (where required). Noise monitoring should be carried out on or near the property boundary at a location representative of the worst affected location (i.e. in publicly accessible areas on or near the nominated receivers, typically at ground level).

Table 4 identifies potential monitoring locations in each NCA, which are the three worst noise-affected receivers for each NCA from the works.

Note: Gatewave tries to find the most affected receivers in each NCA (up to 3 locations) purely based on the numerical results. These locations will be reviewed for suitability based on safety, accessibility, will provide valid data, etc. If not suitable, alternative suitable locations will be selected for verification monitoring.

If monitoring levels exceed predicted levels, continual improvement and corrective action measures will be implemented, (e.g. investigate cause, review work or activity, scheduling, etc).

Table 4: Nominated verification monitoring locations

Receiver			Noise management levels (NMLs), dB(A)				Sleep disturbance goals, dB(A)		Predicted noise levels, dB(A) Leq,15min				Predicted noise levels, dB(A) Lmax
NCA	Address	Land use	NML Day	NML Day (OOH)	NML Evening	NML Night	Lmax (screening)	Lmax (limit)	Day	Day (OOH)	Evening	Night	Night
NCA T1	230-234 CLIFTON AVENUE, KEMPS CREEK, NSW	Residential	45	40	40	36	55	65	-	39	-	39	42
NCA T1	203-229 CLIFTON AVENUE, KEMPS CREEK, NSW	Residential	45	40	40	36	55	65	-	38	-	38	41
NCA T1	146B CLIFTON AVENUE, KEMPS CREEK, NSW	Residential	45	40	40	36	55	65	-	38	-	38	41

4.3.4 Vibration monitoring

As the plant and equipment in this scenario are not considered to be vibration intensive, further vibration monitoring is not required.

If attended vibration monitoring is required (for example, in response to vibration-related complaints), monitoring will be undertaken according to the process described in the CNVMP.

Vibration monitoring should follow the procedures outlined in Appendix F of the CNVG.

Important disclaimer

* This document has been partly automatically generated by Gatewave ™, software for prediction, assessment and management of noise and vibration, developed by Renzo Tonin and Associates.

* This document is uncontrolled. Please contact Renzo Tonin and Associates if you suspect there are any errors in this report.

* Results in this report are based on the assumptions described in Section 0 and inputs presented in Section 3. Noise and vibration monitoring data will be collected to ensure Gatewave is verified and adjusted, if required.

* Renzo Tonin and Associates cannot be held liable for the misuse of the software Gatewave ™, including any errors that may be contained within the software.

APPENDIX A Summary of works

A.1 Plant and equipment

Table 5: Plant and equipment schedule for work area: **Extended Construction Hours AWRC – Concrete Pour 5am start**

Equipment	Penalty, dB(A)	Quantity	Intensity	Reduction, dB	Sound power level, dB(A)		Start time	End time
					$L_{eq,15min}$	L_{max}		
Extended Construction Hours AWRC – Concrete Pour 5am start								
Concrete Agi	-	1	100%	0	108	111	Monday to Friday 05:00:00	Monday to Friday 07:00:00
Concrete pump	-	1	100%	0	103	107	Monday to Friday 05:00:00	Monday to Friday 07:00:00
Concrete vibrator	-	2	100%	0	100	100	Monday to Friday 05:00:00	Monday to Friday 07:00:00
Light vehicles	-	2	10%	0	82	100	Monday to Friday 05:00:00	Monday to Friday 07:00:00

APPENDIX B Detailed construction noise results

Table 6: Construction noise results

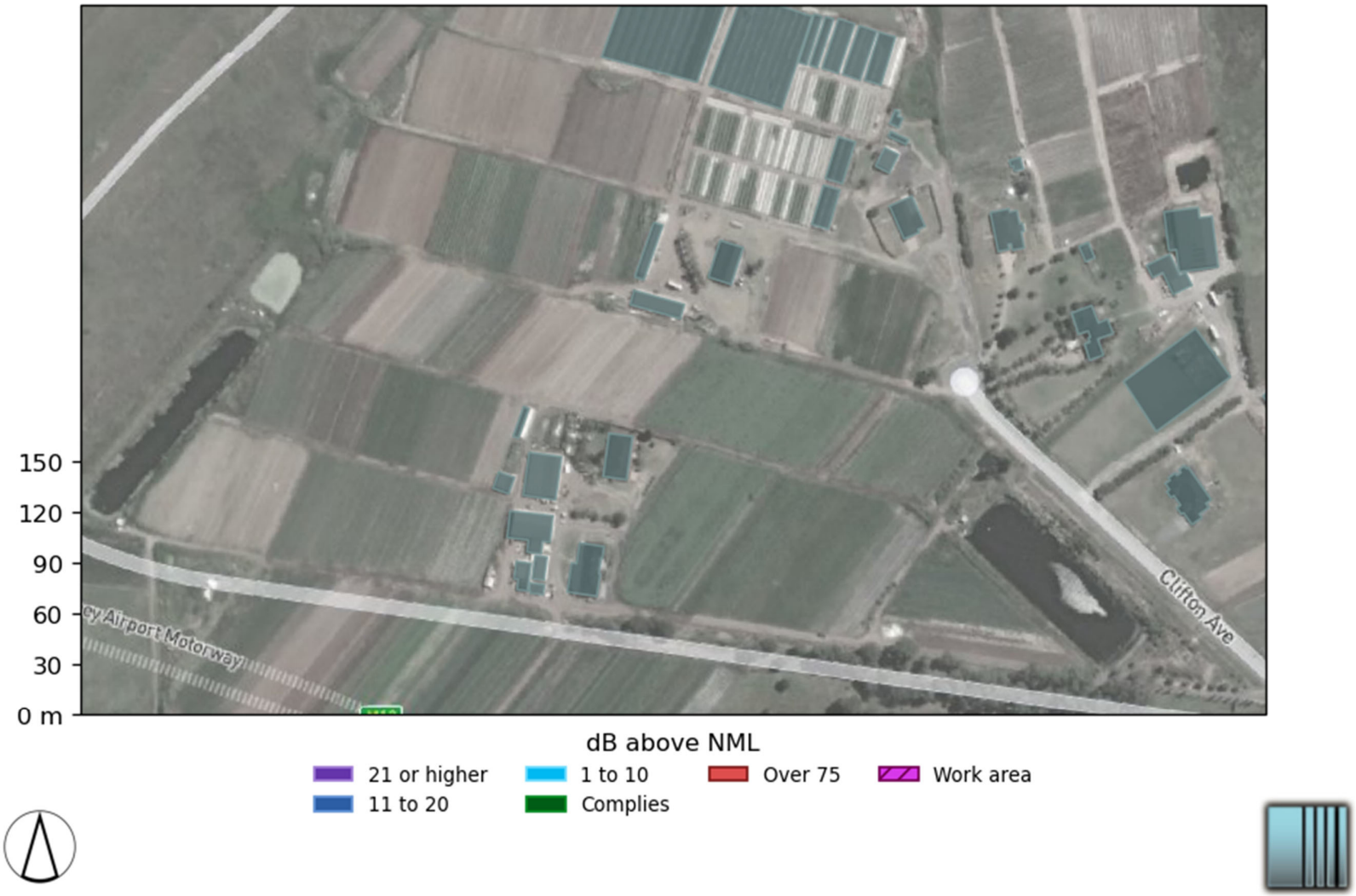
Receiver		Noise management levels (NMLs), dB(A)				Sleep disturbance goals, dB(A)		Predicted noise levels, dB(A) Leq,15min				Predicted noise levels, dB(A) Lmax	Additional mitigation			
Address	Land use	NML Day	NML Day (OOH)	NML Evening	NML Night	Lmax (screening)	Lmax (limit)	Day	Day (OOH)	Evening	Night	Night	Day	Day (OOH)	Evening	Night
885A MAMRE ROAD, KEMPS CREEK, NSW	Non-receiver	999	999	999	999	None	None	-	98	-	98	101	-	-	-	-
885A MAMRE ROAD, KEMPS CREEK, NSW	Non-receiver	999	999	999	999	None	None	-	95	-	95	98	-	-	-	-
885A MAMRE ROAD, KEMPS CREEK, NSW	Non-receiver	999	999	999	999	None	None	-	94	-	94	97	-	-	-	-
885A MAMRE ROAD, KEMPS CREEK, NSW	Non-receiver	999	999	999	999	None	None	-	94	-	94	97	-	-	-	-
917 MAMRE ROAD, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	42	-	42	46	-	-	-	-
203-229 CLIFTON AVENUE, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	41	-	41	44	-	-	-	-
917 MAMRE ROAD, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	41	-	41	44	-	-	-	-
230-234 CLIFTON AVENUE, KEMPS CREEK, NSW	Non-receiver	999	999	999	999	None	None	-	40	-	40	42	-	-	-	-
203-229 CLIFTON AVENUE, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	39	-	39	42	-	-	-	-
230-234 CLIFTON AVENUE, KEMPS CREEK, NSW	Non-receiver	999	999	999	999	None	None	-	39	-	39	42	-	-	-	-
949A MAMRE ROAD, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	39	-	39	42	-	-	-	-
230-234 CLIFTON AVENUE, KEMPS CREEK, NSW	Residential	45	40	40	36	55	65	-	39	-	39	42	-	-	-	AM1
917 MAMRE ROAD, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	38	-	38	42	-	-	-	-
203-229 CLIFTON AVENUE, KEMPS CREEK, NSW	Non-receiver	999	999	999	999	None	None	-	38	-	38	41	-	-	-	-
146B CLIFTON AVENUE, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	38	-	38	41	-	-	-	-
203-229 CLIFTON AVENUE, KEMPS CREEK, NSW	Residential	45	40	40	36	55	65	-	38	-	38	41	-	-	-	AM1
146B CLIFTON AVENUE, KEMPS CREEK, NSW	Residential	45	40	40	36	55	65	-	38	-	38	41	-	-	-	AM1
230-234 CLIFTON AVENUE, KEMPS CREEK, NSW	Non-receiver	999	999	999	999	None	None	-	38	-	38	41	-	-	-	-
901 MAMRE ROAD, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	38	-	38	41	-	-	-	-
146B CLIFTON AVENUE, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	38	-	38	41	-	-	-	-
146B CLIFTON AVENUE, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	38	-	38	41	-	-	-	-
203-229 CLIFTON AVENUE, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	38	-	38	41	-	-	-	-
203-229 CLIFTON AVENUE, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	38	-	38	41	-	-	-	-
203-229 CLIFTON AVENUE, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	38	-	38	40	-	-	-	-
230-234 CLIFTON AVENUE, KEMPS CREEK, NSW	Non-receiver	999	999	999	999	None	None	-	37	-	37	40	-	-	-	-
901 MAMRE ROAD, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	37	-	37	40	-	-	-	-
230-234 CLIFTON AVENUE, KEMPS CREEK, NSW	Non-receiver	999	999	999	999	None	None	-	37	-	37	40	-	-	-	-
901 MAMRE ROAD, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	37	-	37	40	-	-	-	-
917 MAMRE ROAD, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	36	-	36	40	-	-	-	-
917 MAMRE ROAD, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	36	-	36	39	-	-	-	-
203-229 CLIFTON AVENUE, KEMPS CREEK, NSW	Non-receiver	999	999	999	999	None	None	-	36	-	36	39	-	-	-	-
919-929 MAMRE ROAD, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	36	-	36	39	-	-	-	-
917 MAMRE ROAD, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	35	-	35	38	-	-	-	-
919-929 MAMRE ROAD, KEMPS CREEK, NSW	Residential	45	40	40	36	55	65	-	35	-	35	38	-	-	-	-
230-234 CLIFTON AVENUE, KEMPS CREEK, NSW	Non-receiver	999	999	999	999	None	None	-	35	-	35	38	-	-	-	-
146B CLIFTON AVENUE, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	35	-	35	38	-	-	-	-
230-234 CLIFTON AVENUE, KEMPS CREEK, NSW	Non-receiver	999	999	999	999	None	None	-	35	-	35	38	-	-	-	-
230-234 CLIFTON AVENUE, KEMPS CREEK, NSW	Non-receiver	999	999	999	999	None	None	-	35	-	35	38	-	-	-	-

Receiver		Noise management levels (NMLs), dB(A)				Sleep disturbance goals, dB(A)		Predicted noise levels, dB(A) Leq,15min				Predicted noise levels, dB(A) Lmax	Additional mitigation			
Address	Land use	NML Day	NML Day (OOH)	NML Evening	NML Night	Lmax (screening)	Lmax (limit)	Day	Day (OOH)	Evening	Night	Night	Day	Day (OOH)	Evening	Night
230-234 CLIFTON AVENUE, KEMPS CREEK, NSW	Non-receiver	999	999	999	999	None	None	-	35	-	35	38	-	-	-	-
237-247 CLIFTON AVENUE, KEMPS CREEK, NSW	Residential	45	40	40	36	55	65	-	35	-	35	38	-	-	-	-
230-234 CLIFTON AVENUE, KEMPS CREEK, NSW	Non-receiver	999	999	999	999	None	None	-	34	-	34	38	-	-	-	-
235-245 CLIFTON AVENUE, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	34	-	34	37	-	-	-	-
901 MAMRE ROAD, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	34	-	34	37	-	-	-	-
146B CLIFTON AVENUE, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	34	-	34	37	-	-	-	-
235-245 CLIFTON AVENUE, KEMPS CREEK, NSW	Residential	45	40	40	36	55	65	-	34	-	34	37	-	-	-	-
917 MAMRE ROAD, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	34	-	34	37	-	-	-	-
949-965 MAMRE ROAD, KEMPS CREEK, NSW	Residential	45	40	40	36	55	65	-	34	-	34	37	-	-	-	-
901 MAMRE ROAD, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	34	-	34	37	-	-	-	-
230-234 CLIFTON AVENUE, KEMPS CREEK, NSW	Residential	45	40	40	36	55	65	-	34	-	34	37	-	-	-	-
230-234 CLIFTON AVENUE, KEMPS CREEK, NSW	Non-receiver	999	999	999	999	None	None	-	34	-	34	37	-	-	-	-
258 CLIFTON AVENUE, KEMPS CREEK, NSW	Residential	45	40	40	36	55	65	-	34	-	34	37	-	-	-	-
146B CLIFTON AVENUE, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	34	-	34	37	-	-	-	-
230-234 CLIFTON AVENUE, KEMPS CREEK, NSW	Non-receiver	999	999	999	999	None	None	-	34	-	34	37	-	-	-	-
235-245 CLIFTON AVENUE, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	34	-	34	37	-	-	-	-
146B CLIFTON AVENUE, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	34	-	34	37	-	-	-	-
885-899 MAMRE ROAD, KEMPS CREEK, NSW	Non-receiver	999	999	999	999	None	None	-	34	-	34	36	-	-	-	-
885-899 MAMRE ROAD, KEMPS CREEK, NSW	Non-receiver	999	999	999	999	None	None	-	34	-	34	36	-	-	-	-
1669A ELIZABETH DRIVE, BADGERYS CREEK, NSW	Non-receiver	999	999	999	999	None	None	-	33	-	33	36	-	-	-	-
917 MAMRE ROAD, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	33	-	33	36	-	-	-	-
901 MAMRE ROAD, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	33	-	33	36	-	-	-	-
146B CLIFTON AVENUE, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	33	-	33	36	-	-	-	-
885-899 MAMRE ROAD, KEMPS CREEK, NSW	Non-receiver	999	999	999	999	None	None	-	33	-	33	36	-	-	-	-
931A MAMRE ROAD, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	33	-	33	36	-	-	-	-
931A MAMRE ROAD, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	33	-	33	36	-	-	-	-
1669A ELIZABETH DRIVE, BADGERYS CREEK, NSW	Residential	45	40	40	36	55	65	-	33	-	33	36	-	-	-	-
901 MAMRE ROAD, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	33	-	33	36	-	-	-	-
230-234 CLIFTON AVENUE, KEMPS CREEK, NSW	Non-receiver	999	999	999	999	None	None	-	32	-	32	35	-	-	-	-
230-234 CLIFTON AVENUE, KEMPS CREEK, NSW	Non-receiver	999	999	999	999	None	None	-	32	-	32	35	-	-	-	-
949-965 MAMRE ROAD, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	32	-	32	35	-	-	-	-
203-229 CLIFTON AVENUE, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	32	-	32	35	-	-	-	-
901 MAMRE ROAD, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	32	-	32	35	-	-	-	-
1669A ELIZABETH DRIVE, BADGERYS CREEK, NSW	Residential	45	40	40	36	55	65	-	31	-	31	34	-	-	-	-
1669A ELIZABETH DRIVE, BADGERYS CREEK, NSW	Non-receiver	999	999	999	999	None	None	-	31	-	31	34	-	-	-	-
931A MAMRE ROAD, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	31	-	31	34	-	-	-	-
1669A ELIZABETH DRIVE, BADGERYS CREEK, NSW	Non-receiver	999	999	999	999	None	None	-	31	-	31	34	-	-	-	-
1669A ELIZABETH DRIVE, BADGERYS CREEK, NSW	Non-receiver	999	999	999	999	None	None	-	30	-	30	33	-	-	-	-
235-245 CLIFTON AVENUE, KEMPS CREEK, NSW	Non-receiver	999	999	999	999	None	None	-	30	-	30	33	-	-	-	-

Receiver		Noise management levels (NMLs), dB(A)				Sleep disturbance goals, dB(A)		Predicted noise levels, dB(A) Leq,15min				Predicted noise levels, dB(A) Lmax	Additional mitigation			
Address	Land use	NML Day	NML Day (OOH)	NML Evening	NML Night	Lmax (screening)	Lmax (limit)	Day	Day (OOH)	Evening	Night	Night	Day	Day (OOH)	Evening	Night
885-899 MAMRE ROAD, KEMPS CREEK, NSW	Non-receiver	999	999	999	999	None	None	-	30	-	30	33	-	-	-	-
901 MAMRE ROAD, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	30	-	30	33	-	-	-	-
901 MAMRE ROAD, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	30	-	30	33	-	-	-	-
146B CLIFTON AVENUE, KEMPS CREEK, NSW	Residential	45	40	40	36	55	65	-	29	-	29	32	-	-	-	-
235-245 CLIFTON AVENUE, KEMPS CREEK, NSW	Non-receiver	999	999	999	999	None	None	-	29	-	29	32	-	-	-	-
919-929 MAMRE ROAD, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	29	-	29	32	-	-	-	-
1669A ELIZABETH DRIVE, BADGERYS CREEK, NSW	Non-receiver	999	999	999	999	None	None	-	29	-	29	32	-	-	-	-
235-245 CLIFTON AVENUE, KEMPS CREEK, NSW	Non-receiver	999	999	999	999	None	None	-	29	-	29	32	-	-	-	-
885-899 MAMRE ROAD, KEMPS CREEK, NSW	Non-receiver	999	999	999	999	None	None	-	29	-	29	32	-	-	-	-
885-899 MAMRE ROAD, KEMPS CREEK, NSW	Non-receiver	999	999	999	999	None	None	-	28	-	28	31	-	-	-	-
258 CLIFTON AVENUE, KEMPS CREEK, NSW	Non-receiver	999	999	999	999	None	None	-	28	-	28	31	-	-	-	-
931 MAMRE ROAD, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	27	-	27	30	-	-	-	-
919-929 MAMRE ROAD, KEMPS CREEK, NSW	Industrial	75	75	75	75	None	None	-	26	-	26	29	-	-	-	-
1725A ELIZABETH DRIVE, BADGERYS CREEK, NSW	Non-receiver	999	999	999	999	None	None	-	25	-	25	28	-	-	-	-
919-929 MAMRE ROAD, KEMPS CREEK, NSW	Non-receiver	999	999	999	999	None	None	-	22	-	22	25	-	-	-	-

APPENDIX C Noise level above nominated target

Noise level above NML Day (area 1 of 2)

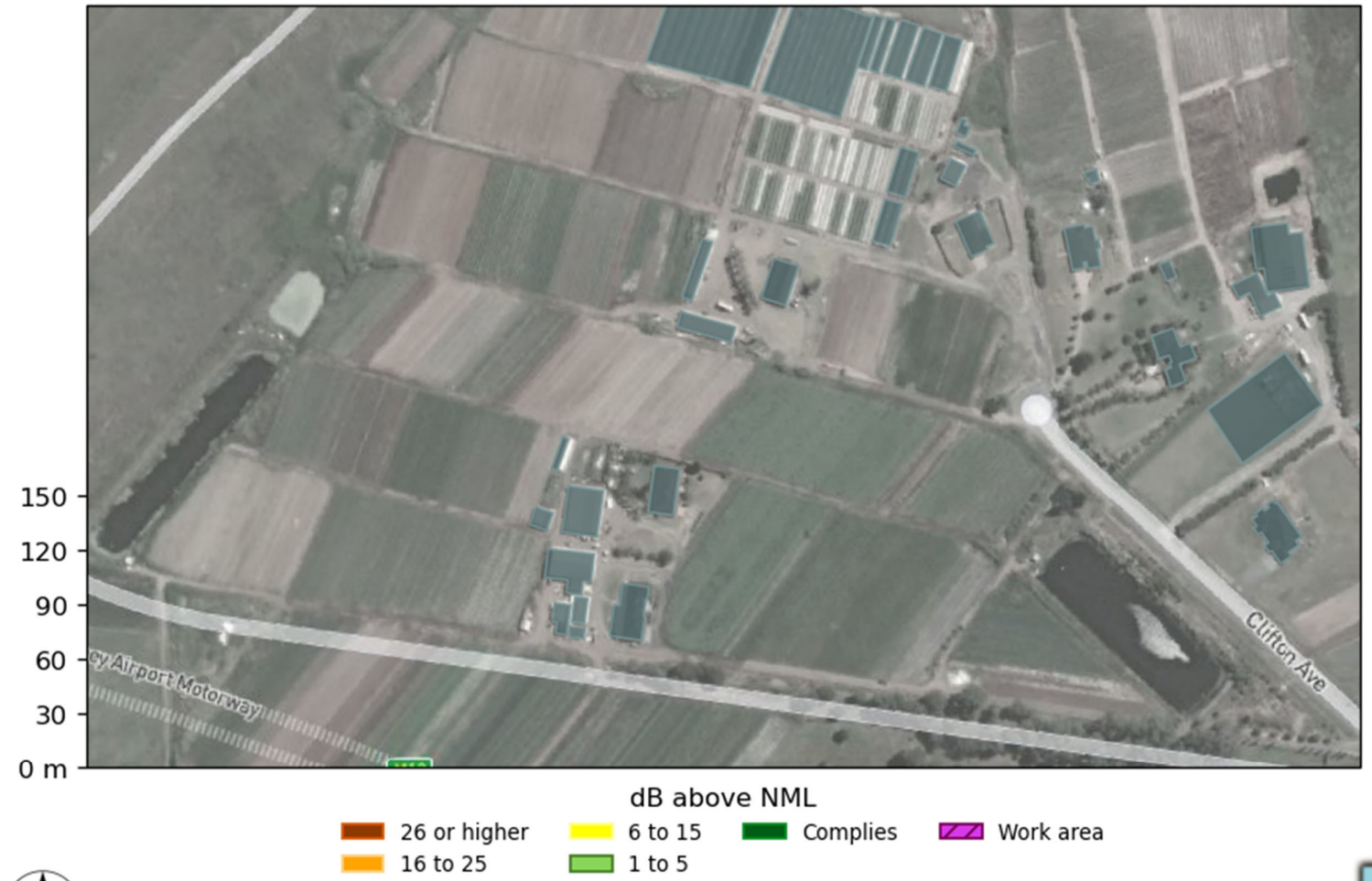


Noise level above NML Day (area 2 of 2)

Noise level above NML Day (OOH) (area 1 of 2)

Noise level above NML Day (OOH) (area 2 of 2)

Noise level above NML Evening (area 1 of 2)



Noise level above NML Evening (area 2 of 2)

Noise level above NML Night (area 1 of 2)

Noise level above NML Night (area 2 of 2)

Mechanical and Electrical Fit Out including Asphalt Works

*General Construction denotes the following – *structure construction* and *electrical and mechanical installation* in accordance with the activities specified in the CNVIS.

From: Renzo Tonin and Associates via Gatewave
Calculation scenario: **Extended Construction Hours AWRC - Structure Construction**
(Gatewave ID TM588_177)

Upper South Creek – Noise and Vibration Assessment Report

1 Introduction

The Renzo Tonin and Associates web-based construction assessment tool (Gatewave) has been used to prepare this noise and vibration assessment report for John Holland and the Upper South Creek Advanced Water Recycling Centre project (the Project).

The overall noise and vibration impacts from the Project works and associated mitigation measures (e.g. hoardings) have already been addressed in previous Construction Noise and Vibration Impact Statements (CNVIS) in accordance with CoA E48. This tool allows specific work areas and activities to be assessed as construction works progress. It also allows cumulative noise impact from other aspects of the Project or, where relevant noise from other construction projects, to be assessed and managed in accordance with the Construction Noise and Vibration Management Plan (USCP-JHG-MPL-ENV-0007, the 'CNVMP').

2 Assessment methodology

2.1 Construction noise

Results for the assessment of airborne noise were determined using a CadnaA computer noise model developed for the Project. The CadnaA noise model incorporates ground elevation contours, building heights, the built environment and atmospheric conditions to predict construction noise in accordance with the International Standard ISO 9613-2:1996 implementing quality standard ISO 17534-1:2015.

Results from the CadnaA noise model are exported and stored into the Gatewave database which allows for the prediction of the total cumulative noise from all construction activities.

A summary of the noise calculation parameters is detailed in Table 1.

Table 1: Summary of noise modelling parameters

Parameters	Inputs
Calculation method	ISO 9613-2:1996 implementing quality standard ISO 17534-1:2015
Location of noise sources above the local ground	1.5m
Height of receivers	1.5m above ground level to represent 1.5m above ground floor level Additional 3m height for every additional floor assessed (i.e. 4.5m above ground for first floor, 7.5m for second floor etc.)
Sound Power Levels (L_w) of plant and equipment	All Lw data obtained from Renzo Tonin & Associates database Detailed in Section 3
Construction activities	Detailed in Section 3
Ground absorption	Varying from 1 for absorptive surfaces (e.g. park land), 0.5 (e.g. residential areas) to 0 for reflective surfaces (e.g. water, concrete, paving);
Noise barriers and screening	As detailed in Project CNVIS

2.2 Construction vibration

If there are any vibration intensive plant and equipment, the recommended minimum working distances (MWD) are presented in Table 4.

3 Construction activities, work areas and NCAs

3.1 Justification to complete the works OOH

EPL Section 8 Special Conditions. E1 Community Agreement

3.2 Construction activities

3.2.1 Plant and equipment use

A summary of the plant and equipment operating during each assessment time period is presented in Table 2. Note that Table 2 identifies if a plant/equipment item is used for part or all of the assessment period on a given day, and does not necessarily denote if the plant/equipment are operating concurrently (refer APPENDIX A for details on which plant/equipment are operating together).

Table 2: Proposed construction activities and associated sound power levels

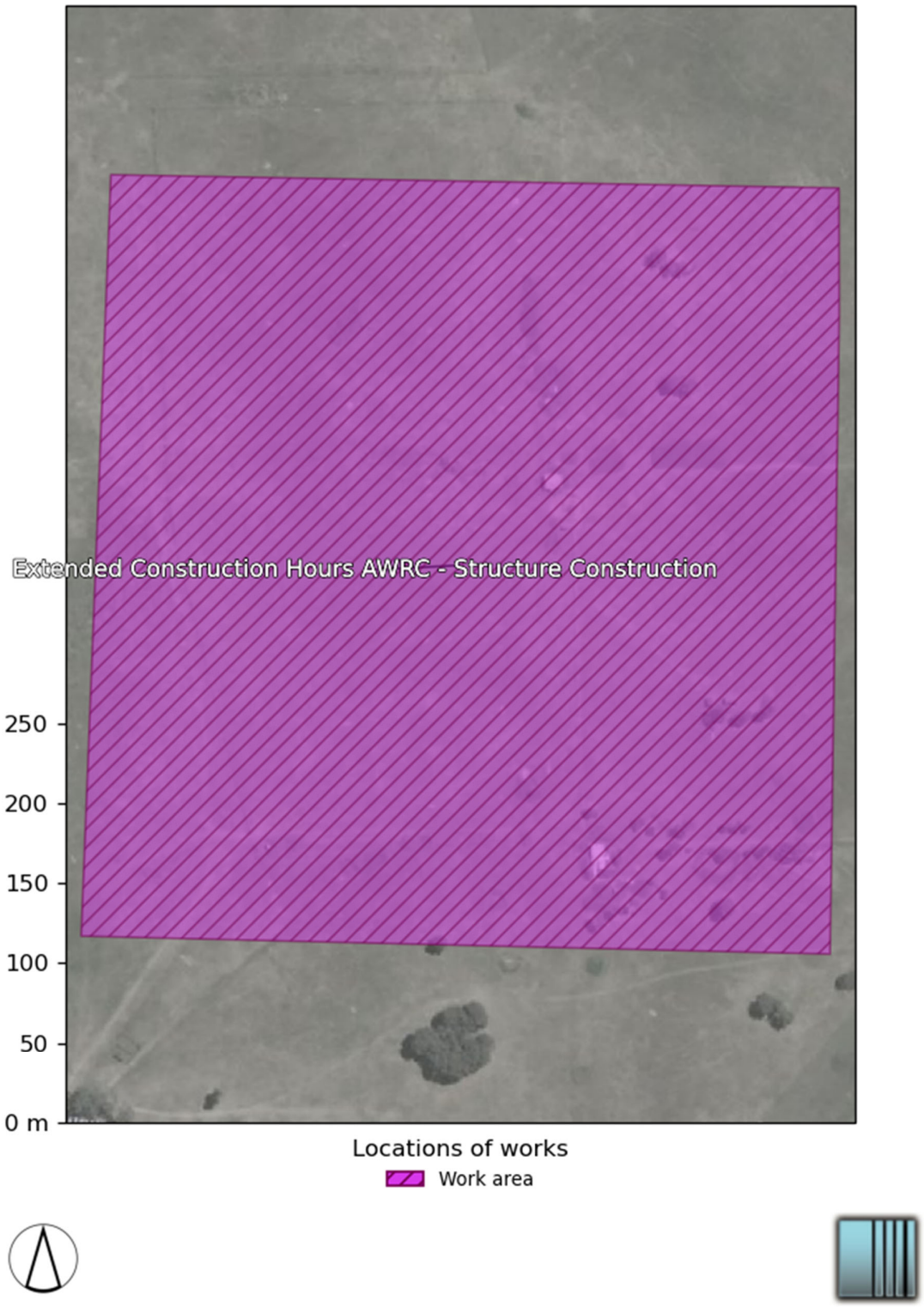
Activity/plant/equipment	Number in use				Sound power level, dB(A)		High impact item	Noise reduction from mitigation measures, dB(A)
	Day	Day (OOH)	Evening	Night	Leq	Lmax		
Extended Construction Hours AWRC - Structure Construction								
Concrete Agi	-	-	-	50	125	111	-	-
Mobile crane (20t-250t)	2	2	-	2	100	108	-	-
Piling Rig - vibratory	1	1	-	1	121	119	**Yes**	-
Concrete pump	2	2	-	2	105	107	-	-
Concrete vibrator	4	4	-	4	103	100	-	-
Light vehicles	6	6	-	6	87	100	-	-
Road truck (deliveries to site)	8	8	-	8	105	111	-	-
EWP	4	4	-	4	95	98	-	-
Telehander / Franna crane (20t)	2	2	-	2	99	103	-	-
Generator	2	2	-	2	97	95	-	-
Handtool - rattle gun	8	8	-	8	109	118	-	-
Water cart	2	2	-	2	101	107	-	-

Notes:

1) Refer APPENDIX A for plant/equipment timings and to identify which items operate concurrently.
2) Equipment marked in **orange** are not verified by Renzo Tonin and Associates

The locations of the construction activities are presented in Figure 1.

Figure 1: Construction work areas



4 Construction noise and vibration impacts

4.1 Predicted noise levels

4.1.1 Construction $L_{Aeq,15min}$ assessment

Noise levels were determined by modelling the noise sources, receiver locations, and operating activities, based on the information presented in Table 2.

The noise predictions presented in this report represent a realistic worst-case scenario when construction occurs at the closest location within a specific work area. At each receiver, noise levels will vary during the construction period based on the position of equipment within the work area, the distance to the receiver, the construction activities being undertaken and the noise levels of particular plant items and equipment. Actual noise levels will often be less than the predicted levels presented.

A summary of the results is presented in Table 3. NMLs and predictions for the three worst-affected receivers for each works area are provided in Table 5. Results are presented visually in noise maps in APPENDIX C.

Table 3: Summary of receivers above relevant NMLs

NCA	Day		Day (OOH)		Evening		Night	
	dB(A) above NML	No. of properties	dB(A) above NML	No. of properties	dB(A) above NML	No. of properties	dB(A) above NML	No. of properties
NCA T1	0 to 10	10	0 to 5	2	0 to 5		0 to 5	0
	> 10	0	6 to 15	10	6 to 15		6 to 15	7
	Over 75 dB(A)	0	16 to 25	0	16 to 25		16 to 25	5
			> 25	0	> 25		> 25	0
Industrial	0 to 10	0	0 to 5	0	0 to 5		0 to 5	0
	> 10	0	6 to 15	0	6 to 15		6 to 15	0
	Over 75 dB(A)	0	16 to 25	0	16 to 25		16 to 25	0
			> 25	0	> 25		> 25	0

4.2 Predicted vibration levels

The recommended MWDs for cosmetic damage and human annoyance are presented in Table 4.

Table 4: Generic minimum working distances for cosmetic damage and human annoyance

Plant item	Reference	Minimum working distance, m			
		Cosmetic damage (screening criteria)		Human comfort (screening limit)	
		Heritage buildings	Non-heritage	Residential[1]	Non-residential[2]
Piling Rig - vibratory	RTA PILING_010	50	20	225	100

Notes:

1. Screening limit for residences, night time
2. Screening limit for offices, schools, educational institutions and places of worship (day or night)

4.3 Mitigation measures

4.3.1 Specific reasonable and feasible mitigation measures

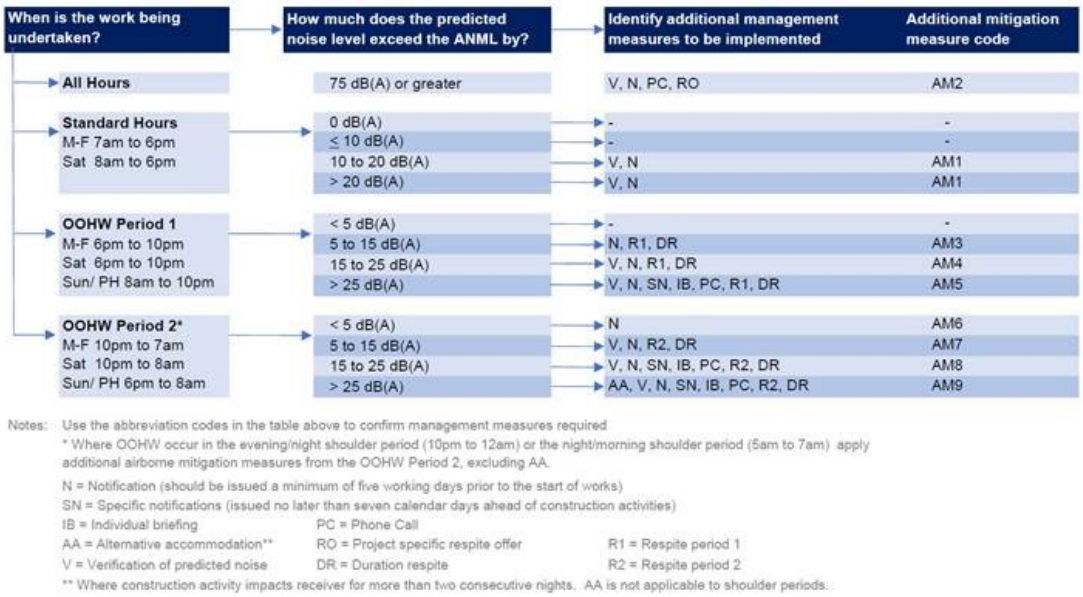
Site inductions will be carried out for all personnel to include potential impacts to sensitive receivers and worker behaviours. At the start of each shift a briefing regarding noise will be included as part of the pre-start to inform all personnel of the noise sensitivities of the area and works.

- Verification monitoring to be carried out at the start of out of hours works for each location to confirm predicted noise levels.
- Noise source observations to be carried out by the Environment Team at the start of the works with any additional mitigation measures or observations to be implemented.
- All equipment to be fitted with non-tonal reversing alarms.
- No swearing or unnecessary shouting or loud stereos/radios/phone calls on speaker on-site.
- No dropping of materials from height, throwing of metal items and slamming of doors
- Light vehicles and plants to be switched off when not in use.

4.3.2 Additional noise mitigation measures

In accordance with the CNVG, where, after application of all reasonable and feasible mitigation measures, the $L_{Aeq(15minute)}$ airborne construction noise levels are still predicted to exceed the NMLs, additional airborne noise mitigation measures can be applied to further limit the risk of annoyance from construction noise.

Figure 2: Additional airborne noise mitigation measures



When is the work being undertaken?	How much does the predicted noise level exceed the ANML by?	Identify additional management measures to be implemented	Additional mitigation measure code
All Hours	75 dB(A) or greater	V, N, PC, RO	AM2
Standard Hours M-F 7am to 6pm Sat 8am to 6pm	0 dB(A)	-	-
	≤ 10 dB(A)	-	-
	10 to 20 dB(A)	V, N	AM1
	> 20 dB(A)	V, N	AM1
OOHW Period 1 M-F 6pm to 10pm Sat 6pm to 10pm Sun/ PH 8am to 10pm	< 5 dB(A)	-	-
	5 to 15 dB(A)	N, R1, DR	AM3
	15 to 25 dB(A)	V, N, R1, DR	AM4
	> 25 dB(A)	V, N, SN, IB, PC, R1, DR	AM5
OOHW Period 2* M-F 10pm to 7am Sat 10pm to 8am Sun/ PH 6pm to 8am	< 5 dB(A)	N	AM6
	5 to 15 dB(A)	V, N, R2, DR	AM7
	15 to 25 dB(A)	V, N, SN, IB, PC, R2, DR	AM8
	> 25 dB(A)	AA, V, N, SN, IB, PC, R2, DR	AM9

Notes: Use the abbreviation codes in the table above to confirm management measures required
* Where OOHW occur in the evening/night shoulder period (10pm to 12am) or the night/morning shoulder period (5am to 7am) apply additional airborne mitigation measures from the OOHW Period 2, excluding AA.
N = Notification (should be issued a minimum of five working days prior to the start of works)
SN = Specific notifications (issued no later than seven calendar days ahead of construction activities)
IB = Individual briefing PC = Phone Call
AA = Alternative accommodation** RO = Project specific respite offer R1 = Respite period 1
V = Verification of predicted noise DR = Duration respite R2 = Respite period 2
** Where construction activity impacts receiver for more than two consecutive nights. AA is not applicable to shoulder periods.

4.3.3 Noise monitoring plan

Attended noise monitoring is to be undertaken to verify that noise levels resulting from works are in accordance with the levels predicted in this noise and vibration assessment report, subject to obtaining the property owner/occupier's consent to access the property (where required). Noise monitoring should be carried out on or near the property boundary at a location representative of the worst affected location (i.e. in publicly accessible areas on or near the nominated receivers, typically at ground level).

Table 5 identifies potential monitoring locations in each NCA, which are the three worst noise-affected receivers for each NCA from the works.

Note: Gatewave tries to find the most affected receivers in each NCA (up to 3 locations) purely based on the numerical results. These locations will be reviewed for suitability based on safety, accessibility, will provide valid data, etc. If not suitable, alternative suitable locations will be selected for verification monitoring.

If monitoring levels exceed predicted levels, continual improvement and corrective action measures will be implemented, (e.g. investigate cause, review work or activity, scheduling, etc).

Table 5: Nominated verification monitoring locations

Receiver			Noise management levels (NMLs), dB(A)				Sleep disturbance goals, dB(A)		Predicted noise levels, dB(A) Leq,15min				Predicted noise levels, dB(A) Lmax
NCA	Address	Land use	NML Day	NML Day (OOH)	NML Evening	NML Night	Lmax (screening)	Lmax (limit)	Day	Day (OOH)	Evening	Night	Night
NCA T1	230-234 CLIFTON AVENUE, KEMPS CREEK, NSW	Residential	45	40	40	36	55	65	52	52	-	56	50
NCA T1	203-229 CLIFTON AVENUE, KEMPS CREEK, NSW	Residential	45	40	40	36	55	65	51	51	-	55	49
NCA T1	146B CLIFTON AVENUE, KEMPS CREEK, NSW	Residential	45	40	40	36	55	65	51	51	-	55	49

4.3.4 Vibration monitoring

It is noted that the generic MWDs in Table 4 are taken from a database of vibration levels measured at various sites or obtained from other sources (e.g. BS5228-2:2009). They are not specific to these works as final vibration levels are dependent on many factors including the actual plant used, its operation and the intervening geology between the activity and the receiver.

Site specific MWDs for vibration significant plant items must be measured on site where plant and equipment are likely to operate close to or within the generic MWDs for both cosmetic damage and human annoyance. These site specific MWDs will then be included in Gatewave.

If works are likely to be within the generic or site specific MWDs, attended vibration monitoring is to be undertaken to verify that vibration levels comply with the vibration objectives described in the CNVMP.

Additional monitoring for human annoyance from vibration would be carried out proactively and in response to vibration complaints.

Vibration monitoring should follow the procedures outlined in Appendix F of the CNVG.

Important disclaimer

* This document has been partly automatically generated by Gatewave ™, software for prediction, assessment and management of noise and vibration, developed by Renzo Tonin and Associates.

* This document is uncontrolled. Please contact Renzo Tonin and Associates if you suspect there are any errors in this report.

* Results in this report are based on the assumptions described in Section 0 and inputs presented in Section 3. Noise and vibration monitoring data will be collected to ensure Gatewave is verified and adjusted, if required.

* Renzo Tonin and Associates cannot be held liable for the misuse of the software Gatewave ™, including any errors that may be contained within the software.

APPENDIX A Summary of works

A.1 Plant and equipment

Table 6: Plant and equipment schedule for work area: **Extended Construction Hours AWRC - Structure Construction**

Equipment	Penalty, dB(A)	Quantity	Intensity	Reduction, dB	Sound power level, dB(A)		Start time	End time
					$L_{eq,15min}$	L_{max}		
Extended Construction Hours AWRC - Structure Construction								
Concrete Agi	-	50	100%	0	125	111	Monday - Friday 05:00:00	Monday - Friday 07:00:00
	-	50	100%	0	125	111	Saturday 06:00:00	Saturday 18:00:00
Mobile crane (20t-250t)	-	2	20%	0	100	108	Monday - Friday 05:00:00	Monday - Friday 07:00:00
							Saturday 06:00:00	Saturday 18:00:00
Piling Rig - vibratory	5	1	100%	0	121	119	Monday - Friday 05:00:00	Monday - Friday 07:00:00
							Saturday 06:00:00	Saturday 18:00:00
Concrete pump	-	2	80%	0	105	107	Monday - Friday 05:00:00	Monday - Friday 07:00:00
							Saturday 06:00:00	Saturday 18:00:00
Concrete vibrator	-	4	100%	0	103	100	Monday - Friday 05:00:00	Monday - Friday 07:00:00
							Saturday 06:00:00	Saturday 18:00:00
Light vehicles	-	6	10%	0	87	100	Monday - Friday 05:00:00	Monday - Friday 07:00:00
							Saturday 06:00:00	Saturday 18:00:00
Road truck (deliveries to site)	-	8	10%	0	105	111	Monday - Friday 05:00:00	Monday - Friday 07:00:00
							Saturday 06:00:00	Saturday 18:00:00
EWP	-	4	25%	0	95	98	Monday - Friday 05:00:00	Monday - Friday 07:00:00
							Saturday 06:00:00	Saturday 18:00:00
	-	2	50%	0	99	103	Monday - Friday 05:00:00	Monday - Friday 07:00:00

Equipment	Penalty, dB(A)	Quantity	Intensity	Reduction, dB	Sound power level, dB(A)		Start time	End time
					$L_{eq,15min}$	L_{max}		
Telehander / Franna crane (20t)							Saturday 06:00:00	Saturday 18:00:00
Generator	-	2	100%	0	97	95	Monday - Friday 05:00:00	Monday - Friday 07:00:00
							Saturday 06:00:00	Saturday 18:00:00
Handtool - rattle gun	-	8	20%	0	109	118	Monday - Friday 05:00:00	Monday - Friday 07:00:00
							Saturday 06:00:00	Saturday 18:00:00
Water cart	-	2	25%	0	101	107	Monday - Friday 05:00:00	Monday - Friday 07:00:00
							Saturday 06:00:00	Saturday 18:00:00

APPENDIX B Detailed construction noise results

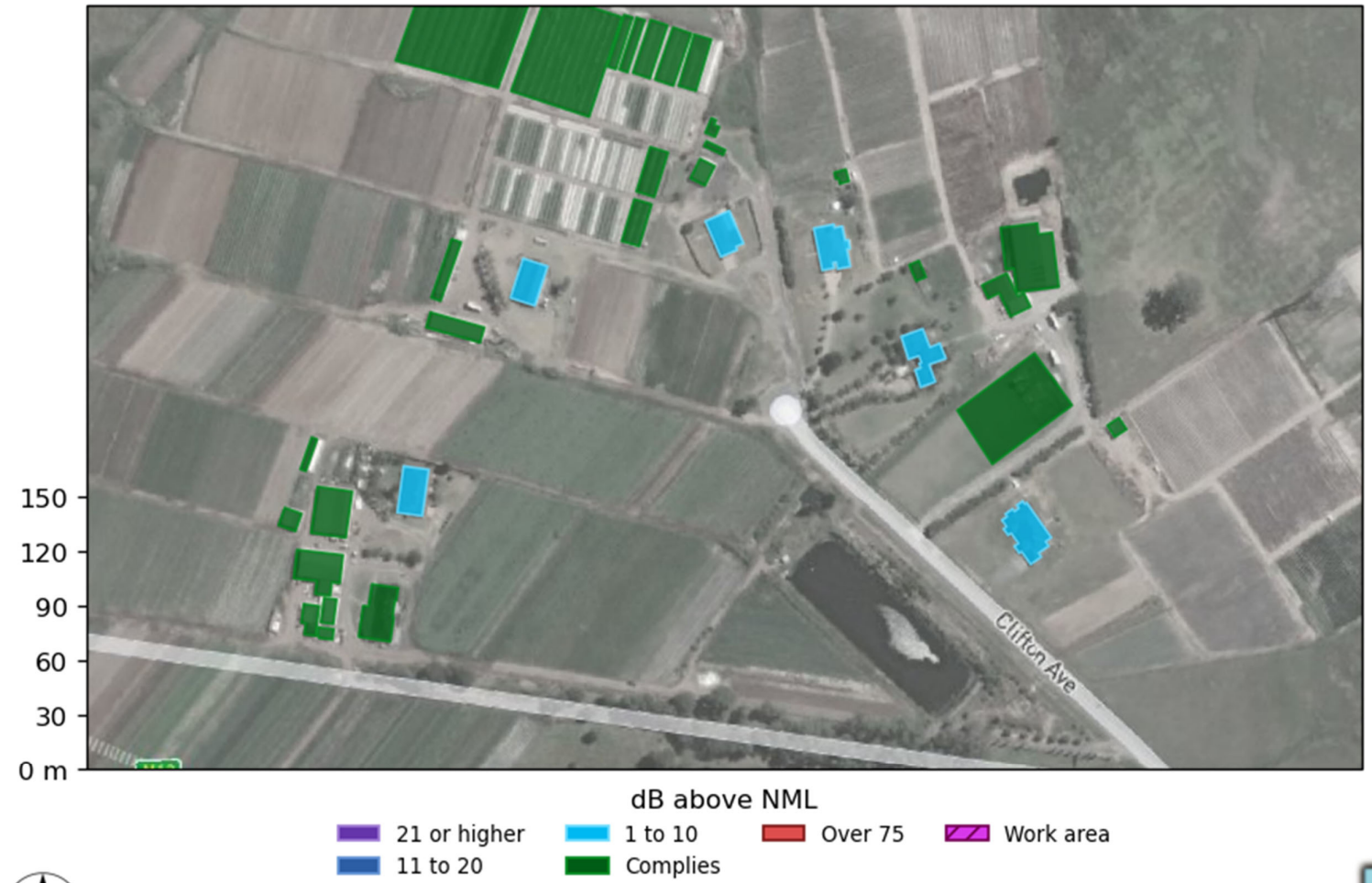
Table 7: Construction noise results

Receiver		Noise management levels (NMLs), dB(A)				Sleep disturbance goals, dB(A)		Predicted noise levels, dB(A) Leq,15min				Predicted noise levels, dB(A) Lmax
Address	Land use	NML Day	NML Day (OOH)	NML Evening	NML Night	Lmax (screening)	Lmax (limit)	Day	Day (OOH)	Evening	Night	Night
230-234 CLIFTON AVENUE, KEMPS CREEK, NSW	Residential	45	40	40	36	55	65	-	56	-	56	50
203-229 CLIFTON AVENUE, KEMPS CREEK, NSW	Residential	45	40	40	36	55	65	-	55	-	55	49
146B CLIFTON AVENUE, KEMPS CREEK, NSW	Residential	45	40	40	36	55	65	-	55	-	55	49
919-929 MAMRE ROAD, KEMPS CREEK, NSW	Residential	45	40	40	36	55	65	-	52	-	52	46
237-247 CLIFTON AVENUE, KEMPS CREEK, NSW	Residential	45	40	40	36	55	65	-	52	-	52	46
235-245 CLIFTON AVENUE, KEMPS CREEK, NSW[1]	Residential	45	40	40	36	55	65	-	51	-	51	45
949-965 MAMRE ROAD, KEMPS CREEK, NSW	Residential	45	40	40	36	55	65	-	51	-	51	45
230-234 CLIFTON AVENUE, KEMPS CREEK, NSW	Residential	45	40	40	36	55	65	-	51	-	51	45
258 CLIFTON AVENUE, KEMPS CREEK, NSW	Residential	45	40	40	36	55	65	-	51	-	51	45
1669A ELIZABETH DRIVE, BADGERYS CREEK, NSW	Residential	45	40	40	36	55	65	-	50	-	50	44
1669A ELIZABETH DRIVE, BADGERYS CREEK, NSW	Residential	45	40	40	36	55	65	-	48	-	48	42
146B CLIFTON AVENUE, KEMPS CREEK, NSW	Residential	45	40	40	36	55	65	-	46	-	46	40

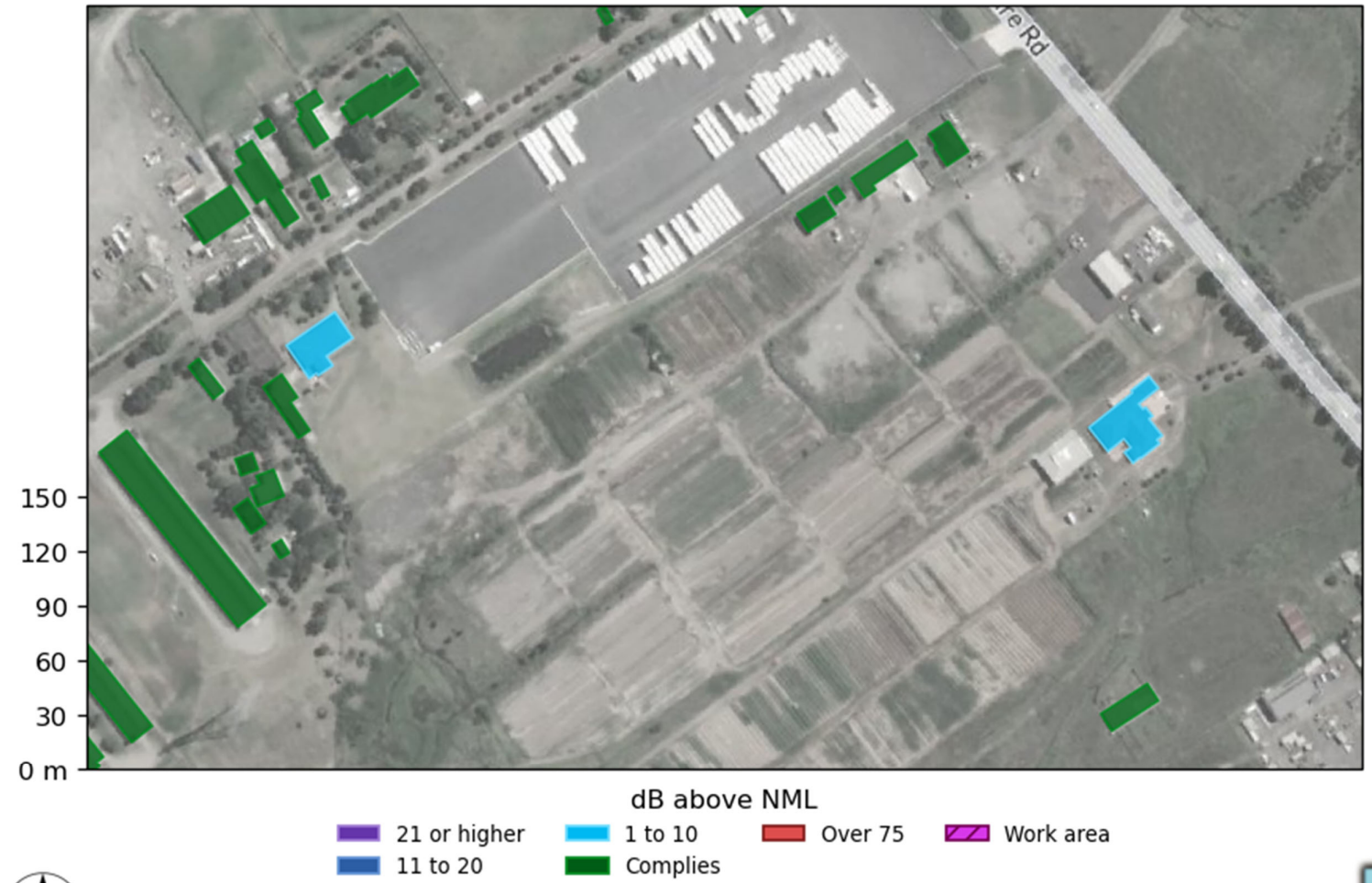
Note: [1]237-247 Clifton Avenue does not exist, the receiver is replaced with 257 Clifton Avenue which is not identified in the noise model.

APPENDIX C Noise level above nominated target

Noise level above NML Day (area 1 of 4)

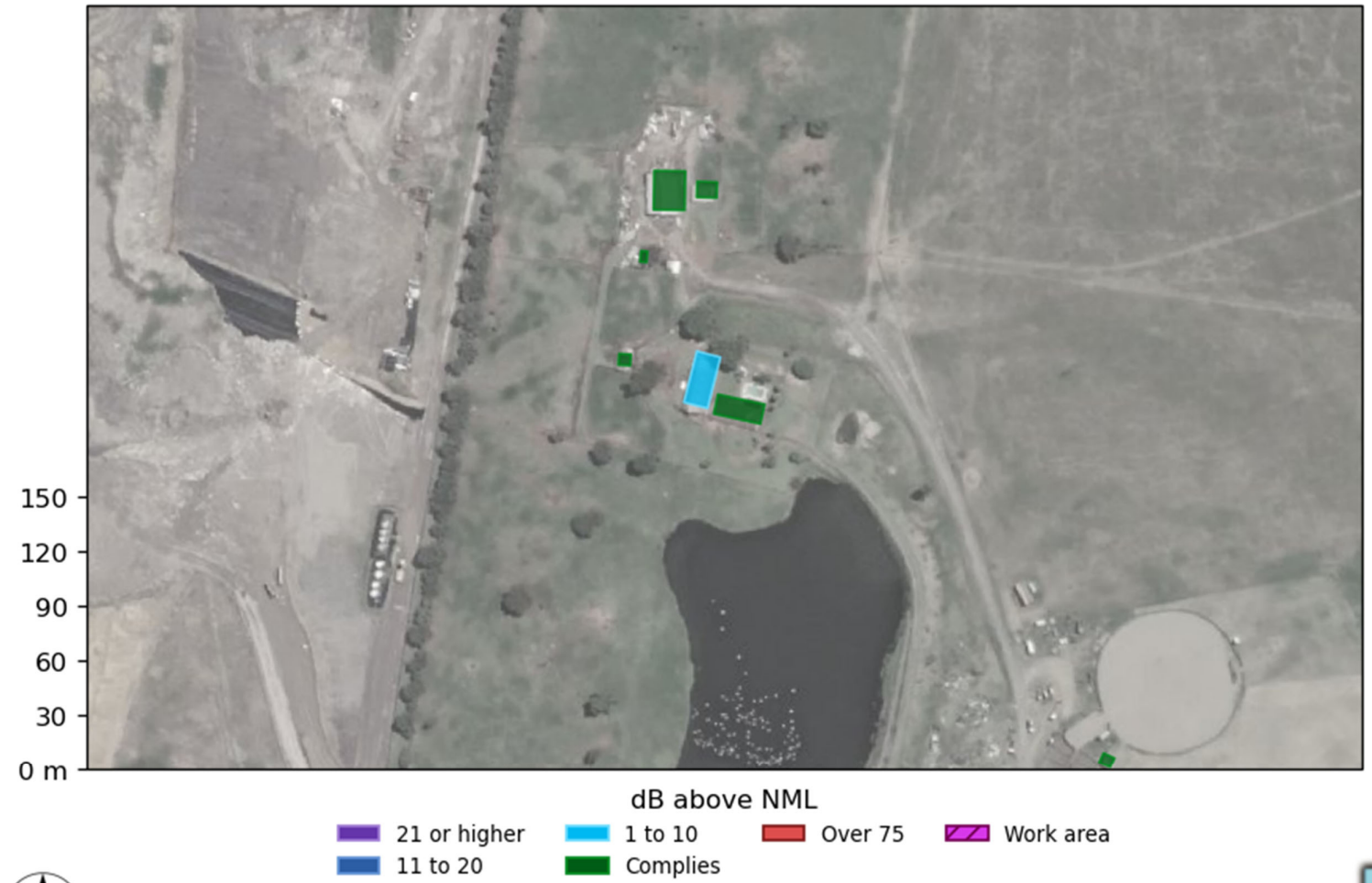


Noise level above NML Day (area 2 of 4)



Noise level above NML Day (area 3 of 4)

Noise level above NML Day (area 4 of 4)



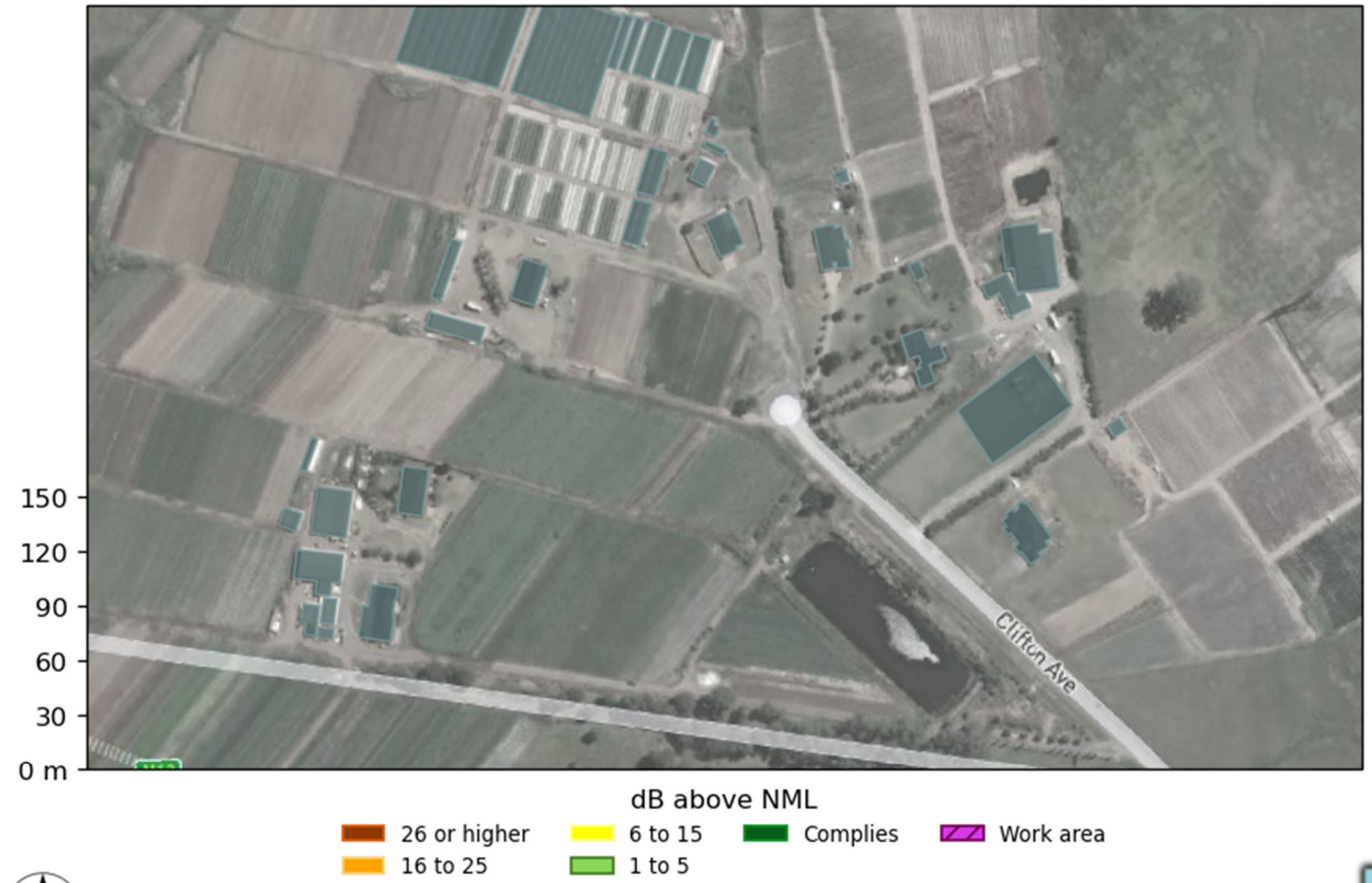
Noise level above NML Day (OOH) (area 1 of 4)

Noise level above NML Day (OOH) (area 2 of 4)

Noise level above NML Day (OOH) (area 3 of 4)

Noise level above NML Day (OOH) (area 4 of 4)

Noise level above NML Evening (area 1 of 4)



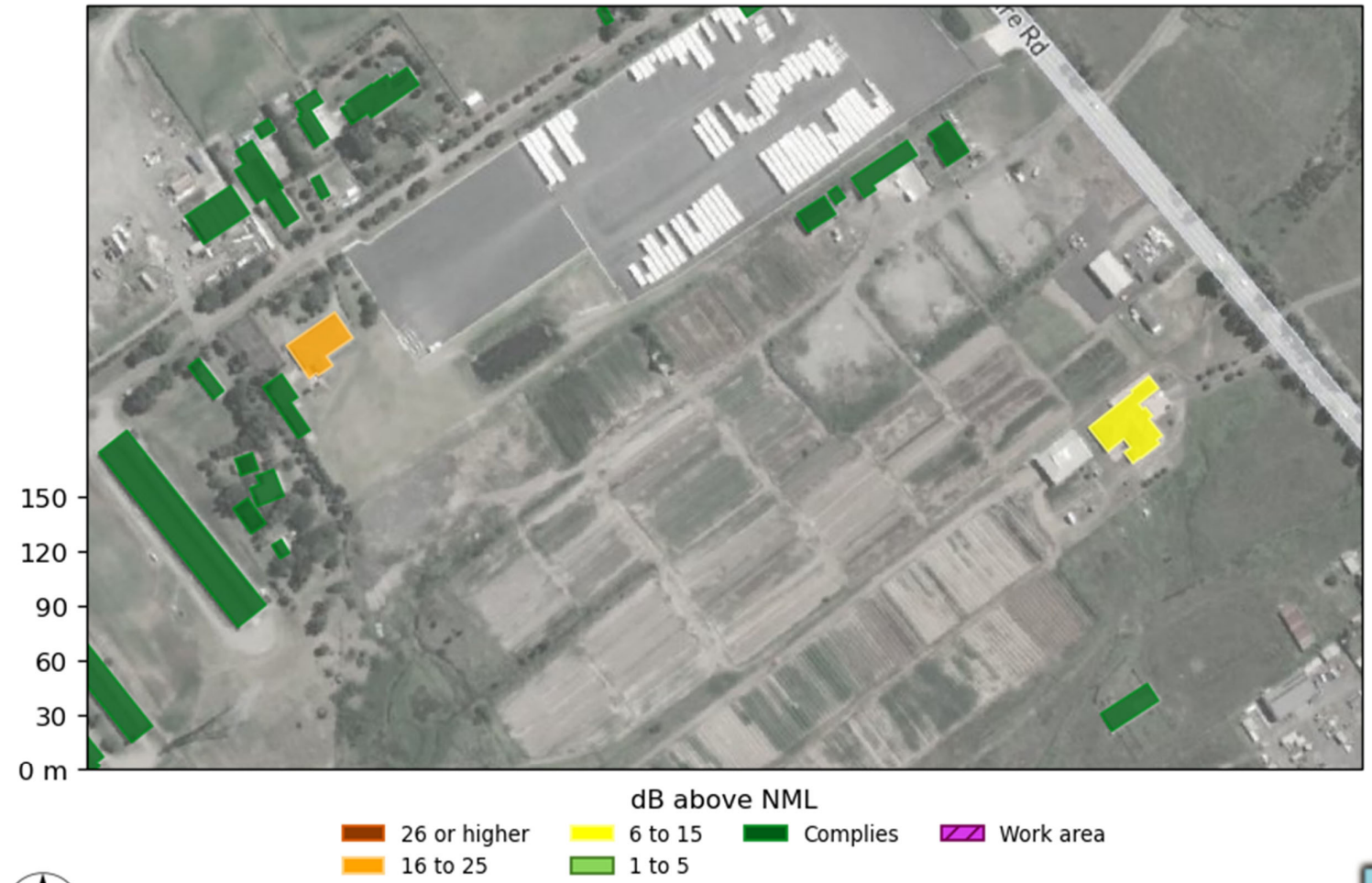
Noise level above NML Evening (area 2 of 4)

Noise level above NML Evening (area 3 of 4)

Noise level above NML Evening (area 4 of 4)

Noise level above NML Night (area 1 of 4)

Noise level above NML Night (area 2 of 4)



Noise level above NML Night (area 3 of 4)

Noise level above NML Night (area 4 of 4)