31 May 2019

Hornsby Shire Council
Caroline Maeshian
296 Peats Ferry Road,
Hornsby 2077

Our ref: 2126457-77347
Your ref:

Dear Caroline

Hornsby Quarry Rehabilitation EIS
Response to request for additional information regarding noise

1 Introduction

GHD prepared a Noise and Vibration Impact Assessment (NVIA) for the construction activities associated with the Hornsby Quarry Rehabilitation EIS. The development application involves:

- Rehabilitation, stabilisation and geotechnical safety management works around various parts of the site; and
- Earthworks and placement of material from within the site to create a final landform suitable for future development into a community parkland.

The report addressed the potential noise and vibration impacts from the proposed construction activities at Hornsby Quarry in accordance with the Secretary's Environmental Assessment Requirements (SEARs 1167) for the project which refers to the Interim Construction Noise Guideline (DECC, 2009) and the Industrial Noise Policy (EPA, 2000), which has been superseded by the Noise Policy for Industry (EPA, 2017) – the NPfI.

Section 1.5 of the NPfI specifically states that it does not apply to "Construction Activities".

The Interim Construction Noise Guideline (DECC, 2009) is applicable to construction activities and has been adopted for this assessment.

The NVIA prepared by GHD identified the noise sensitive receivers potentially affected by the construction activities, assessed the likely noise impacts from various construction scenarios, and provided noise mitigation recommendations.

2 EPA response to EIS

The NSW Environment Protection Authority (EPA) provided a response to the Hornsby Quarry EIS (DOC19/276083-1 dated 10 May 2019) with regards to the noise and vibration assessment requesting further information.

The response says that the EPA is unable to provide approval due to the noise impacts identified and have requested further noise mitigation measures and assessment.

GHD Pty Ltd ABN 39 008 488 373
Level 15 133 Castlereagh Street Sydney New South Wales 2000 Australia
T +61 2 9239 7100 **F** +61 2 9239 7199 **E** sydmail@ghd.com **W** www.ghd.com

The EPA has raised the concerns or requests for additional information itemised below:

1. *The EPA has concerns that a number of noise sensitive receivers will be highly affected by the construction noise activities and therefore requests that the following additional information be provided.*
2. *For each of the noise sensitive receivers that are predicted to exceed the NML, please indicate the specific mitigation measures proposed to minimise noise impacts;*
3. *For each of the noise sensitive receivers that are predicted to exceed the NML, detail the attenuation that will be achieved;*
4. *For each of the noise sensitive receivers that are predicted to exceed the NML, identify the revised noise impact level predictions following mitigation; and*
5. *Where relevant NML cannot be met after application of all feasible and cost -effective mitigation measures, please outline any community engagement options proposed to inform and consult with the community in resolving the issues.*

The following sections provide GHD's response to the items raised.

3 Response to EPA requests

Item 1: The EPA has concerns that a number of noise sensitive receivers will be highly affected by the construction noise activities and therefore requests that the following additional information be provided.

The construction activities are to be conducted during recommended standard hours:

- Monday to Friday: 7:00 am to 6:00 pm
- Saturday: 8:00 am to 1:00 pm
- No work on Sundays or Public Holidays

For recommended standard hours, the Interim Construction Noise Guideline (DECC, 2009) provides construction noise management levels for construction activities as follows:

- The *'noise affected'* level which represents the point above which there may be some community reaction to noise: Background + 10 dBA
- The *'highly noise affected'* level which represents the point above which there may be strong community reaction to noise: 75 dBA

The NVIA provides conservative predictions of construction noise based on an indicative construction schedule and activities. At the pre-approval stage of the project, details of construction equipment, construction activities, construction scheduled and specific mitigation are limited as a construction contractor has not been engaged.

Given this level of uncertainty, the predictions of noise levels at sensitive receivers during the environmental assessment phase are conservative in nature. The predicted noise levels for all sensitive receivers and all construction activities (including rock breaking) are predicted to be below the '*highly noise affected'* construction noise management level.

Therefore in accordance with the Interim Construction Noise Guideline (DECC, 2009) no noise sensitive receivers are considered *'highly noise affected'.*

It is noted that some sensitive receivers are predicted to be *'noise affected'.* The Interim Construction Noise Guideline (DECC, 2009) recommends that the following actions be undertaken to manage noise during the construction phase of the project:

- the proponent should apply all feasible and reasonable work practices to meet the noise affected level
- the proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.

The Interim Construction Noise Guideline (DECC, 2009) Section 7.2 provides guidance on managing construction noise impacts through the various stages of the planning approvals process. This guidance is appended in Appendix A. The ICNG recommends:

- **Pre-approval:** conceptual description of feasible and reasonable work practices are provided during the pre-approval phase of the project. It is noted that this information has been provided in the NVIA along with additional details in the following sections of this letter
- **Post approvals**: detailed examination of feasible and reasonable work practices, strategies to deal with noise complaints and procedures for notifying nearby residents of upcoming works are provided during the post-approval phase of the project. These are recommended to be addressed in a Construction Noise Management Plan (CNMP) and Community Consultation Plan (CCP).

It is recommended that a CNMP is prepared post approval, after the construction contractor has been engaged and prepared its construction methodology. The CNMP would include a review of the construction noise predictions during the environmental impact assessment phase based on the construction contractor's methodology, and revised accordingly to include a detailed examination of feasible and reasonable work practices and noise mitigation measures to manage sensitive receivers that are predicted to be *'noise affected'.* The CNMP would include a CCP to liaise with the noise affected receivers.

Item 2: For each of the noise sensitive receivers that are predicted to exceed the NML, please indicate the specific mitigation measures proposed to minimise noise impacts.

Specific mitigation measures would be developed as part of the CNMP after the construction contractor is engaged and prepared their construction methodology. As discussed in item 1 above, in accordance with the Interim Construction Noise Guideline (DECC, 2009), a conceptual description of feasible and reasonable work practices is provided in the pre-approval phase of the project.

The NVIA has reviewed or provided the following conceptual measures:

- Source mitigation in NVIA Section 7.3.1, which includes recommendations to plant and equipment to be included in the CNMP. At this stage of the project specific detail is not available.
- Transmission mitigation in NVIA Section 7.3.2, which includes a review of a 5 m noise barrier. It was determined that noise mitigation measures in transmission were not feasible or reasonable to construct due to the terrain of the project site, the size of the barrier required, the associated cost,

the minimal amount of noise level reduction achieved and the short term nature of the construction project.

- Receiver mitigation in NVIA Section 7.3.3, which are not considered reasonable as construction noise is not predicted to result in any highly noise affected impacts, it is temporary in nature and at receiver treatment would not be cost-effective due to large number of sensitive receivers surrounding the site.

Item 3: For each of the noise sensitive receivers that are predicted to exceed the NML, detail the attenuation that will be achieved.

The achieved attenuation cannot be provided with certainty at the pre-approval stage of the project as the specific details of the construction methodology have not been determined. Following the preparation of the CNMP and compliance monitoring, the achieved attenuation could be determined.

However noise mitigation at source has been conceptually discussed in the NVIA. Information provided in Australian Standard AS 2436 *Guide to noise and vibration control on construction, demolition and maintenance sites* indicates that source noise levels can typically be reduced by 5-10 dBA with the incorporation of silencers, mufflers or diffusers, or substituting the equipment for a quieter item.

Item 4: For each of the noise sensitive receivers that are predicted to exceed the NML, identify the revised noise impact level predictions following mitigation.

Appendix B provides a summary of the predicted noise levels at residential receivers for scenarios where it may be possible to achieve a 10 dBA reduction due to reduction of noise level at the source. The reduction has not been applied to scenarios where rock breaking is involved.

The results demonstrate that the number of exceedances, and maximum exceedance above the noise management level can be significantly reduced if lower noise equipment is selected. Note that the 10 dBA reduction is indicative at this stage and should be assessed during the CNMP once the methodology and equipment have been selected.

Item 5: Where relevant NML cannot be met after application of all feasible and cost -effective mitigation measures, please outline any community engagement options proposed to inform and consult with the community in resolving the issues.

The Interim Construction Noise Guideline (DECC, 2009) recommends the following community engagement to be undertaken to manage noise during the construction phase of the project where sensitive receivers are predicted to be *'noise affected'* (and not *'highly noise affected'*) and construction activities are undertaken during recommended standard hours:

- *the proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.*

A Community Consultation Plan will be developed during the post-approvals phase of the project, as recommended by the Interim Construction Noise Guideline (DECC, 2009) Section 7.2, to inform and consult with the community.

Sincerely
GHD

Chris Gordon
Senior acoustic engineer
02 9239 7072

Appendix A – ICNG noise management tools during planning approval process.

Table 11: Summary of noise management tools at various stages in the planning approval process

Type and function of document	Typical information included
Pre-approval	
EIA documentation This conceptually describes the proposal, the likely noise impacts and work practices to minimise the noise impacts.	• Description of proposed works and proposed duration • Identification of nearby residences and other sensitive land uses • Assessment of likely noise impacts • Conceptual description of feasible and reasonable work practices to minimise noise impacts • Changes made to the proposal in response to submissions or representations received.
Post-approval	
Construction Noise Management Plan This describes in detail the methods that will be implemented for the whole project to minimise the noise impacts.	• Identification of nearby residences and other sensitive land uses • Assessment of expected noise impacts • Detailed examination of feasible and reasonable work practices that will be implemented to minimise noise impacts • Strategies to promptly deal with and address noise complaints • Details of performance evaluating procedures (for example, noise monitoring or checking work practices and equipment) • Procedures for notifying nearby residents of forthcoming works that are likely to produce noise impacts • Reference to relevant licence and consent conditions.
Construction Method Statement This describes in detail the methods that will be implemented at a specific site to minimise a range of impacts from the works. Noise is often a key issue for a Construction Method Statement, but not the only issue.	
Community Consultation Plan This describes in detail the methods that will be implemented, for the whole project, to liaise with affected community members to advise on and respond to noise-related complaints and disputes.	
All stages	
Industry Best Practice Environment Manual This contains further information on best practice that the industry would expect to be used on their construction projects when assessing and managing noise impacts.	• Clarification of specific aspects of noise management to promote a better understanding • Standardisation of best practice approaches where appropriate.

Appendix B Summary of predicted noise levels based on conceptual source treatments (with and without noise mitigation)

NCA	NML	Without mitigation				With at source mitigation - assumed 10 dBA reduction			
		Max level in NCA	Avg. level in NCA	Max. exc. above NML	No. of exc. above NML	Max level in NCA	Avg. level in NCA	Max. exc. above NML	No. of exc. above NML
CS1A – Existing terrain, no rock breaking works (West, Quarry)									
NCA01	45	67	44	22	117	57	34	12	58
NCA02	49	65	42	16	67	55	32	6	24
NCA03	47	61	41	14	62	51	31	4	23
NCA04	45	62	54	18	112	52	44	8	62
Total					358				167
CS1C – Design terrain, no rock breaking works (West, Quarry)									
NCA01	45	67	44	22	117	57	34	12	58
NCA02	49	65	42	16	67	55	32	6	24
NCA03	47	61	41	14	62	51	31	4	23
NCA04	45	62	54	18	113	52	44	8	62
Total					359				167
CS2A – Existing terrain, no rock breaking works (North, East & Quarry)									
NCA01	45	68	43	23	109	58	33	13	58
NCA02	49	66	40	17	78	56	30	7	26
NCA03	47	60	40	13	58	50	30	3	18
NCA04	45	50	46	5	101	40	36	-5	0
Total					346				102

NCA	NML	Without mitigation				With at source mitigation - assumed 10 dBA reduction			
		Max level in NCA	Avg. level in NCA	Max. exc. above NML	No. of exc. above NML	Max level in NCA	Avg. level in NCA	Max. exc. above NML	No. of exc. above NML
CS2B – Existing terrain, no rock breaking works (North, East & Quarry)									
NCA01	45	68	45	23	120	58	35	13	69
NCA02	49	66	43	17	119	56	33	7	26
NCA03	47	60	42	13	75	50	32	3	22
NCA04	45	58	51	13	110	48	41	3	13
Total					424				130
CS2C – Design terrain, no rock breaking works (North, East & Quarry)									
NCA01	45	68	43	23	110	58	33	13	58
NCA02	49	66	40	17	78	56	30	7	26
NCA03	47	60	40	13	58	50	30	3	18
NCA04	45	51	46	6	101	41	36	-4	0
Total					347				102
CS3A – Existing terrain, no rock breaking works (West, East & Quarry)									
NCA01	45	64	42	19	111	54	32	9	41
NCA02	49	66	40	17	77	56	30	7	26
NCA03	47	60	40	13	62	50	30	3	22
NCA04	45	60	52	16	112	50	42	6	32
Total					362				121
CS3C – Design terrain, no rock breaking works (West, East & Quarry)									
NCA01	45	64	42	19	111	54	32	9	41

NCA	NML	Without mitigation				With at source mitigation - assumed 10 dBA reduction			
		Max level in NCA	Avg. level in NCA	Max. exc. above NML	No. of exc. above NML	Max level in NCA	Avg. level in NCA	Max. exc. above NML	No. of exc. above NML
NCA02	49	66	40	17	77	56	30	7	26
NCA03	47	60	40	13	63	50	30	3	22
NCA04	45	60	52	16	113	50	42	6	32
Total					364				121

20 August 2019

Hornsby Shire Council
Craig Clendenning
296 Peats Ferry Road,
Hornsby 2077

Our ref: 2126457-77347
Your ref:

Dear Craig

Hornsby Quarry Rehabilitation EIS
Response to EPA request for additional comments

1 Introduction

GHD prepared a Noise and Vibration Impact Assessment (NVIA) for the construction activities associated with the Hornsby Quarry Rehabilitation EIS. The Environmental Protection Authority (EPA) has requested additional information relating to the NVIA prior to the issue of General Terms of Approval (GTA) for the development application.

This letter provides a response to the NSW Environment Protection Authority (EPA) request for further information about the noise and vibration assessment (DOC19/276083-1 dated 10 May 2019).

2 EPA request for additional information

2.1 DA request for additional information – DA 101 2019 – Hornsby Park

1. *The Environment Protection Authority ("EPA") has reviewed the additional noise information (GHD ref 2126457-77347) provided for Application DA/101/2019 at Hornsby Quarry.*

   The response has not adequately addressed the concerns raised by the EPA regarding construction noise impacts. Specifically, it has not provided sufficient information on the duration and extent of noise impacts from each work phase at each noise catchment area; or evaluated whether the assumed 10 dB(A) reduction in noise from construction activities can be achieved. Furthermore, it does not address how residual impacts will be managed or how the community will be notified and/or engaged. Without this, the EPA is unable to issue General Terms of Approval ("GTA").

   GHD propose to develop a detailed assessment and evaluation of feasible and reasonable mitigation post-approval once the construction contractor has been engaged and has prepared their construction methodology.

   The EPA recommend that construction is limited to daytime hours (0700 – 1800 Monday to Friday, and 0700 to 1300 on Saturday) and that further information is provided, based on a reasonable worst-case construction scenario on the following to enable the EPA to develop GTA.

   - *The duration and extent of construction noise impact on each NCA and for each work phase*

GHD Pty Ltd ABN 39 008 488 373
Level 15 133 Castlereagh Street Sydney New South Wales 2000 Australia
T +61 2 9239 7100 **F** +61 2 9239 7199 **E** sydmail@ghd.com **W** www.ghd.com

- *Proposed mitigation measures to be applied to manage noise from each work phase*
- *An evaluation of the likely effectiveness of the proposed mitigation measures*
- *A description of procedures to manage any residual noise impacts, including community notification and engagement.*

In the absence of this information GTA cannot be prepared because there is insufficient information to determine likely duration and extent of impacts on the community, and whether the conceptual feasible and reasonable mitigation outlined in the GHD response will effectively manage construction noise impacts.

3 GHD response to EPA comments

3.1 GHD Response 1 (The duration and extent of construction noise impact on each NCA and for each work phase):

There are four main construction work areas, being the northern works, western works, the eastern works and the quarry works (see figures below). The exact duration for the works in each area is not yet known, however it can be estimated that the works in each area will be approximately 20 weeks in duration. The works in each area are likely to occur concurrently at some point throughout the project and as such, three worst-case scenarios were modelled in the NVIA report, being:

Scenario 1 – approximately 20 weeks in duration

- West: Excavation and rock breaking/ripping/crushing works
- Quarry: Rock ripping, filling works, screening and excavation

Scenario 2 – approximately 20 weeks in duration

- North: Excavation works
- Quarry: Excavation, Rock breaking/sawing/crushing, filling and screening
- East: Excavation and filling

Scenario 3 – approximately 20 weeks in duration

- West: Excavation and rock sawing
- Quarry: Filling
- East: Rock ripping/sawing/crushing, filling, excavation and screening

Based on this information, the NVIA provided conservative predictions of construction noise at receivers based on an indicative construction schedule of likely activities.

Once the contractor has been selected and the exact construction methodology and program have been determined, a Construction Noise Management Plan (CNMP) should be prepared to describe in further detail the methods that will be implemented for each construction work phase to minimise noise impacts.

The CNMP should identify any further noise modelling to be undertaken (if required), and should provide further detail for mitigation measures once all the required construction methodology information has

been received. The ICNG states the CNMP should be undertaken during the post-approval phase of the project and not during the pre-approval stage (limited information is available).

The exceedances above the NML for CS1B, CS2D and CS3D are shown graphically for all receivers in the study area in Figure 1, Figure 2 and Figure 3.

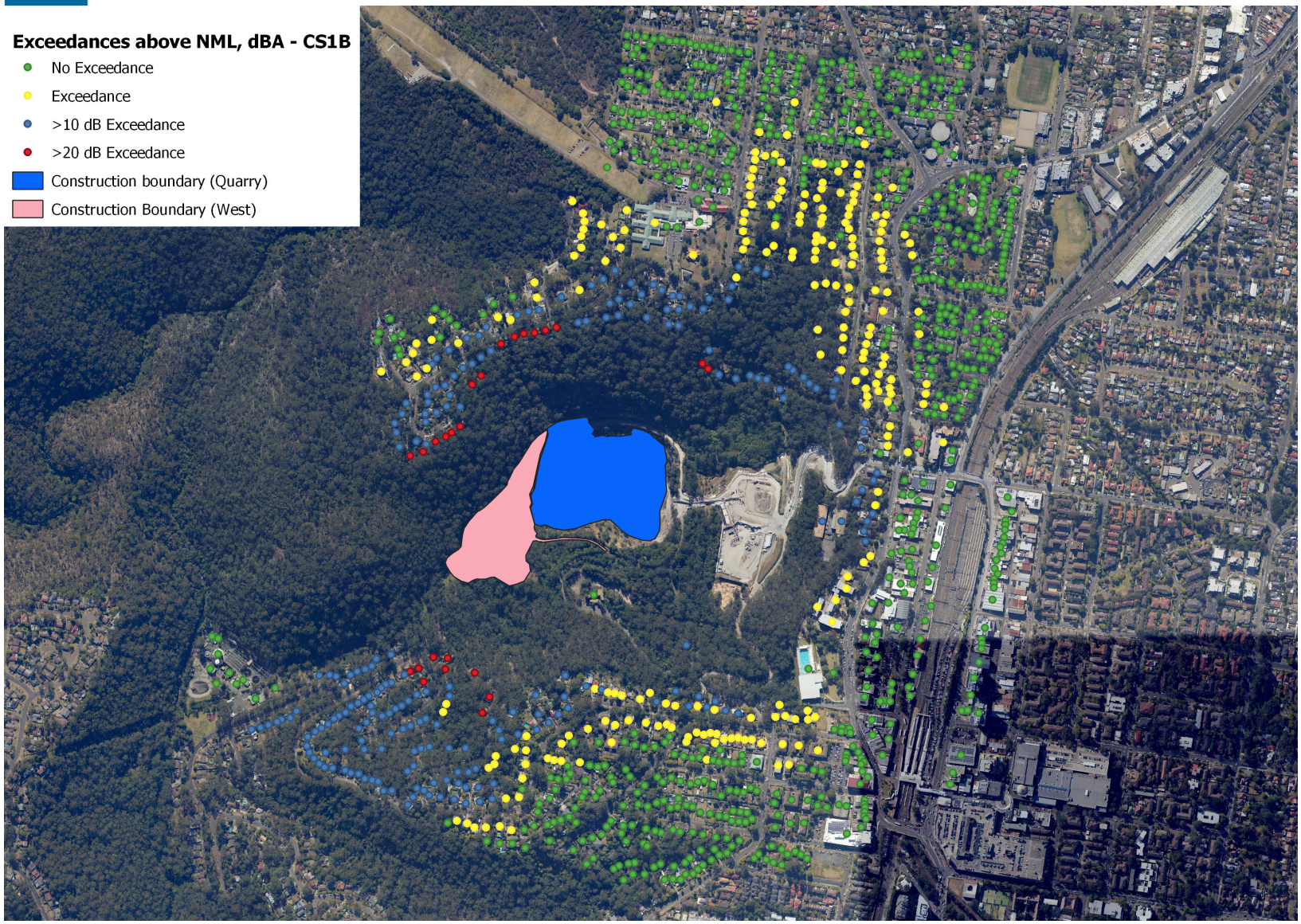


Figure 1- Exceedances above the NML, dBA – CS1B (includes rock-breaking works)

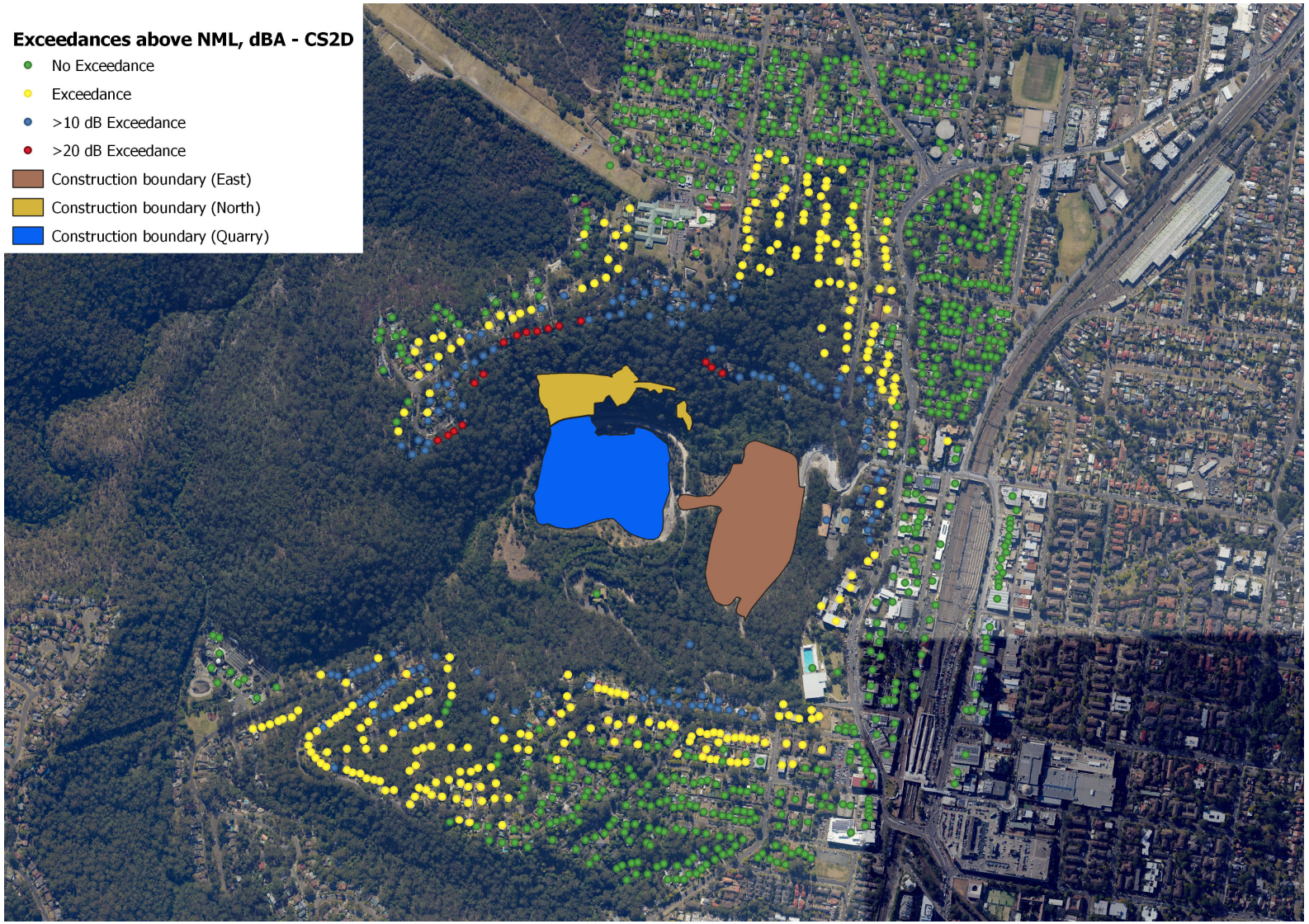


Figure 2- Exceedances above the NML, dBA – CS2D (includes rock-breaking works)

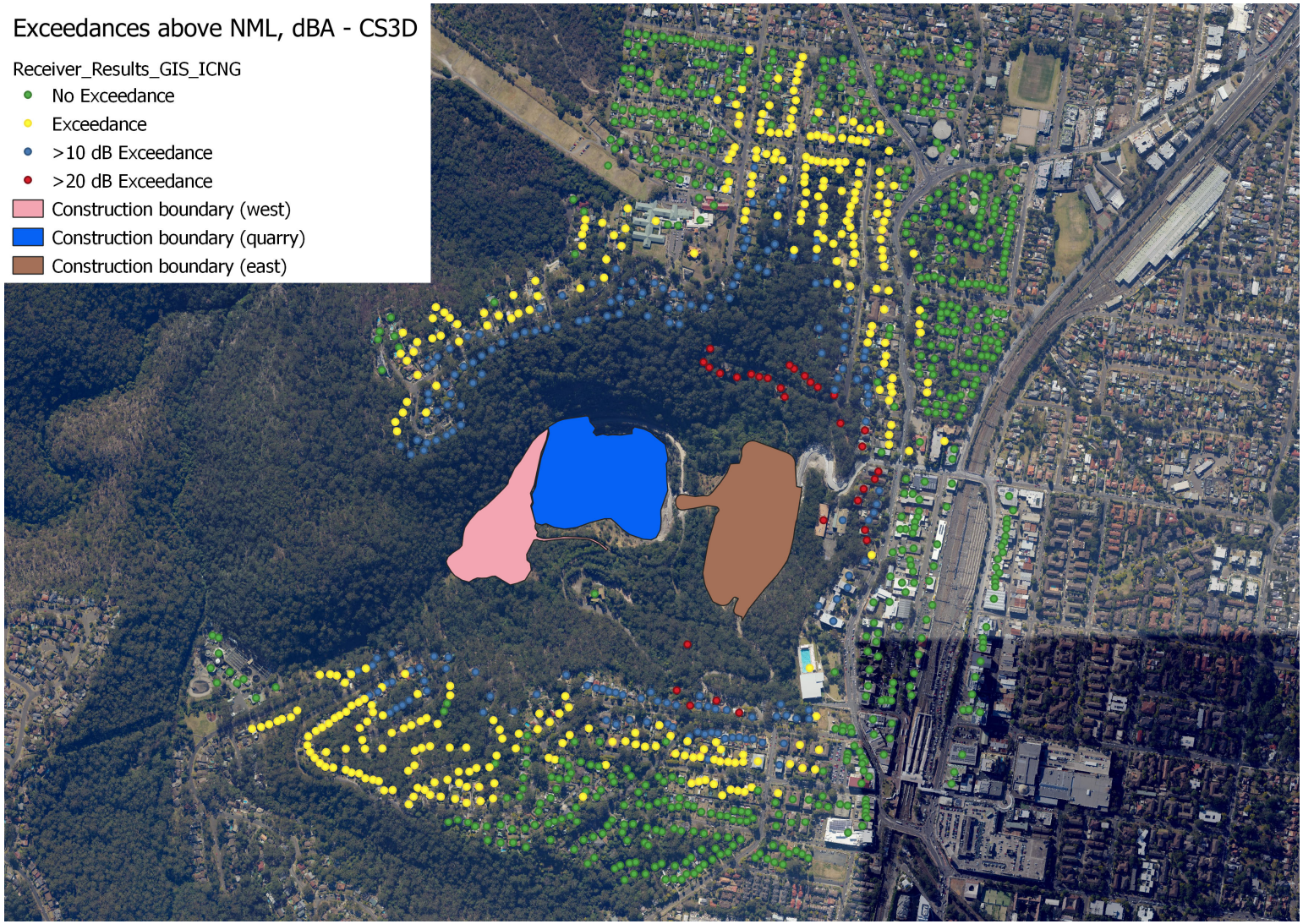


Figure 3- Exceedances above the NML, dBA – CS3D (includes rock-breaking works)

3.2 GHD Response 2 (Proposed mitigation measures to be applied to manage noise from each work phase)

The proposed mitigation measures to be applied have been re-evaluated and are presented in Table 1 below.

GHD Pty Ltd ABN 39 008 488 373
Level 15 133 Castlereagh Street Sydney New South Wales 2000 Australia
T +61 2 9239 7100 **F** +61 2 9239 7199 **E** sydmail@ghd.com **W** www.ghd.com

Table 1 – Proposed mitigation measures to be incorporated

Management measures to reduce construction noise and vibration impacts			
Action required	**Detail of the mitigation measure**	**Responsible party**	**Timing**
Implementation of any project specific mitigation measures required	Any project specific mitigation measures identified in the EIS documentation or approval or licence conditions must be implemented.	Contractor	Throughout project duration
Implement stakeholder consultation measures	Periodic notification (monthly letterbox drop and website notification) detailing all upcoming construction activities delivered to sensitive receivers at least 7 days prior to commencement of relevant works. In addition to Periodic Notification, the following strategies may be adopted on a case-by-case basis: • Project Specific Website • Project Infoline • Construction Response Line • Email Distribution List • Web-based Surveys • Social Media • Community and Stakeholder Meetings and • Community Based Forums (if required by approval conditions).	Contractor	Throughout project duration
Register of noise and vibration sensitive receivers	A register of most affected noise and vibration sensitive receivers (NVSRs) would be kept on site (receivers that have been identified as receiving noise levels greater than 20 dB above the noise	Contractor	Throughout project duration

	management leve). The register would include the following details for each NVSR: • Address of receiver • Category of receiver (e.g. Residential, Commercial etc.) • Contact name and phone number (if available) The register may be included as part of the Project's Community Liaison Plan or similar document and maintained in accordance with the requirements of this plan.		
Construction hours and scheduling	All activities on site should be confined between the hours: daytime hours of 7:00 am to 6:00 pm from Monday to Friday and 7:00 am to 1:00 pm on Saturday	Contractor	Throughout project duration
Construction respite period	Noise with special audible characteristics and vibration generating activities (including rock hammering, rock breaking and vibratory rolling) may only be carried out in continuous blocks, not exceeding 3 hours each, with a minimum respite period of one hour between each block. 'Continuous' includes any period during which there is less than a 1 hour respite between ceasing and recommencing any of the work.	Contractor	Throughout project duration
Site inductions	All employees, contractors and sub-contractors are to receive an environmental induction. The induction should include: – all relevant project specific and standard noise and vibration mitigation measures – relevant licence and approval conditions – permissible hours of work – any limitations on high noise generating activities – location of nearest sensitive receivers	Contractor	Prior to construction works and throughout project duration

	– construction employee parking areas – designated loading/ unloading areas and procedures – construction traffic routes – site opening/closing times (including deliveries) – environmental incident procedures – All personnel on site should be made aware of the potential for noise impacts and should aim to minimise impact or elevated noise levels, where possible. – Regular identification of noisy activities and adoption of improvement techniques		
Behavioural practices	No swearing or unnecessary shouting or loud stereos/radios on site. No dropping of materials from height, throwing of metal items and slamming of doors. No excessive revving of plant and vehicle engines. Controlled release of compressed air.	Contractor	Throughout project duration
Noise monitoring	A noise monitoring procedure and program should be carried out for the duration of works in accordance with the Construction Noise and Vibration Management Plan and any approval and licence conditions. Noise monitoring reports should be prepared in accordance with the requirements of the noise monitoring procedure.	Contractor	Throughout project duration
Update Construction Environmental Management Plans	The CEMP must be regularly updated to account for changes in noise and vibration management issues and strategies.	Contractor	Throughout project duration
Source mitigation measures			

Plan worksites and activities to minimise noise and vibration	Plan traffic flow, parking and loading/unloading areas to minimise reversing movements within the site.	Contractor / construction employees	Prior to construction works and throughout project duration
Construction vehicles traffic routes	Construction heavy vehicles utilising Dural Street and Quarry Road should be limited to one vehicle per hour during the night period	Contractor / construction employees	Throughout project duration
Equipment selection	Use quieter and less vibration emitting construction methods where feasible and reasonable	Contractor / construction employees	Prior to construction works and throughout project duration
Maximum noise levels	The noise levels of plant and equipment must have operating Sound Power equal or less than the levels stated in Table 5-1 of the Hornsby Quarry Rehabilitation EIS (NVIA Nov 2018)	Contractor	Prior to construction works and throughout project duration
Use and siting of plant	Simultaneous operation of noisy plant within discernible range of a sensitive receiver is to be avoided. The offset distance between noisy plant and adjacent sensitive receivers is to be maximised. Plant used intermittently to be throttled down or shut down. Noise-emitting plant to be directed away from sensitive receivers.	Contractor / construction employees	Throughout project duration
Non-tonal reversing alarms	Non-tonal reversing beepers (or an equivalent mechanism) must be fitted and used on all construction vehicles and mobile plant regularly used on site and for any out of hours work, including delivery vehicles.	Contractor	Throughout project duration

Construction Related Traffic	Schedule and route internal vehicle movements away from sensitive receivers and during less sensitive times. Limit the speed of vehicles and avoid the use of engine compression brakes.	Contractor / construction employees	Throughout project duration
Silencers on Mobile Plant	Where possible reduce noise from mobile plant through additional fittings including: Residential grade mufflers Damped hammers such as “City” Model Rammer Hammers Air Parking brake engagement is silenced.	Contractor / construction employees	Throughout project duration
Engine compression brake	Limit the use of engine compression brakes at night and in residential areas. Ensure vehicles are fitted with a maintained original equipment manufacturer exhaust silencer or a silencer that complies with the National Transport Commission’s ‘In-service test procedure’ and standard.	Contractor / construction employees	Throughout project duration
Transmission path mitigation measures			
Shield stationary noise sources such as pumps, compressors, fans etc	Stationary noise sources should be enclosed or shielded whilst ensuring that the occupational health and safety of workers is maintained.	Contractor / construction employees	Throughout project duration
Shield sensitive receivers from noisy activities	Use structures to shield residential receivers from noise such as site shed placement; earth bunds; fencing; erection of operational stage noise barriers (where practicable) and consideration of site topography when situating plant.	Contractor / construction employees	Prior to construction works and throughout project duration

3.3 GHD Response 3 (An evaluation of the likely effectiveness of the proposed mitigation measures)

Table 2 and Table 3 presents the likely effectiveness of the proposed mitigation measures at the source and in the transmission path.

Table 2 Relative effectiveness of various forms of noise control at the source

Control by	Nominal noise reduction possible (dBA)	Discussion of effectiveness	
		Mobile plant[1]	Stationary plant[2]
Distance	Approximately 6 for each doubling of distance	Very effective when implemented	Very effective when implemented
Screening	Normally 5 to 10 (maximum of 15)	Not generally possible and not effective, This is not recommended as most plant are mobile	The noise due to the project is dominated by mobile plant. Screening will likely have a negligible effect on noise levels at receivers.
Enclosure	Normally 15 to 25 (maximum 50)	Not generally possible and not effective for this project. This is not recommended as the majority of the noise plant are mobile.	The noise due to the project is dominated by mobile plant. Screening of stationary sources will likely have a negligible effect on noise levels at receivers.
Silencing / mufflers	Normally 5 to 10 (maximum 20)	Very effective when implemented – expected reduction of 10 dB. Not effective for rock breaking/ripping as the dominant noise source is from the impact of the attachment to the rock	N/A

1) Mobile plant refers to excavators (with attachments), dump trucks, bulldozers, mobile crushers, loaders, mobile screens, rollers/compactors, water cart, tub grinder and mulcher

2) Stationary plant refers to generators, A/C units, compressors, pumps etc.

Table 3 Relative effectiveness of various forms of noise control in the transmission path

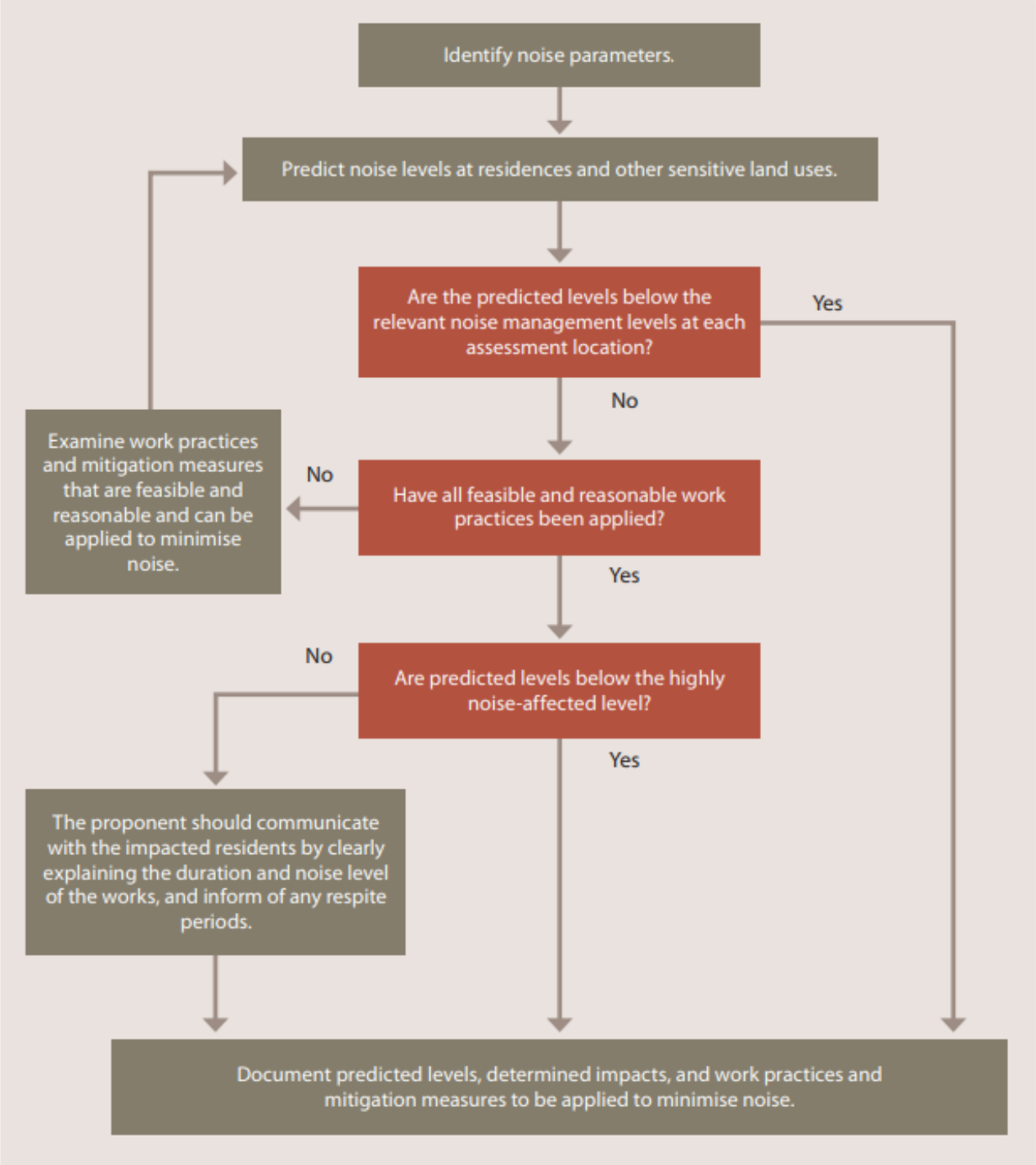
Control by	Nominal noise reduction possible (dBA)	Discussion of effectiveness	
		Mobile plant	Stationary plant
Shield stationary noise sources such as pumps,	Depends on the location of source and the receiver (normally 5 to 15)	N/A	Effective when it breaks the line of sight between the

Control by	Nominal noise reduction possible (dBA)	Discussion of effectiveness	
		Mobile plant	Stationary plant
compressors, fans etc.			source and receiver. Not effective if it doesn't.
Shield sensitive receivers from noisy activities	Depends on the location of source and the receiver (normally 5 to 15)	Effective when it breaks the line of sight between the source and receiver. Not effective if it doesn't.	Effective when it breaks the line of sight between the source and receiver. Not effective if it doesn't

3.4 GHD Response 4 (A description of procedures to manage any residual noise impacts, including community notification and engagement).

The assessment and management of residual noise impacts is a requirement of the Noise Policy for Industry and does not form part of the quantitative assessment procedure in the Interim Construction Noise Guideline. See the excerpt below from Section 4.6 of the ICNG.

Figure 1: Prediction and assessment of impacts – quantitative method



Subsequent to all the feasible and reasonable work practices being applied, the ICNG recommends that if the predicted levels are below the highly affected noise level, the proponent should

communicate with the impacts residents by clearly explaining the duration and noise level of the works, and inform of any respite periods. This has been proposed as presented in the management mitigation measures to reduce construction noise and vibration impacts (Table 1).

In lieu of any framework within the ICNG to assess and manage residual construction noise impacts, it is proposed that guidance be taken from Transport for NSW's Construction Noise Strategy as a suitable framework to manage additional noise mitigation measures.

These mitigation measures are dependent on how far the predicted construction noise levels are above the noise management level (NML). Note no receivers have been predicted to exceed the highly noise affected level of 75 dBA, however compliance monitoring would be required to confirm these levels. Reference can be made to Figure 1, Figure 2 and Figure 3 to determine the additional mitigation measures applicable for the receivers within the moderately intrusive and highly instructive ranges.

Table 4 Implementing additional noise management measures

Construction hours	Receiver perception	dB(A) above NML	Additional mitigation measures (refer to Table 6)
Standard hours	**Noticeable**	0	-
	Clearly audible	< 10	-
	Moderately intrusive	> 10 to 20	PN, V
	Highly intrusive	> 20	PN, V
	75 dBA or greater	N/A	PN, V, SN

Table 5 Details of the additional mitigation measures to be applied

Mitigation measure	Details of mitigation measure
Periodic notification (PN)	A notification entitled 'Project Update' or 'Construction Update' is produced and distributed to stakeholders via letterbox drop and distributed to the project postal and/or email mailing lists. Periodic notifications provide an overview of current and upcoming works across the project and other topics of interest. The objective is to engage, inform and provide project-specific messages. Advanced warning of potential disruptions (e.g. traffic changes or noisy works) can assist in reducing the impact on stakeholders. The approval conditions for projects specify requirements for notification to sensitive receivers where works may impact on them.

Verification monitoring (V)	Long-term verification monitoring of noise during construction should be conducted at a minimum of four affected receiver(s) surrounding the project area. Monitoring should provide alerts to the contractor when the highly noise affected level is exceeded (or a level agreed with the regulator). The purpose of monitoring is to confirm that: • construction noise and vibration from the project are consistent with the predictions in the noise assessment • mitigation and management of construction noise and vibration is appropriate for receivers affected by the works Where noise monitoring finds that the actual noise levels exceed those predicted in the noise assessment then immediate refinement of mitigation measures may be required and the CNVMP amended
Specific Notification (SN)	Specific notifications are in the form of a personalised letter or phone call to identified stakeholders no later than seven calendar days ahead of construction activities that are likely to exceed the noise objectives. Alternatively (or in addition to), communications representatives from the contractor would visit identified stakeholders at least 48 hours ahead of potentially disturbing construction activities and provide an individual briefing. • Letters may be letterbox dropped or hand distributed • Phone calls provide affected stakeholders with personalised contact and tailored advice, with the opportunity to provide comments on the proposed work and their specific needs • Individual briefings are used to inform stakeholders about the impacts of noisy activities and mitigation measures that will be implemented. Individual briefings provide affected stakeholders with personalised contact and tailored advice, with the opportunity to comment on the project

Please do not hesitate to contact the undersigned if you would like to discuss any of this further.

Sincerely
GHD

•

David Gamble
Technical Director - Waste Infrastructure
+61 2 9239 7354