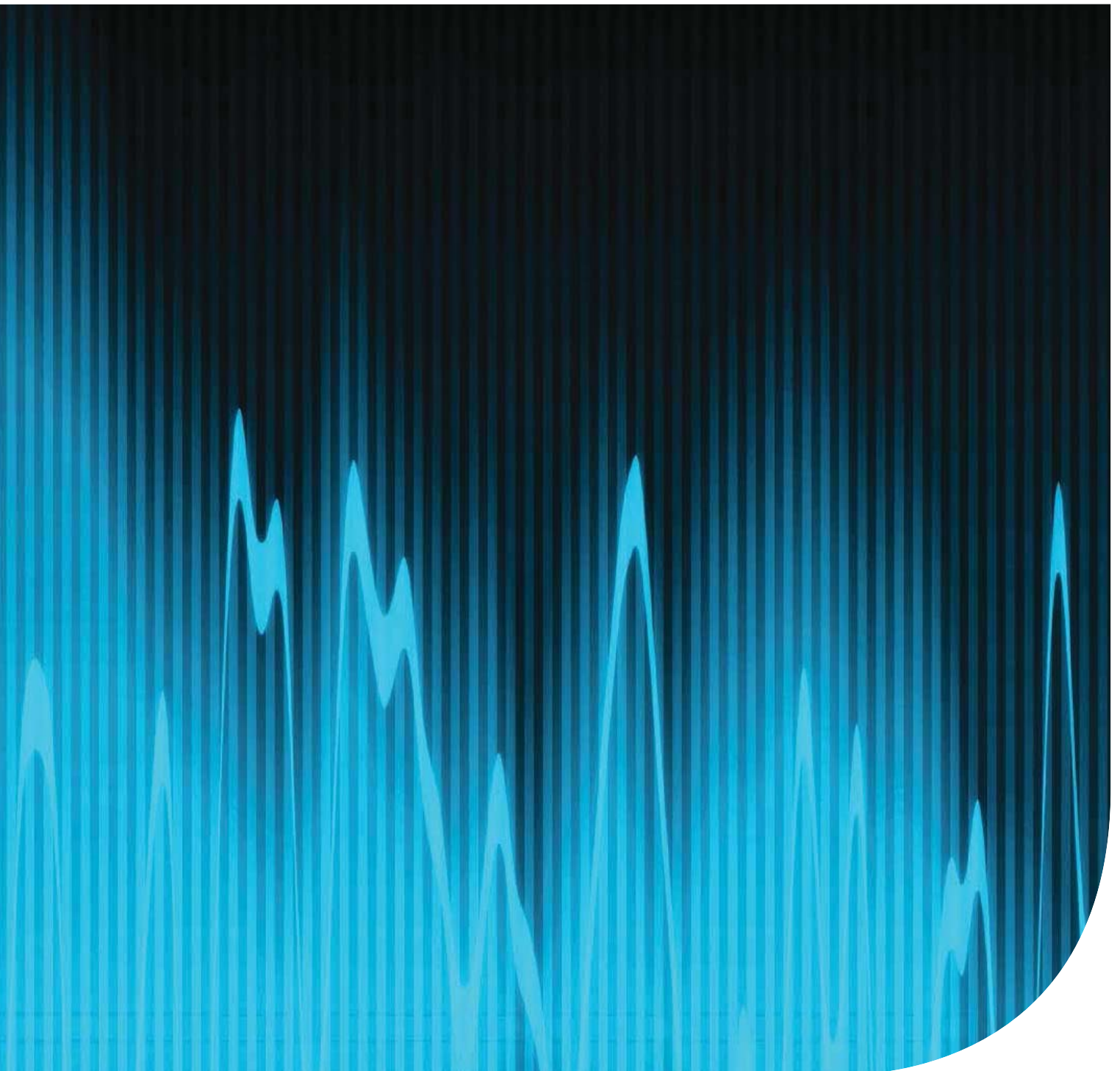


Moorebank Precinct West Stage 2

Noise and vibration independent review

Prepared for Department of Planning and Environment | 27 October 2017



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Ground Floor, Suite 01, 20 Chandos Street
St Leonards, NSW, 2065

T +61 2 9493 9500

F +61 2 9493 9599

E info@emmconsulting.com.au

www.emmconsulting.com.au

Moorebank Precinct West Stage 2

Final

Report J16215RP1 | Prepared for Department of Planning and Environment | 27 October 2017

Prepared/Approved by **Najah Ishac**

Position Director

Signature



Date 27 October 2017

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Document Control

Version	Date	Prepared by	Reviewed by
V1	17 September 2017	Najah Ishac	Katie Teyhan
V2	27 October 2017	Najah Ishac	Katie Teyhan



T +61 (0)2 9493 9500 | F +61 (0)2 9493 9599

Ground Floor | Suite 01 | 20 Chandos Street | St Leonards | New South Wales | 2065 | Australia

www.emmconsulting.com.au

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1 Introduction

EMM Consulting Pty Limited (EMM) has been engaged by the Department of Planning and Environment (the Department) to complete an independent review of the noise and vibration impact assessment (NVIA) for the Moorebank Precinct West (MPW) Stage 2 State Significant Development (SSD).

EMM's involvement has been generally limited to a desktop review of information, as well as meetings and other correspondence with the proponent and their consultant. Further, EMM has not completed independent modelling of impacts to verify outcomes.

EMM's scope of work includes:

- Impact assessment review:
 - review the noise and vibration impact assessment in the Modification Report / EIS and comment on the technical adequacy and completeness of the assessment. The methodology review shall take into account relevant noise and vibration impact assessment guidelines, requirements and legislation;
 - analysis of the results of the noise and vibration impact assessment, with reference to applicable legislation, guidelines and comparable projects;
 - review the appropriateness and effectiveness of management and mitigation measures recommended for the project, taking into account relevant guidelines, industry best practice and research or monitoring evidence (preferably published);
 - gaps analysis;
 - post-exhibition document review; and
- Impact assessment review report including draft recommended conditions that could be applied to avoid, minimise, mitigate, and/or manage the residual noise and vibration impacts (should approval of the project be recommended).

The following documents were reviewed as part of EMM's work:

- Noise Impact Assessment Sydney Intermodal Terminal Alliance (SIMTA), Wilkinson Murray Pty Limited, August 2013;
- Moorebank Intermodal Terminal Revised Project Report Noise and Vibration Impact Assessment prepared by SLR, 27 April 2015;
- MPW Concept Plan Modification, Noise and Vibration Impact Assessment prepared by Wilkinson Murray Pty Limited, June 2015;
- Moorebank Precinct West - Stage 2 Proposal, Environmental Impact Statement (EIS) – (SSD16-7709) prepared by Arcadis, October 2016;
- MPW Stage 2, Noise and vibration impact assessment prepared by Wilkinson Murray Pty Limited, October 2016 (EIS Appendix N);

- Development consent (SSD 6766) for Sydney Intermodal Terminal Alliance (SIMTA), Department of Planning, 12 December 2016;
- MPE Stage 2, Noise and vibration impact assessment prepared by Wilkinson Murray Pty Limited, December 2016;
- MPW Stage 2 – RtS Technical memo prepared by Wilkinson Murray Pty Limited, 16 March 2017;
- MPW Stage 2 – RtS Technical memo prepared by Wilkinson Murray Pty Limited, 24 March 2017;
- MPW Stage 2 – Response to submissions Addendum impact assessment – noise, prepared by Wilkinson Murray Pty Limited, March 2017;
- Moorebank Precinct West (MWP) Stage 2 (SSD 7709) Response to Submissions – Noise and Vibration, prepared by Arcadis, 27 April 2017;
- MPW Stage 2 – RtS Technical memo prepared by Wilkinson Murray Pty Limited, 25 May 2017;
- MPW Stage 2 Responses to Submissions addendum impact assessment – noise, prepared by Wilkinson Murray Pty Limited, May 2017;
- Moorebank Precinct West Stage 2 Proposal Response to Submissions Appendix K: Best Practice Review, prepared by Arcadis, June 2017;
- Moorebank Precinct West (MPW) Stage 2 (SSD 7709) Response to Submissions – issues raised by Transport for NSW, prepared by Arcadis, June 2017;
- Moorebank Precinct West - Stage 2 Proposal Response to Submissions – SSD 16_7709, prepared by Arcadis, July 2017; and
- EIS Website Submissions, available at <http://majorprojects.planning.nsw.gov.au>.

Appendix A provides a glossary of acoustic terms used in this report.

2 The proposed project

SIMTA are seeking approval under Part 4, Division 4.1 of the EP&A Act for the construction and operation of an intermodal terminal (IMT) facility, a rail link connection and associated warehousing, in accordance with the MPW Concept Approval (SSD 5066).

The key features of the project include:

- IMT facility, including:
 - infrastructure to support a container freight throughput volume of 500,000 twenty-foot equivalent units (TEUs) per annum;
 - installation of nine rail sidings and associated locomotive shifter;
 - truck processing, holding and loading areas;
 - container storage area serviced by manual handling equipment;
 - container wash-down facilities and de-gassing area; and
 - administration facility, engineer's workshop and associated car parking.
- Rail link connection:
 - construction of the rail link connection, which links the sidings within the IMT facility to the rail link (which would be constructed as part of the MPE Project (SSD 14-6766)); and
 - the operation of the rail link connection and the rail link (from the rail link connection to the Southern Sydney Freight Line (SSFL)).
- Warehousing area – construction of 215,000m² Gross Floor Area (GFA) of warehousing, with warehouses ranging in size from 21,000m² to 61,000m². Included within the warehousing area would be ancillary offices, truck and light vehicle parking, associated warehouse access roads.
- Freight village – construction and operation of approximately 800m² of retail premises, with access from the internal road.
- Upgraded intersection on Moorebank Avenue, which would provide site access and egress.
- Ancillary works – including vegetation clearing, earth works (including the importation of 1,600,000m³ fill), utilities installation/connection, signage and landscaping.

The Proposal would operate 24 hours a day, seven days a week. Refer to Appendix B for the footprint and operational layout of the Proposal.

The IMT facility and rail link connection would operate 24 hours per day and seven days per week. The warehouses would be operational for 24 hours a day, and seven days a week and the operational hours of the freight village would be 7am to 6pm, seven days per week.

Refer to Appendix B for a general arrangement plan of the facility and precinct.

3 Methodology review

3.1 Existing noise environment and assessment locations

3.1.1 Surrounding environment

The noise environment surrounding the site is characterised by the local road network, including Moorebank Avenue, the South Western Motorway and other transport infrastructure such as the Main Southern Railway Line and the East Hills Railway Line. Commercial and industrial areas around the site along Moorebank Avenue and Anzac Road would also contribute to the local noise environment. The site is located adjacent bushland area and the Georges River to the west and residential receivers exist in the suburbs of Casula, Glenfield and Wattle Grove to the west, south west and east of the site respectively.

3.1.2 Adopted representative monitoring locations

The EIS NVIA report relies upon three monitoring locations as representative of baseline conditions at all potentially exposed properties within predefined catchment areas around the site being Casula, Glenfield and Wattle Grove. This monitoring data is sourced from previous studies by SLR Consulting part of the MPW Concept Plan EIS. Additional monitoring locations were included in the MPW Concept Plan EIS but not adopted for this study. All such data has been considered in this review.

The noise assessment adopted three broad assessment areas surrounding the site as described above being Casula, Glenfield and Wattle Grove. The monitoring and assessment locations are shown in Figure 5.1 of the NVIA report which has been reproduced in Appendix B herein (Figure B.2).

3.1.3 Noise assessment areas

The use of only one monitoring location for each of the relatively broad residential areas is identified as a limitation to the noise impact assessment. Normal practice is to include enough sampling spread across such large geographic areas to adequately represent the potentially most impacted locations.

The proponent's response to submissions includes an undertaking to continue ambient noise monitoring surveys within Casula, Wattle Grove and Glenfield.

This issue can be addressed through the draft recommendation conditions (eg to guide this further monitoring), should the DP&E grant approval.

3.2 Ambient and background noise monitoring

Baseline noise monitoring was completed as part the NVIA primarily to obtain rating background levels (RBLs) for setting noise criteria to assess proposed construction works and operational activities. Additionally, rail specific monitoring was completed subsequent to baseline sampling at specific and targeted locations.

For RBL determination, the INP recommends collection of seven days of 'valid' data at locations representative of the most exposed sensitive receivers to the proposal. This generally means data unaffected by rain or winds in excess of 5 m/s, with data exclusion rules applying as described in Appendix B of the INP.

It is important to monitor weather conditions during any baseline noise surveys and the INP recommends, for example, monitoring wind speed at the microphone position for the purposes of applying the data exclusion rules and calculation of final representative noise levels. It is common practice to adopt nearby weather stations operated by the Bureau of Meteorology (BoM) for such purposes, so long as these can be shown to be representative of the area where noise monitoring occurred.

3.2.1 Data review

Review of the noise monitoring data provided in the MPW Concept Plan EIS shows sampling satisfied the INP requirements for the locations used in the current study.

3.3 Rail traffic noise monitoring

Subsequent to the EIS NVIA, attended noise monitoring of rail operations on the Southern Sydney Freight Line (SSFL) was completed at three locations. This approach is good practice and provides site specific data useful for calibrating models and for assessment of future impacts.

4 Assessment criteria

The EIS noise and vibration report references appropriate guidelines, policies and standards including most of those nominated in the Secretary's Environmental Assessment Requirements (SEARs) for the project. The guidelines, policies and standards adopted are:

- NSW Industrial Noise Policy (INP), Environment Protection Authority (EPA), 2000;
- Noise Guide for Local Government (NGLG) (EPA, 2013);
- NSW Road Noise Policy (RNP), Department of Environment, Climate Change and Water (DECCW), 2011;
- Rail Infrastructure Noise Guideline (RING) (EPA, 2013);
- Interim Construction Noise Guideline (ICNG), Department of Environment and Climate Change (DECC), 2009; and
- Assessing vibration: a technical guideline (AVATG), NSW Department of Environment and Conservation (DEC), 2006.

The guideline from the SEARs that is not referenced is the Rail Corridors and Busy Roads Interim Guideline (DoP 2008). However, the consequences of this are not material to this project.

4.1 NSW EPA Industrial Noise Policy (INP)

The INP was applied to calculate background noise levels from monitoring data collected at the three adopted logger locations. Details on this process however were not provided, eg weather exclusion rules and final quantity of data remaining following such data exclusion. This information is however available from a related study and appropriate steps appear to have been followed in this respect.

The INP amenity criteria have been appropriately established for the areas assessed.

As discussed earlier, the geographical gap in baseline sampling remains an issue, however in the RtS the proponent includes continued monitoring in all three areas of Casula, Wattle Grove and Glenfield. The draft recommended conditions, should the DP&E grant approval, can be used to address this issue through a requirement for additional monitoring, for example.

4.2 Sleep disturbance screening levels

These have been appropriately established for the sampling locations adopted.

4.3 Road Noise Policy (RNP)

The establishment of road noise criteria for the assessment of project related traffic was appropriately determined using the RNP.

However, the referenced traffic noise criteria only address residential properties. The assessment should also include non-residential uses as listed in the Road Noise Policy (RNP), including educational facilities, places of worship and others as relevant.

This issue can be addressed through the draft recommendation conditions, should the DP&E grant approval.

4.4 Rail noise criteria

The establishment of rail noise criteria for the assessment of project related traffic on the non-network section of track was appropriately determined using the Rail Infrastructure Noise Guideline (RING).

The assessment of operations on the SSFL was not completed in accordance with the RING.

4.5 DECC Interim Construction Noise Guideline (ICNG)

The standard hours noise management levels (NMLs) were developed in accordance with the ICNG for the monitoring locations adopted. These are considered representative for the nominated locations. As discussed earlier, sampling was done to cover relatively large areas and hence adopting one monitoring location for such an area could lead to unrepresentative NMLs for this area.

However, the NMLs developed for out of hours (OOH) period 1 (ie 6am to 7am) did not adopt the NSW EPA's recommended approach whereby the midway RBL (between night and day levels) and therefore midway NML would apply. This would yield a marginal reduction in NMLs for the OOH period 1 assessment at all three adopted residential areas. The NMLs should therefore be 41dB, 39dB and 39dB for Casula, Glenfield and Wattle Grove respectively. However, assuming the predicted construction noise levels presented later in the report are representative, such changes in NMLs are inconsequential to the assessment of impacts.

This issue can be addressed through the draft recommendation conditions, should the DP&E grant approval (eg by requiring development of a construction noise and vibration management plan that includes additional sampling or by requiring on the spot sampling at additional locations during compliance monitoring).

4.6 Assessing vibration: a technical guideline (AVATG)

The AVATG was appropriately adopted for the purposes of human comfort vibration (annoyance based criteria) potentially caused by the project.

5 Noise Impact Assessment

5.1 Operational noise

A recognised computer noise model was adopted for the study. However, details on noise sources modelled were not provided in any mapping and this makes it difficult for the reader to comprehend the scale and placement of various noise producing activities. Clarification on this was sort in the gaps analysis. Similarly, clarification on the weather conditions adopted for the modelling was also requested and subsequently provided.

A key element of the operations is the movement of trucks on site and their distribution across a 24 hour period. The adopted operational sound power levels for trucking activities are considered representative. It is clear that this will be the main source of noise from the proposal, and specifically trucking along the main thoroughfare proposed along the western perimeter of the site. This thoroughfare is outside the areas where the proposed warehousing buildings would offer protection to the closest residences. To abate this main source of noise, a noise barrier is proposed to be constructed along the trucking route to protect off site land uses in Casula. The noise barrier alignment is shown on Figure 7.1 of the NVIA report (refer to Appendix B herein). The barrier appears to be approximately 1.4km in length and 5m high. The barrier design includes a 300mm gap beneath it to allow for storm water runoff. This gap in the barrier is a serious concern and was raised in discussions with the proponent. However, it was confirmed that the modelling has allowed for such a gap and noise predictions reflect this as depicted in noise contour plots provided in the NVIA.

Other sources of noise of note include on site rail operations and reach stackers used to transfer containers to and from rail wagons. The adopted sound power levels for locomotive noise are considered representative, although that for reach stackers and the locomotive shifter have not been substantiated and should be given the specialist nature of such equipment. The source of such data for the proposed reach stackers and locomotive shifter should be provided, including whether based on measurement data or manufacturer information.

5.1.1 Assessment of impacts

The assessment of impacts for Glenfield and Wattle Grove residential areas indicate impacts are unlikely and well within the NSW EPA's noise policy criteria. However, a reported 1dB exceedance is shown for residences of Casula at night time during assessable adverse weather conditions. This exceedance is notwithstanding the proposed 5m high noise barrier, which appears to be the only mitigation measure considered and adopted for the project. Consideration of all feasible and reasonable mitigation must be demonstrated if marginal exceedance of the NSW EPA's INP is to be permitted. This has not been demonstrated and therefore the INP based Project Specific Noise Levels (PSNL) should be adopted. To that end, there exists ambiguity in the Response to Submissions documents (Wilkinson Murray May 2017 page 10) as to the changes in predicted noise levels between the EIS NVIA and the amended proposal. At Section 1.3.2 Results, it is stated that

...at the most affected residential receivers in Casula, under the Amended Proposal, LAeq,15min and LAeq,period operational noise levels decrease by 1 dB during the daytime and evening, and LAeq,period operational noise levels increase by 1 dB during the night time.

However, the tabulated results for $L_{Aeq,period}$ noise for Casula at night according to Table 1-6 of the aforementioned Wilkinson Murray report do not increase, but rather decrease by 1dB for the amended proposal. This ambiguity should be clarified and otherwise is suggestive of unreliable results.

This issue can be addressed through the draft recommended conditions, should the DP&E grant approval.

5.1.2 Cumulative versus combined noise

The proponent's documentation concedes that from the community's perspective the project (MPW Stage 2) will be viewed as one operation together with MPW Stage 1 and MPE (Stage 1 and Stage 2). Operational noise assessment should therefore consider such an approach. There are precedents in the mining industry for example where this 'whole of complex' approach is adopted which simplifies administration of the site for the proponent and regulator, while also providing added noise benefits to the community. This should and can be readily tested by combining the operational noise predictions presented for all four projects as relevant (eg MPW Stage 1 does not include an operational component).

In reality though, it is considered more likely that noise sensitive locations (ie residences) would be exposed to more noise from one side of Moorebank Avenue than the other (ie either MPW or MPE). Hence, the 'whole of complex' approach to noise assessment should not result in additional limitations on the facilities in general. Exceptions may be locations to the north and south where some contribution from both MPW and MPE could influence received noise.

This issue can be addressed through the draft recommended conditions, should the DP&E grant approval.

5.2 Rail noise

There are a number of aspects to rail noise that should be considered in the assessment. These being operations on the non-network rail line (servicing the industrial development), network rail noise and also the consideration of rail squeal on relatively tight track curvatures as proposed on the rail spur.

The approach adopted includes the assessment of the non-network rail line as per the Rail Infrastructure Noise Guideline (RING). However, the assessment of SSFL including operations of the proposal and associated changes in noise was not completed in accordance with the RING.

The assessment of the non-network rail line or spur that is proposed to service the industrial development shows exceedance of the RING recommended noise levels. Importantly, this assessment ignores rail squeal, which based on the curvature proposed appears likely. Best practice mitigation and management of such must be applied to achieve the appropriate outcome for the community.

This issue can be addressed through the draft recommended conditions, should the DP&E grant approval. Importantly, the conditions of consent for the approved MPE Stage 1 will provide a basis for the subject project.

An assessment of the operations on the SSFL has not been completed on the basis that an intermodal facility in the Moorebank area was accounted for when the SSFL was approved. This approach is not considered good practice and an assessment with updated volumes as now known for the proposal should be completed in accordance with the RING. This should include measured existing noise levels on the SSFL (as facilitated through monitoring completed to date), expected volumes and related noise in the future with and without the proposal to demonstrate adherence with the RING. Notwithstanding this shortfall in the assessment, the broader issue of network rail line noise is the jurisdiction of the Australian Rail Track Corporation (ARTC) and should be addressed by that organisation.

5.3 Road traffic noise

The predicted changes to road traffic noise appear to have been prepared using accepted practices and shows marginal increases of between 0.1 to 0.3 dB on the immediate road network and the M5 Motorway. These increases are considered negligible and within the RNP allowable increase of 2dB where all feasible and reasonable mitigation and management measures have been considered.

5.4 Construction noise and vibration

The adopted construction scenarios, equipment and corresponding noise emission values are considered appropriate and consistent with similar projects. The proposed construction period extends over approximately three years and is therefore potentially a significant burden on the community.

Importantly, construction activities are proposed generally during standard hours, although some out-of-hours (OOH) works are also expected (eg fill importation). The OOH periods include a morning shoulder of 6am to 7am, weekday evenings of 6pm to 10pm, Saturday morning shoulder of 7am to 8am and Saturday afternoon of 1pm to 6pm. Importantly, the EPA defined night time period (10pm to 7am) is largely free of construction works.

The quoted sound power level used in the modelling should be substantiated, although appear representative of the plant identified based on similar projects.

As for operational noise, the modelling of construction noise impacts adopted commercially available and recognised suitable software (CadnaA). Details on precise location of modelled sources is not readily identifiable but it is stated that worst case positions were used to develop predictions for surrounding properties and hence plant were placed at various locations within the broader site area to achieve this outcome.

It is unclear if adverse or neutral weather conditions were adopted for construction modelling scenarios. Inference is drawn from the operational modelling, where daytime predictions were presented for neutral weather and night time predictions were completed for adverse weather conditions.

The proposal is not representative of typical construction sites since it is expected to extend over a three year period. Noise impacts will be higher than those presented for the standard hours when adverse weather conditions prevail, eg source to receiver winds. Notwithstanding this, the predictions indicate adherence with noise criteria at most locations and for most of the proposed activities. Allowing for some enhancement due to adverse weather during standard hours, impacts are not expected to be significant at most locations. The 1 dB exceedance shown for the residences of Casula however will be exacerbated during adverse weather. Hence, feasible and reasonable mitigation and management measures should be adopted during the noisiest activities (eg bulk earthworks, drainage and utilities).

It is not clear whether the ICNG penalties have been applied to predictions for annoying characteristics such as that associated with excavators with breakers. Nonetheless, routine compliance monitoring as per any developed Construction Noise and Vibration Management Plan (CNVMP) will be used to confirm actual received noise levels, inclusive of noise characteristic considerations.

This issue can be addressed through the draft recommended conditions, should the DP&E grant approval.

5.5 Construction vibration

A detailed assessment of potential vibration from construction for specific receivers has not been completed. The NVIA only provides safe working distances for typical vibration intensive plant. This is not uncommon practice for the EIS stage of a project and further consideration must be given to this issue by the contractor during design stages of the project. However, given the separation distances between site and sensitive off site receivers (eg residences), vibration impacts from construction are considered unlikely.

5.6 Cumulative construction noise

The assessment identifies at least two other construction activities that could potentially overlap with construction of the proposal. These being the MPW Early Works and MPE Stage 1 construction.

The cumulative construction noise assessment shows that the 1dB exceedance predicted for Casula residences from the proposal would be exacerbated due to cumulative construction works (primarily due to MPW Early Works) such that a 2dB exceedance would occur during standard hours.

No information relating to out of hours works is provided for cumulative construction noise.

This issue can be addressed through the draft recommended conditions, should the DP&E grant approval.

5.7 Noise and vibration mitigation

As described previously, the key mitigation measure for operation of the proposal is the noise barrier along the western boundary of the site to protect Casula residences from on site trucking activities. Notwithstanding this barrier, an exceedance of 1dB is predicted at Casula residences.

Rail operations on the non network or rail spur proposed to service the site is said to be managed in the same way as the MPE Stage 1 proposal and the associated conditions of consent. These conditions pertain to issues of rail squeal and include the requirement for a monitoring system.

The NVIA defers any detailed measures to the development of a construction noise and vibration management plan (CNVMP). This is not uncommon practice, and given the level of impacts identified (or lack thereof) this is considered to be an acceptable approach.

The NVIA report provides at Table 11-1 a list of Revised Environmental Management Measures (REMMs). These are considered standard practice or typical measures, and although some are aimed at specific site activities, there are no commitments to any project specific mitigation in this section of the report. However, Section 22 of the EIS does commit to several noise mitigation or management measures. All such measures will be considered for adoption as conditions, should DP&E grant approval.

6 Gaps analysis

The following sections provide a gaps analysis (prepared and provided to the proponent in December 2016) of the NVIA report in the EIS. A response to the gaps analysis has been provided by the proponent and is shown in Appendix C of this report, together with final review comments by EMM.

1. provide ambient noise monitoring data charts and/or raw electronic data from locations L1 to L3 as referenced from the MPW Concept Plan EIS (precise reference not provided and seemingly no longer available online);
2. provide separate site plan showing each of the seven construction stages' equipment placements used in the model, relative to surrounding land-uses;
3. as for item 2, provide same for operational noise sources (eg route for trucks on site for day, evening and night scenarios, and position of all major noise sources such as the reach stackers, other container handling equipment and locomotives);
4. clarify meteorological conditions used in modelling for the night time period (see section 7.1.2 of the noise impact assessment (NIA));
5. clarify representation of locomotives on site as referenced at Section 7.2.2 of the NIA that states "...a combined SWL of 111dBA,...". Confirming if this is for the eight modelled locomotives on site or per locomotive;
6. confirm rail track curvature radii between the site and SSFL connection (eg provide a 2-D alignment map to scale or in digital format that can be used to measure radii);
7. Section 8.2.2 implies that existing rail traffic noise is significant and that the additional movements are not significant in terms of volumes when compared to existing. An analysis of existing rail noise levels at the three residential areas should be provided and the expected change in rail noise due to the Proposal demonstrated to "unlikely to noticeably increase due to the Proposal". For example, the reference to 77 Leacocks Lane and Lot 21 Leacocks Lane noise levels is unclear (stated as 3 to 5 dB increase because of the relative shielding to the track for these two locations). It is unclear if this issue is limited to this location or a small number of properties or if this issue extends across many properties;
8. confirm whether it will be an average of eight locomotives (as per Section 7.2.2) or seven trains (as per Section 8.2.3) per day at the site. Confirm what the typical and maximum train movements will be to/from site across the daytime and night time periods, and provide an assessment of these;
9. confirm what, if any, feasible and reasonable mitigation or management was considered to abate noise level exceedances identified in Section 8 due to train movements, or justify why these would not be adopted;
10. existing road traffic noise levels should be provided in addition to the quote increases in Section 9;
11. confirm no cumulative construction noise is expected during out of hours periods or provide an assessment of such as per the standard hours cumulative assessment at Section 10.4 of the NIA;

12. provide confirmation on why the SEARs item 6 f) was not addressed in full in respect of the listed guidelines ie DoP 2008 and EPA's vibration guideline. Alternatively, provide a detail vibration impact assessment from proposed construction activities to demonstrate vibration impacts are not likely as stated (eg provide offset distances from typical plant and activities and compare these to actual separation distances to sensitive receivers including residences and other structures); and
13. confirm which mitigation measures listed in Table 11-1 would be adopted for the Proposal.

7 Post exhibition review

The government agencies, organisations and public submissions on the EIS as provided on the DP&E website (<http://majorprojects.planning.nsw.gov.au/>) were reviewed as was the proponent's responses to these.

7.1 Government agencies

7.1.1 Environment Protection Authority (EPA)

The EPA raised a number of noise and vibration issues in its submission. The broad areas raised were construction noise including on-site crushing and concrete batch plant, out of hours construction works, construction noise and management plan; operational noise including best practice, locomotives, rail noise, sleep disturbance, modelling, detailed design needs, and cumulative noise impacts.

The EPA submission is considered to be adequately addressed in the proponent's responses. This includes adoption of feasible and reasonable mitigation or management, consideration of best practices and development of noise management plans (CNVMP and ONMP) to form part of the overall environment management plans.

7.1.2 Office of Environment and Heritage

No issues relating to noise and vibration were raised.

7.1.3 NSW Department of Primary Industries

No issues relating to noise and vibration were raised.

7.1.4 TfNSW, RMS and Sydney Trains

TfNSW and RMS provided a joint submission to the Department with regard to the four State Significant Development Applications currently relevant to the Moorebank Precinct East and MPW. In this submission, no specific comments were provided in relation to noise or vibration however concerns were raised with regard to traffic routes and volumes generated by the construction and operational phases of the Proposal which may have implications to the road traffic noise assessment.

If traffic routes and/or volumes change there will be a need to reassess project-related road traffic noise levels or justification provided as to why they would not need to be reassessed.

TfNSW also provided a submission specific to MPW Stage 2. Sub-reference 11 of this submission recommends a condition in relation to the rail operational noise on the rail link.

The proponent's responses to the issues raised by this submission have been partly addressed. Further consideration of such issues will and can be addressed through the draft recommended conditions, should the DP&E grant approval.

7.2 Liverpool City Council

Liverpool City Council's (LCC's) submission includes a peer review by Cardno Pty Ltd and includes a number of noise and vibration items. LCC's covering letter considers impacts on human health during both construction and operations are likely to be greater than identified in the EIS due to the traffic assumptions used.

The attachment to LCC's submission raises issues on the rail link noise, construction noise criteria, noise model inputs, noise model outputs, consistency with concept approval and provides recommendations.

The LCC's submission is considered to be addressed in the proponent's EIS and responses in the most part. Some of the sub-issues raised regarding the consistency with the concept approval and the provided recommendations were not fully addressed.

This issue can be addressed through the draft recommendation conditions, should the DP&E grant approval.

7.3 Campbelltown City Council

No issues relating to noise and vibration were raised.

7.4 Moorebank Heritage Group Inc.

A recommendation is submitted that

...the noise and vibration impacts associated with construction and operational activities are specifically assessed for Kitchener House.

This issue is considered to be addressed appropriately by the proponent's responses.

7.5 Community groups

7.5.1 Liverpool Action Group

Noise was mentioned in this submission; however, no specific issues relating to noise and vibration were provided.

7.5.2 Ryde-Hunters Hill Flora and Fauna preservation society

The submission includes a reference to noise measures for development near rail corridors and busy roads, requests a map for noise pollution and noise control via co-locating the two developments of MPE and MPW.

This issue is considered to be addressed appropriately by the EIS and the proponent's responses.

7.6 Community submissions

Most of the objectors to the project listed online include reference to noise. The reference to noise is typically only general in nature and without specific details. However, a number of objectors did provide specific references to noise and these included onsite trucking noise, container lifting equipment, train shunting, rail squeal, increases in noise from existing levels, reversing alarms, horns, pneumatic braking, lack of mitigation measures, cost of mitigation measures, forklifts and trucks 24/7, banging of containers 24/7, trucks on the street, train noise, combined total noise with existing sources, shift workers and daytime noise, sleep disturbance and increased traffic noise.

These submissions are considered to be adequately addressed in the proponent's EIS and responses as described earlier through responses to other submissions.

8 Amended project review

The key changes identified in the amended project since the EIS that could alter noise include construction of the upgraded layout for the Moorebank Avenue/ Anzac Road intersection and operational noise changes from the proposed container wash-down and degassing facility (eg large pressure washer) and the adjustments to warehouse layout.

Based on the revised assessments it is found that operational noise at offsite assessment locations is relatively unchanged from that presented in the EIS. For example, the key finding reported in the EIS of a 1dB exceedance at Casula residences remains the same.

The construction noise profile does however change significantly for Wattle Grove residences as compared to the EIS predictions. The amended project construction noise does however remain within noise management level criteria.

9 Draft recommended conditions

9.1 Construction hours

1. Construction activities shall be undertaken during the following standard construction hours:
 - a) 7:00am to 6:00pm Mondays to Fridays, inclusive;
 - b) 8:00am to 1:00pm Saturdays; and
 - c) at no time on Sundays or public holidays.
2. Except as permitted by an EPL, activities resulting in high noise impact (including impulsive or tonal noise emissions) shall only be undertaken:
 - a) between the hours of 8:00 am to 5:00 pm Monday to Friday;
 - b) between the hours of 8:00 am to 1:00 pm Saturday; and
 - c) in continuous blocks not exceeding three hours each with a minimum respite from those activities and works of not less than one hour between each block.

For the purposes of this condition, 'continuous' includes any period during which there is less than a one hour respite between ceasing and recommencing any of the work that is the subject of this condition.

3. Notwithstanding the above conditions, construction works may be undertaken outside the hours specified in the following circumstances:
 - a) where they can be shown to be inaudible at residences and vibration levels do not exceed those stipulated by Table 2.2 and Table 2.4 of Assessing Vibration: a technical guideline (DEC, 2006);
 - b) where noise can be shown to satisfy the noise management levels specified in the Interim Construction Noise Guideline (DECC, 2009) at non-residential landuses;
 - c) where a negotiated agreement has been arranged with affected receivers;
 - d) for the delivery of materials required by the police or other authorities for safety reasons;
 - e) where it is required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm;
 - f) construction works approved through an Environment Protection Licence (including an approved Out-Of-Hours Work Protocol prepared as part of the Construction Noise and Vibration Management Plan). The protocol must include notification of the relevant Council, local residents and other affected stakeholders and sensitive receivers of the timing and duration at least 48 hours prior to the commencement of the works; and
 - g) identified works approved by the Secretary.

9.2 Construction noise and vibration impact assessment criteria

The Proponent shall implement all reasonable and feasible noise mitigation measures with the aim of achieving the following construction noise management levels and vibration criteria:

- h) construction noise management levels established using the Interim Construction Noise Guideline (DECC 2009);
- i) vibration criteria established using the Assessing Vibration: a Technical Guide (DECC 2006) (for human exposure); and
- j) the vibration limits set out in the German Standard DIN 4150-3: Structural Vibration effects of vibration on structures (for structural damage).

Any construction activities identified as exceeding the construction noise management levels and/or vibration criteria shall be managed in accordance with the Construction Noise and Vibration Management Plan. All feasible and reasonable noise mitigation and management measures shall be implemented and any activities that could exceed the construction noise management levels shall be identified and managed in accordance with the Construction Noise and Vibration Management Plan.

Note: The Interim Construction Noise Guideline identifies ‘particularly annoying’ activities that require the addition of 5dB(A) to the predicted level before comparing to the construction NML.

9.3 Construction traffic noise

- 4. Construction traffic movements on public roads shall aim to limit any increase in existing road traffic noise levels to no more than 2 dB $L_{Aeq,period}$, where ‘period’ is defined in the EPA’s Road Noise Policy (RNP) for both day and night. All feasible and reasonable noise mitigation and management measures shall be implemented to achieve this limit.
- 5. The Proponent is to ensure that construction vehicle contractors operate so as to minimise impacts. Measures that could be used include toolbox talks, contracts that include provisions to deal with unsatisfactory noise performance for the vehicle and/or the operator, and specifying non-tonal movement alarms in place of reversing beepers or alternatives such as reversing cameras and proximity alarms, or a combination of these, where tonal alarms are not mandated by legislation.
- 6. No use of compression brakes for construction vehicles associated with the project that are on site or on nearby roads (eg Anzac Road).

9.4 Construction Noise and Vibration Management Plan (CNVMP)

- 7. A Construction Noise and Vibration Management Plan must be developed and detail how construction noise and vibration impacts will be minimised and managed. The Plan shall be consistent with the guidelines contained in the Interim Construction Noise Guidelines (Department of Environment and Climate Change 2009). The plan shall be developed in consultation with the EPA and shall include, but not be limited to:
 - i) identification of the work areas, site compounds and access points;

- ii) identification of sensitive receivers (including heritage structures if relevant) and relevant construction noise and vibration goals applicable to the project and stipulated in the conditions above;
- iii) details of construction activities and an indicative schedule for construction works, including the identification of key noise and/or vibration generating construction activities (based on representative construction scenarios) that have the potential to generate noise and/or vibration impacts on surrounding sensitive receivers, particularly residential areas;
- iv) an Out-of-hours Work Protocol for the assessment, management and approval of works outside standard construction hours as defined in the conditions herein, for the Secretary's approval. The Out-of-hours Work Protocol must detail:
 - a) assessment of out-of-hours works against the relevant noise and vibration criteria;
 - b) detailed mitigation measures for any residual impacts (that is, additional to general mitigation measures), including extent of at-receiver treatments; and
 - c) proposed notification arrangements.
- v) identification of feasible and reasonable measures proposed to be implemented to minimise and manage construction noise impacts, including, but not limited to, acoustic enclosures, erection of noise walls (hoardings), respite periods;
- vi) management of the number of trucks accessing the site to the maximum identified in the Environmental Assessment and subsequent documentation;
- vii) a truck driver protocol addressing designated routes, acceptable delivery hours, speed limits on site, no engine braking in the vicinity or on site, no extended periods of engine idling, avoid queuing in or around the site and limit needs for reversing on site;
- viii) identification of feasible and reasonable procedures and mitigation measures to ensure relevant vibration criteria are achieved, including applicable buffer distances for vibration intensive works, use of low vibration generating equipment/ vibration dampeners or alternative construction methodology, and pre- and post- construction dilapidation surveys of sensitive structures where vibration is likely to result in damage to buildings and structures (including surveys being undertaken immediately following a monitored exceedance of the criteria);
- ix) a description of how the effectiveness of mitigation and management measures would be monitored during the proposed works, clearly indicating how often this monitoring would be conducted, the locations where monitoring would take place, how the results of this monitoring would be recorded and reported, and, if any exceedance is detected, how any noncompliance would be rectified;
- x) noise and vibration monitoring procedures (routine and complaints triggered monitoring);
- xi) a community consultation and complaints handling procedure; and

- xii) mechanisms for the monitoring, review and amendment of this plan.

9.5 Blasting

- 8. Blasting is not permitted on the site.

9.6 Operational noise and vibration

9.6.1 Review of operational sleep disturbance impacts

- 9. The proponent shall prepare a review of sleep disturbance impacts based on detailed design, including:
 - a) an assessment of how often noise events occur, the time of day they occur and whether there are any times of day when there is a clear change in noise the environment;
 - b) confirm the operational L_{Amax} predictions of the final design; and
 - c) consider appropriate noise mitigation measures where required.

The report shall be prepared in consultation with the EPA and be submitted to the satisfaction of the Secretary within six months of commencement of construction, unless otherwise agreed by the Secretary.

9.6.2 Operational noise and vibration

- 10. Port shuttle operations must use:
 - a) Locomotives that incorporate available best practice noise and emission technologies. Prior to the construction of the rail link connecting to the site, the proponent must submit a report to the Secretary for consideration and approval that has been prepared in consultation with TfNSW and the EPA that justifies the technology proposed and how it meets the objective of best practice noise and emission technologies; and
 - b) Wagons that incorporate available best practice noise technologies including as a minimum, permanently coupled 'multi-pack' steering wagons using Electronically Controlled Pneumatic (ECP) braking with a wire based distributed power system (or better practice technology). Prior to the commencement of operation, the proponent must submit a report to the Secretary for consideration and approval that has been prepared in consultation with TfNSW and the EPA that justifies the technology proposed and how it meets the objective of best practice noise technologies.
- 11. The proponent shall install and maintain a rail noise monitoring system on the rail link at the commencement of operation to continuously monitor the noise from rail operations on the rail link. The system shall capture the noise from each individual train passby noise generation event, and include information to identify:
 - a) Time and date of freight train passbys;
 - b) Imagery or video to enable identification of the rolling stock during day and night;
 - c) $L_{Aeq(15hour)}$ and $L_{Aeq(9hour)}$ from rail operations; and

- d) $L_{AF(max)}$ and SEL of individual train passbys, measured in accordance with ISO3095; or
 - e) Other alternative information as agreed with, or required by, the Secretary.
12. The results from the noise monitoring system shall be publicly accessible from a website maintained by the proponent. The noise results from each train shall be available on the website within 24 hours of it passing the monitor, unless unforeseen circumstances (i.e a system malfunction) have occurred. The $L_{Aeq(15hour)}$ and $L_{Aeq(9hr)}$ results from each day shall be available on the website within 24 hours of the period ending.
 13. Prior to the commencement of operation, the proponent shall submit for the approval of the Secretary, justification supporting the appropriateness of the location for rail noise monitoring, including details of any alternative options considered and reasons for these being dismissed. The rail noise monitoring system shall not operate until the Secretary has approved the proposed monitoring location.
 14. The proponent shall provide an annual report to the Secretary with the results of monitoring for a period of 5 years, or as otherwise agreed with the Secretary, from the commencement of operation. The Secretary shall consider the need for further reporting following a review of the results for year 5.
 15. The following measures must be implemented during operation:
 - a) The use of automatic rail lubrication equipment in accordance with ASA Standard T HR TR 00111 ST Rail Lubrication and top of rail friction modifiers, where required; and
 - b) Measures to ensure the rail cross sectional profile is maintained in accordance with ETN-01-02 Rail Grinding Manual for Plain Track to ensure the correct wheel / rail contact position and hence to encourage proper rolling stock steering.
 16. The transfer of containers between Port Botany and the IMEX terminal must not commence until the rail connection to the SSFL is operational.
 17. Containers must be transferred from Port Botany to the site and from the site to Port Botany by rail, unless there is planned track maintenance or where unforeseen circumstances have occurred (eg an incident, breakdown, derailment or emergency maintenance on the rail line). The Secretary may at any time request the proponent to demonstrate that the transport of containers between the site and Port Botany container terminals is by rail. This is to be demonstrated upon request by the Secretary for the prior 12 month period.
 18. The proponent shall prepare a six-monthly report to the Secretary with the results of container and vehicle monitoring for a period of 3 years, or as otherwise agreed with the Secretary, from the commencement of operation of the IMEX terminal. The Secretary shall consider the need for further reporting following a review of the results for year 3. The report shall include:
 - a) The number of twenty foot equivalent units dispatched and received during the period;
 - b) A record of heavy vehicle entry by date and approximate time; and
 - c) The number of light vehicles turning left into the terminal site from Moorebank Avenue and turning right from the terminal site onto Moorebank Avenue for a representative day.

19. Heavy road freight vehicles are not permitted to use Moorebank Avenue south of the East Hills Railway corridor. A main gate monitoring system (eg CCTV) shall be installed to identify heavy vehicles turning right from the terminal site onto Moorebank Avenue, or turning left from Moorebank Avenue to the terminal site. The Secretary may at any time request the proponent to provide a heavy vehicle monitoring report for the prior 12 month period.
20. Within 12 months of the commencement of operation of the project, or as otherwise agreed by the Secretary, the proponent shall undertake operational noise monitoring to compare actual noise performance of the project against noise performance predicted in the review of noise mitigation measures predicted in documents specified under conditions of this approval, and prepare an Operational Noise Report to document this monitoring. The Report shall include, but not necessarily be limited to:
 - a) noise monitoring to assess compliance with the operational noise levels predicted in documents specified under conditions of this approval;
 - b) a review of the operational noise levels in terms of criteria and noise goals established in the NSW Road Noise Policy (EPA, 2011);
 - c) sleep disturbance impacts compared to those determined in documents referenced in conditions of this approval;
 - d) methodology, location and frequency of noise monitoring undertaken, including monitoring sites at which project noise levels are ascertained, with specific reference to locations indicative of impacts on sensitive receivers;
 - e) details of any complaints and enquiries received in relation to operational noise generated by the project between the date of commencement of operation and the date the report was prepared;
 - f) any required recalibrations of the noise model taking into consideration factors such as actual traffic numbers and proportions;
 - g) an assessment of the performance and effectiveness of applied noise mitigation measures together with a review and if necessary, reassessment of all feasible and reasonable mitigation measures; and
 - h) identification of additional feasible and reasonable measures to those predicted in the documents specified under conditions of this approval, that would be implemented with the objective of meeting the criteria outlined in the NSW Road Noise Policy (EPA, 2011), when these measures would be implemented and how their effectiveness would be measured and reported to the Secretary and the EPA.
21. The proponent shall provide the Secretary and the EPA with a copy of the Operational Noise Report within 60 days of completing the operational noise monitoring referred to in (a) above or as otherwise agreed by the Secretary.
22. To ensure the operational noise impacts are appropriately managed, the following measures apply:
 - a) Best practice plant for both the IMEX and interstate terminal, including electronic automated container handling equipment or equipment with equivalent sound power levels;

- b) A noise barrier on the western side of the haul road consistent with the Environmental Assessment and subsequent documents as relevant; and
 - c) A risk assessment to determine if non-tonal reversing alarms can be fitted as a condition of site entry. Alternatively, site design may include traffic flow that does not require or precludes reversing of vehicles.
23. Prior to the commencement of operation, the proponent shall prepare a report to identify:
- a) The extent of wheel squeal across the fleet of rail vehicles that will frequently use the terminals. This should identify the number of occurrences of brake squeal, the typical noise levels associated with brake squeal (including the frequency content), and the operational conditions under which brake squeal occurs (e.g. under light braking, hard braking, low / medium / high speed, effects of temperature and weather, etc.);
 - b) The root cause of brake squeal, including the influence of the design, set-up and maintenance of both brake shoes and brake rigging;
 - c) Possible solutions to mitigate or eliminate brake squeal, including modifications to brake rigging and alternative brake shoe designs and compounds; and
 - d) Any monitoring system proposed to capture brake squeal.
24. Detail how the expected port shuttle locomotives incorporate available best practice technologies.
25. The Proponent shall ensure that the noise generated by the overall precinct operations (defined as all activities within the MPW site boundary, together with MPE Stage 1 and Stage 2 areas as shown in Appendix B figures herein) does not exceed the noise impact assessment criteria below at any residence on privately-owned land:
- a) Casula - 39 dB $L_{Aeq,15\text{minute}}$ for the day, evening and night time periods and 45 dB $L_{A1,1\text{minute}}$ during the night;
 - b) Glenfield - 35 dB $L_{Aeq,15\text{minute}}$ for the day, evening and night time periods and 45 dB $L_{A1,1\text{minute}}$ during the night; and
 - c) Wattle Grove - 36 dB $L_{Aeq,15\text{minute}}$ for the day, evening and night time periods and 45 dB $L_{A1,1\text{minute}}$ during the night.

Notes:

To determine compliance with the $L_{Aeq,15\text{ minute}}$ noise limits, noise from the project is to be measured at the most affected point within the residential boundary, or at the most affected point within 30 metres of a dwelling where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct measurement of noise from the project is impractical, the EPA may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.

To determine compliance with the $L_{A1,1 \text{ minute}}$ noise limits, noise from the project is to be measured at 1 metre from the dwelling façade. Where it can be demonstrated that direct measurement of noise from the project is impractical, the EPA may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).

The noise emission limits identified above apply under meteorological conditions of:

- (i) wind speeds of up to 3 m/s at 10 metres above ground level; or
- (ii) 'F' atmospheric stability class.

Continuous improvement

26. The Proponent shall:

- a) continue to implement all reasonable and feasible best practice noise mitigation measures;
- b) continue to investigate ways to reduce the noise generated by the project, including maximum noise levels which may result in sleep disturbance; and
- c) report on these investigations and the implementation and effectiveness of these measures in the Annual Review to the satisfaction of the Director-General.

Appendix A

Glossary of acoustic terms

A number of technical acoustic descriptions are used in this report. A list of terms and a brief explanation are provided in Table A.1.

Table A.1 **Glossary of acoustic terms**

Abbreviation or term	Description
ABL	The assessment background level (ABL) is defined in the INP as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured L90 statistical noise levels.
Amenity criteria	The amenity criteria relate to all industrial noise. Where industrial noise approaches base amenity criteria, then noise levels from new industries need to demonstrate that they will not be an additional contributor to existing industrial noise.
ANZECC	Australian and New Zealand Environment Conservation Council
CNMP	Construction noise management plan
Day period ¹	Monday to Saturday: 7.00 am to 6.00 pm, on Sundays and public holidays: 8.00 am to 6.00 pm.
dB	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
DGRs	Director-General's environmental assessment requirements
DP&E	Department of Planning and Environment (NSW government)
EPA	NSW Environment Protection Authority
EP&A Act	Environmental and Planning Assessment Act 1979 (NSW)
Evening period ¹	Monday to Saturday: 6.00 pm to 10.00 pm, on Sundays and public holidays: 6.00 pm to 10.00 pm.
ICNG	Interim Construction Noise Guideline
INP	Industrial Noise Policy (NSW EPA 2000)
Intrusive criteria	The intrusive criteria refers to noise that intrudes above the background level by more than 5 dB. The intrusiveness criterion is described in detail in this report.
L _{A1}	The A-weighted noise level exceeded for 1% of the time.
L _{A10}	The A-weighted noise level which is exceeded 10% of the time. It is roughly equivalent to the average of maximum noise level.
L _{A90}	The A-weighted noise level that is exceeded 90% of the time. Commonly referred to as the background noise level.
L _{Aeq}	The energy average, A-weighted noise from a source. This is the equivalent continuous sound pressure level over a given period. The L _{Aeq(15min)} descriptor refers to an L _{Aeq} noise level measured over a 15-minute period.
Linear peak	The peak level of an event is normally measured using a microphone in the same manner as linear noise (ie unweighted), at frequencies both in and below the audible range.
L _{Amax}	The maximum A-weighted sound pressure level received during a measuring interval.
Night period ¹	Monday to Saturday: 10.00 pm to 7.00 am, on Sundays and public holidays: 10.00 pm to 8.00 am.
NMP	Noise management plan
PSNL	The project-specific noise level (PSNL) are criteria for a particular industrial noise source or industry. The PSNL is the lower of either the intrusive criteria or amenity criteria.
RBL	The rating background level (RBL) is an overall single value background level representing each assessment period over the whole monitoring period. The RBL is used to determine the intrusiveness criteria for noise assessment purposes and is the median of the average background levels.
RNP	Road Noise Policy
RING	Rail Infrastructure Noise Guideline
Sound power level (L _w)	A measure of the total power radiated by a source. The sound power of a source is a fundamental property of the source and is independent of the surrounding environment.

Table A.1 **Glossary of acoustic terms**

Abbreviation or term	Description
Temperature inversion	A meteorological condition where the atmospheric temperature increases with altitude.
Vibration	A motion that can be measured in terms of its displacement, velocity or acceleration. The common unit for velocity is millimetres per second (mm/s).

Note: 1. excludes road traffic noise where Day: 07.00 am to 10.00 pm; Night: 10.00 pm to 07.00 am.

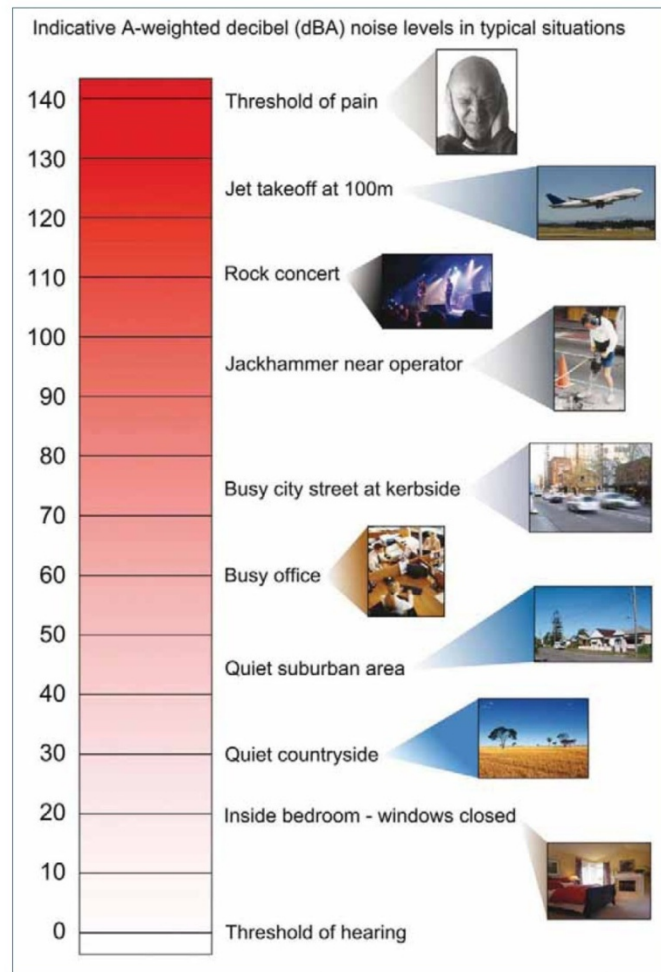
A.1 Common noise levels

It is useful to have an appreciation of dB, the unit of sound measurement when reading this assessment. Table A.2 gives some practical indication of what an average person perceives about changes in noise levels.

Table A.2 **Perceived change in noise**

Change in sound level (dB)	Perceived change in noise
up to 2	generally not perceptible
3	just perceptible
5	noticeable difference
10	twice (or half) as loud
15	large change
20	four times as loud (or quarter) as loud

Examples of common noise levels are provided in Figure A.1.



Source: RTA Environmental Noise Management Manual (RTA 2001)

Figure A.1 Common noise levels

Appendix B

Project and Noise and vibration report graphics

The following section provides copies of figures from various sources as follows:

- Proposal overview (Source: MPW Stage 2 RTS Appendix O – Consolidated project description, Arcadis, June 2017)
- Sensitive receptors and noise monitoring locations (Source: NVIA, Wilkinson Murray Pty Ltd, October 2016)
- Noise wall and buildings included in noise model (Source: Figure 7.1 of the EIS NVIA report)
- MPW Intermodal Terminal Facility - Stage 2 General Arrangement Plan (as supplied by the proponent to DP&E)
- Moorebank Intermodal Overall Precinct General Arrangement Plan (as supplied by the proponent to DP&E)

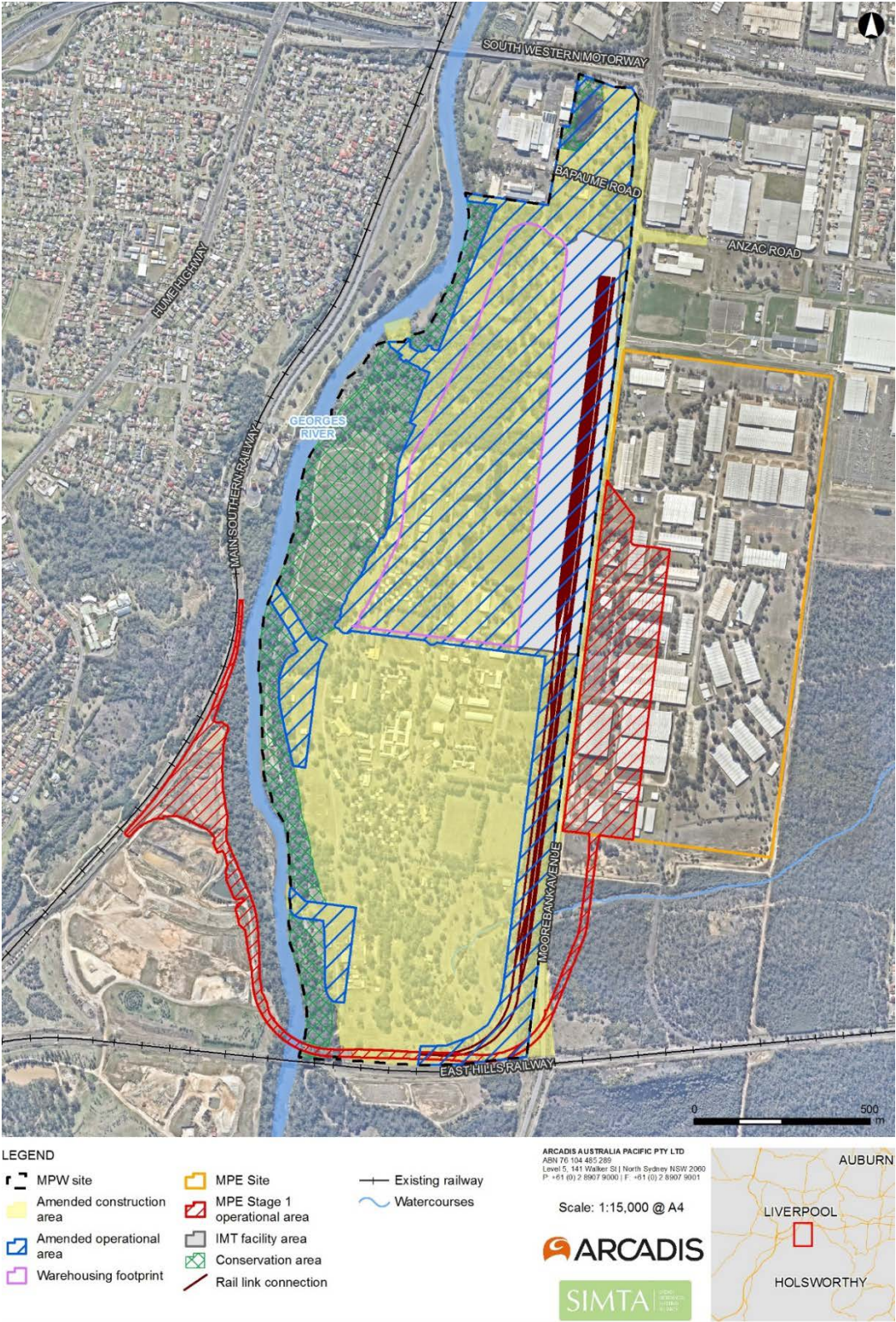
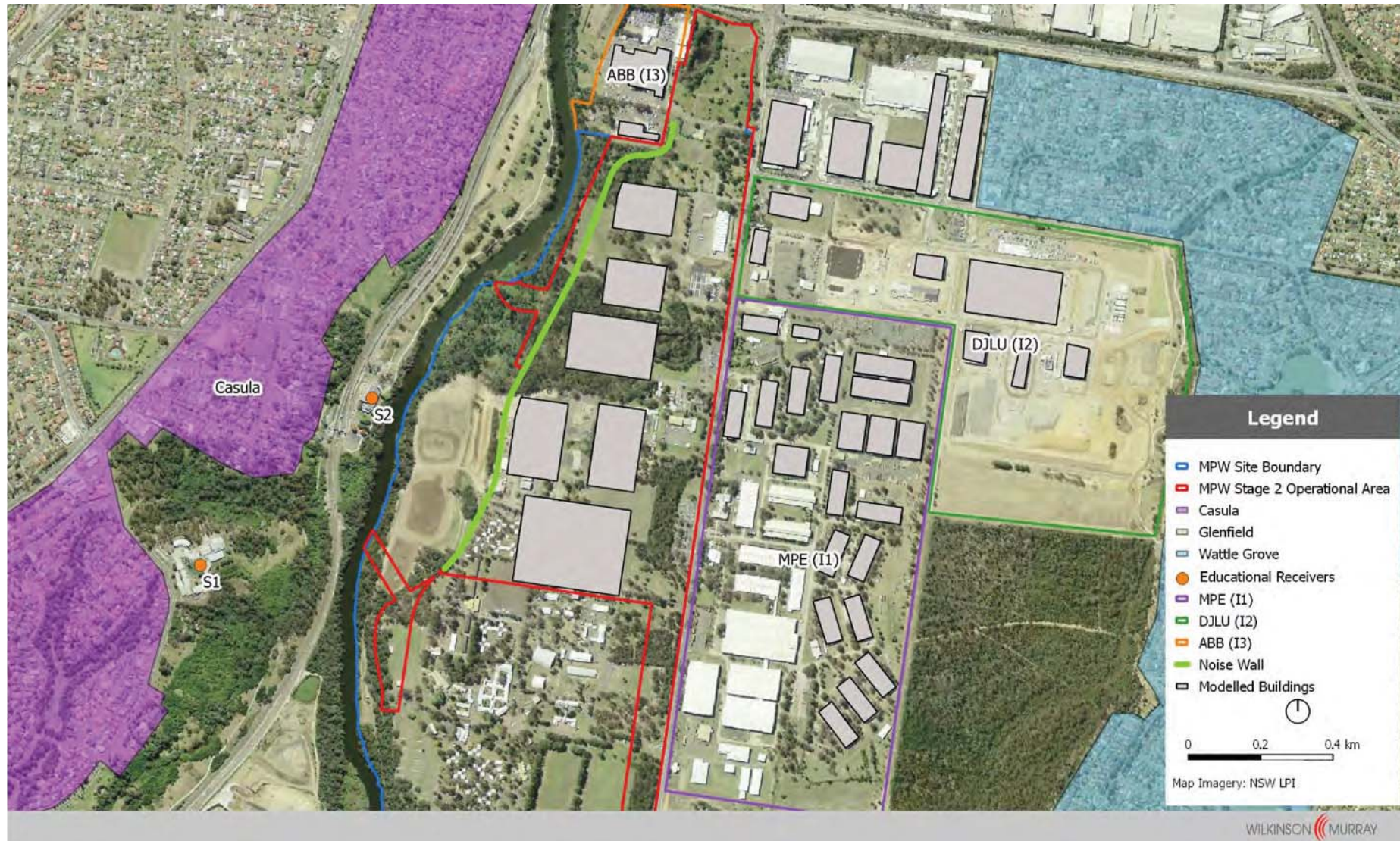


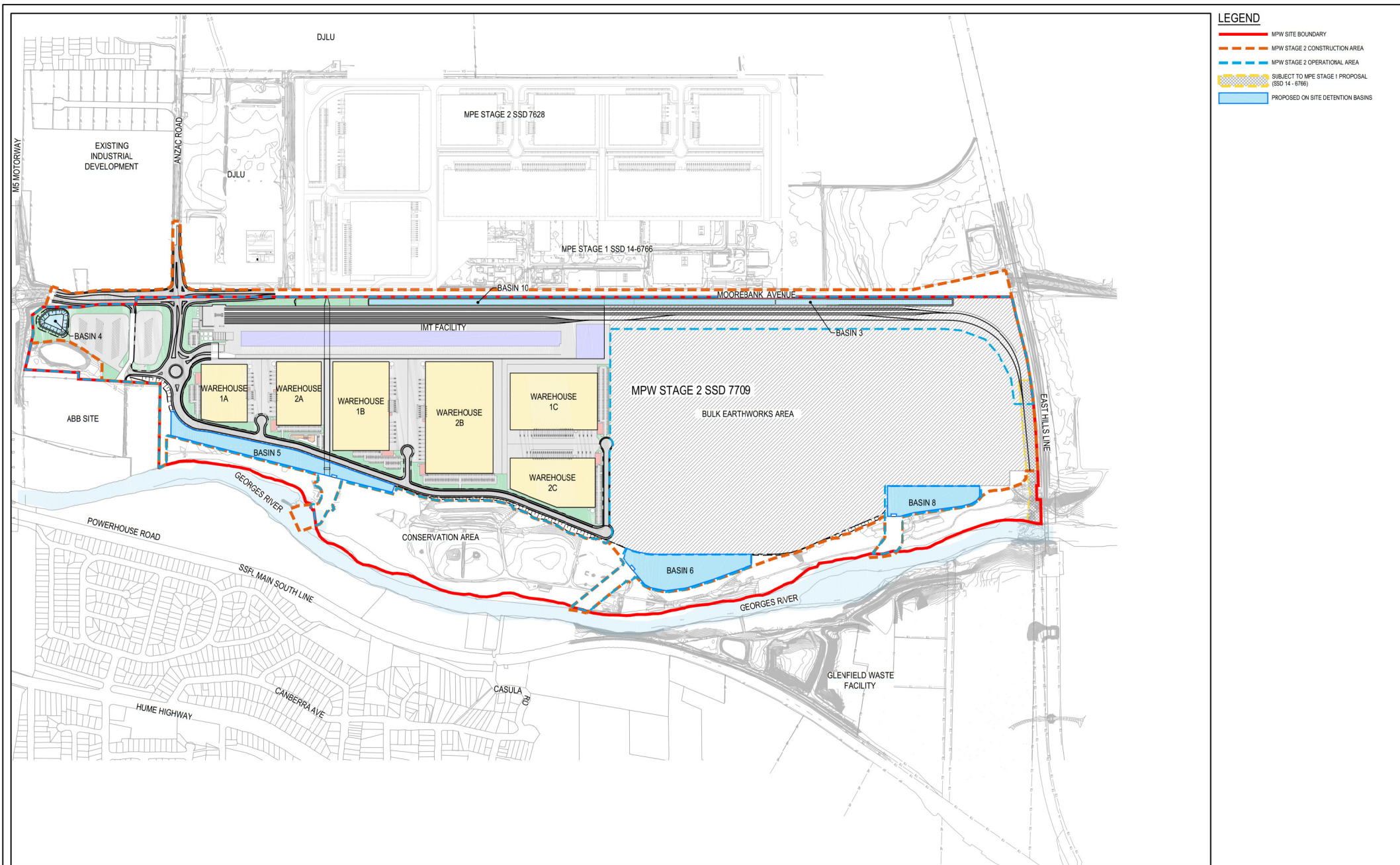
Figure 4-1: Proposal overview

Figure 5-1 Sensitive Receivers and Noise Monitoring Locations

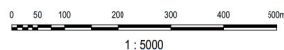


Figure 7-1 Noise Wall and Buildings included in Noise Model





Issue		Date
#1	ISSUE FOR INFORMATION	19/09/2017
Description		



Client

SIMTA SYDNEY INTERMODAL TERMINAL ALLIANCE

TACTICAL GROUP

FOR INFORMATION	
INDICATIVE / CONCEPT AND SUBJECT TO CONFIRMATION DURING DETAILED DESIGN	
Scales	
1 : 5000	Current Issue Signatures
Original Size	Drawn
Height	Designed
Datum	Checked
Grid	Approved
Filename:	SKC-mic2-025-GeneralArrangementPlan.dwg

Project

MPW INTERMODAL TERMINAL FACILITY - STAGE 2

STATE SIGNIFICANT DEVELOPMENT APPLICATION

Title

GENERAL ARRANGEMENT PLAN

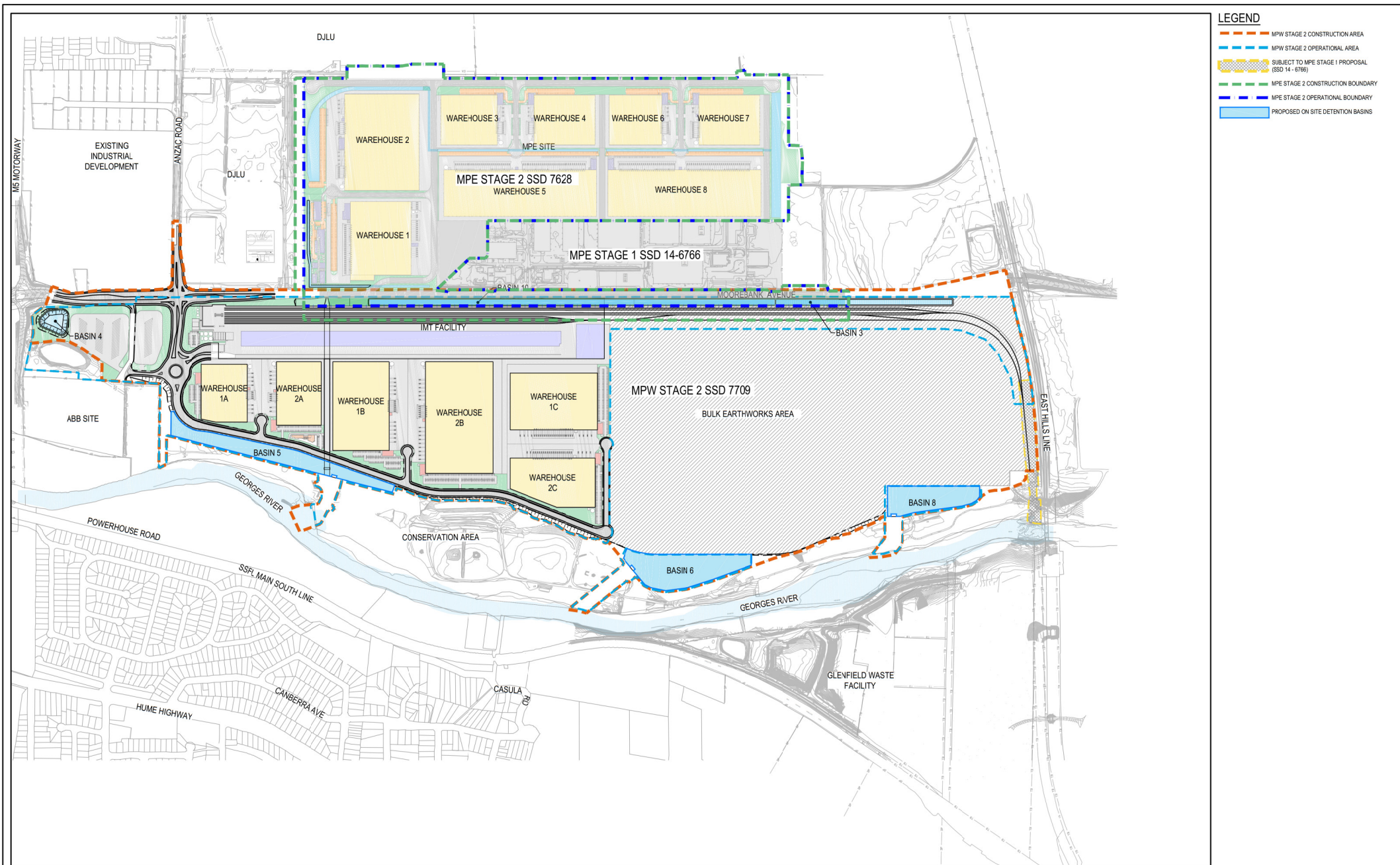
ARCADIS

Arcadis Australia Pacific Pty Limited
Level 5, 141 Walker St
NORTH SYDNEY NSW 2060
ABN 76 104 485 289

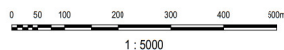
Tel No: +61 2 8907 9000
Fax No: +61 2 8907 9001
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Drawing No. | Project No. | Issue

SKC-MIC2-025 -AA003760- 01



Issue	Description	Date
#1	ISSUE FOR INFORMATION	19/09/2017



Client

SIMTA | SYDNEY INTERMODAL TERMINAL ALLIANCE

TACTICAL | GROUP

Status		FOR INFORMATION	
INDICATIVE / CONCEPT AND SUBJECT TO CONFIRMATION DURING DETAILED DESIGN		Current Issue Signatures	
Scales		1 : 5000	Drawn
Original Size		A1	Designed
Height		AHD	Checked
Datum		MGA	Approved
Grid			
Filename: PREC-ARC-CV-SKC-0237-GeneralArrangementPlan.dwg			

Project	
MOOREBANK INTERMODAL OVERALL PRECINCT	
Title	
GENERAL ARRANGEMENT PLAN	

ARCADIS

Arcadis Australia Pacific Pty Limited
Level 5, 141 Walker St
NORTH SYDNEY NSW 2060
ABN 76 104 485 289

Tel No: +61 2 8907 9000
Fax No: +61 2 8907 9001
arcadis.com

Project No: AA009335

Drawing No: PREC-ARC-CV-SKC-0237- 01

Issue

Appendix C

Response to gap analysis

Table C.1 **Response to gap analysis**

Comment Number	EMM Comment	Proponent Response (Arcadis 31/07/17)	Final review comment
1	provide ambient noise monitoring data charts and/or raw electronic data from locations L1 to L3 as referenced from the MPW Concept Plan EIS (precise reference not provided and seemingly no longer available online)	Ambient noise monitoring data, in the form of noise logger plots were included in Appendix B of Technical Paper 2: Noise and Vibration Impact Assessment (SLR Consulting, 2014); prepared to support the Moorebank Intermodal Terminal Concept EIS. (https://majorprojects.affinitylive.com/public/246a966ba837c880137b190133ac9dd7/050%20Technical%20Paper%202_%20Noise%20and%20vibration%20(Part%20B).pdf).	Noted and this issue is considered addressed.
2	provide separate site plan showing each of the seven construction stages' equipment placements used in the model, relative to surrounding land-uses	As discussed in Section 8.4 of the EIS, a total sound power level (SWL) was developed for each works period that was representative of all plant in the period operating simultaneously. Each SWL was then modelled as a single area source based on the footprint of the work period. These source regions are provided in Appendix D of the MPW Stage 2 RtS. For the works period involving Moorebank Avenue, the total SWL of all plant as a single area source was modelled over the region shown on the figure. Since that works period also involved the internal roads on the MPW site, activities on the MPW site were also modelled, and then the highest predicted noise levels for each catchment was presented. For the additional covered drain within the Endeavour Energy easement, as identified for the Amended Proposal, plant items were modelled as a line source, as shown in the figure provided at Appendix D of the MPW Stage 2 RtS.	The additional explanation provides some clarification on the approach. A plan was found in Attachment B (Supplementary response material) to a letter RtS to DP&E, Arcadis 27/04/17). This plan seems to show the entire site as a 'construction source region' and therefore does not provide any further refinement of the modelling as requested.

Table C.1 **Response to gap analysis**

Comment Number	EMM Comment	Proponent Response (Arcadis 31/07/17)	Final review comment
3	as for item 2, provide same for operational noise sources (eg route for trucks on site for day, evening and night scenarios, and position of all major noise sources such as the reach stackers, other container handling equipment and locomotives)	<p>Information in relation to the location of operational infrastructure including rail lines and warehousing, and operational truck routes are shown in Section 4 of the EIS. For clarity, the following operational equipment would generally be associated with the use of the following operational areas:</p> <ul style="list-style-type: none"> • IMT – reach stackers, container handling equipment, heavy vehicle movements and loading and unloading and locomotives • Warehousing – container handling equipment, heavy and light vehicle movements loading and unloading • Internal road network and truck holding areas – heavy and light vehicle movements. <p>A full list of operational noise sources included in the noise assessment is included in Section 8 and Appendix N of the EIS.</p>	This issue has not been addressed (plan not provided). Section 4 of the EIS provides at Figure 4.9 Operational traffic movements (on public roads and by rail). No onsite noise source plan. Although the additional explanation does provide some clarification on the approach.
4	clarify meteorological conditions used in modelling for the night time period (see section 7.1.2 of the noise impact assessment (NIA))	<p>Night time operational noise levels were predicted for two meteorological scenarios; calm and adverse.</p> <p>‘Calm’ meteorological conditions used for night-time operational noise modelling were based on Pasquill-Gifford stability class D (CONCAWE Weather Category 4) which is characterised by no wind and a mild temperature lapse.</p> <p>‘Adverse’ meteorological conditions used for night-time operational noise modelling were based on Pasquill-Gifford stability class F (CONCAWE Weather Category 6), which is characterised by source to receiver winds up to 3m/s and/or temperature inversion.</p> <p>These conditions are considered consistent with Section 5 of the Industrial Noise Policy (INP) (NSW EPA, 2000) to assess operational activities.</p>	Noted and this issue is considered addressed.

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5	clarify representation of locomotives on site as referenced at Section 7.2.2 of the NIA that states "...a combined SWL of 111dBA,...". Confirming if this is for the eight modelled locomotives on site or per locomotive	The combined sound power level (SWL) of 111dBA represents all eight modelled locomotives combined. As presented in Table 7-1 of the Noise and Vibration Impact Assessment (Appendix N of the EIS), the continuous sound power levels, adopted for assessment purposes, for stationary and (slowly) moving locomotives are 100 dBA and 106 dBA, respectively. When considered over an amenity assessment period, the locomotives would spend more time idling than they would moving. Therefore, the combined SWL of 111 dBA is considered to be a conservative representation of the combined SWL of the locomotives. Alternatively, the intrusiveness modelling scenario, presented in Section 7.2.3, assumes that eight locomotives are all moving on the site in a worst case 15-minute period, and assigns a combined SWL of 115 dBA for the locomotives.	Noted and this issue is considered addressed.
6	confirm rail track curvature radii between the site and SSFL connection (eg provide a 2-D alignment map to scale or in digital format that can be used to measure radii)	An assessment of the impacts from the operation of the Rail Link connection to the Southern Sydney Freight Line is included in the MPE Stage 1 Approval (SSD 14-6766) and is outside the scope of this Proposal. The Proposal seeks approval to operate on, and not for the construction of, the Rail link.	This issue has not been addressed.

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7	<p>Section 8.2.2 implies that existing rail traffic noise is significant and that the additional movements are not significant in terms of volumes when compared to existing. An analysis of existing rail noise levels at the three residential areas should be provided and the expected change in rail noise due to the Proposal demonstrated to "unlikely to noticeably increase due to the Proposal". For example, the reference to 77 Leacocks Lane and Lot 21 Leacocks Lane noise levels is unclear (stated as 3 to 5 dB increase because of the relative shielding to the track for these two locations). It is unclear if this issue is limited to this location or a small number of properties or if this issue extends across many properties</p>	<p>An assessment of rail noise from the Proposal has been included in Section 8 and Appendix N of the EIS. A projected rail noise impact assessment has been undertaken and is included at Appendix D of the MPW Stage 2 RtS. Based on the corrected measurements as included in the Noise Technical Memorandum, provided at Attachment B of this memorandum, the predicted $L_{Aeq,period}$ rail noise levels at nearby noise sensitive as a result of the Proposal comply with the RING criteria for private non-network rail lines at all receivers, except Casula. Therefore, a more detailed assessment of L_{Aeq} rail noise levels in Casula was considered warranted, and requires that the existing levels of rail noise be established at this location only.</p> <p>Rail noise modelling indicates that the $L_{Aeq,period}$ rail noise levels from the Proposal would comply with the RING criteria for "private non-network rail lines" in Wattle Grove and Glenfield, but would exceed the night time criterion by up to 4 dB in Casula. These criteria are considered particularly stringent to the extent that the existing L_{Aeq} and L_{Amax} noise levels are already above the criteria. L_{Aeq} and L_{Amax} rail noise levels at the most sensitive residential receivers near the Rail link are predicted to exceed the established noise goals. However, due to the proximity of these receivers to the Southern Sydney Freight Line, rail movements associated with the Proposal are not expected to result in a noticeable change to the existing L_{Aeq} and L_{Amax} rail noise levels.</p> <p>Further rail noise monitoring has been undertaken in February 2017 to greater establish existing rail noise levels at Casula, which would be representative of noise levels at 77 Leacocks Lane and Lot 21 Leacocks Lane. Existing levels of rail noise have been established at a number of locations in Casula, including the area where the Rail Infrastructure Noise</p>	<p>The highlighted 4dB exceedance of the RING criteria for Casula residences must be justified by consideration and application of all feasible and reasonable mitigation and management measures.</p>

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		<p>Guideline (RING) criterion is predicted to be exceeded. At the rail noise monitoring locations, it is demonstrated that the Proposal would result in an increase in the night time $L_{Aeq,period}$ rail noise level of less than 2 dB, which is considered unlikely to be noticeable and does not warrant mitigation. It should be noted that the existing rail noise levels are greater than the contribution from the Proposal.</p> <p>The existing rail noise levels that have been established as part of the additional monitoring are representative of a number of properties near the Proposal, including 77 Leacocks Lane and Lot 21 Leacocks Lane, Casula.</p>	

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8	confirm whether it will be an average of eight locomotives (as per Section 7.2.2) or seven trains (as per Section 8.2.3) per day at the site. Confirm what the typical and maximum train movements will be to/from site across the daytime and night time periods, and provide an assessment of these	<p>A description of the Proposal including the proposed rail movements is included in Section 4 of the EIS.</p> <p>During normal site operations it is anticipated that two trains would be on site at any one time, with eight locomotives present on site at any one time. Operations at the IMT facility would accommodate up to 12 train movements per day (6 in each direction). An assessment of the potential noise impacts from train movements is included in Section 8 and Appendix N of the EIS.</p> <p>The statement that 7 trains would access the site per day, as per Section 8.2.3 of the NVIA included in Appendix N, is incorrect.</p>	This issue is considered addressed.

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9	confirm what, if any, feasible and reasonable mitigation or management was considered to abate noise level exceedances identified in Section 8 due to train movements, or justify why these would not be adopted	<p>A detailed discussion of the potential noise impacts from the Proposal and the requirement for mitigation is included in Section 8 and Appendix N of the EIS and has been updated in the Noise Technical Memorandum, at Appendix D of the MPW Stage 2 RtS.</p> <p>As part of the Noise Technical Memorandum, additional monitoring of existing rail noise levels at nearby noise sensitive receivers was undertaken. Increases in rail noise from the Proposal on nearby noise sensitive receivers were validated using the additional monitoring undertaken. The Noise Technical Memorandum demonstrates compliance with the established RING criteria for private non-network rail lines at the monitoring locations, with the exception of RM1 (Casula), where the predicted evening and night time L_{Aeq} rail noise levels from the Proposal exceed the RING criterion for a private non-network rail line by 1.2 dBA and 3.9 dBA, respectively. However, at this location, the Proposal would result in an increase in the total evening and night time L_{Aeq} rail noise levels of less than 2 dBA, which is considered unlikely to be noticeable, and therefore mitigation is not considered necessary.</p> <p>The predicted increase in total rail noise levels during the evening, with the Proposal, at RM2 (Casula) is more than 2 dBA. However, the predicted $L_{Aeq,evening}$ rail noise level at RM2, due to the Proposal alone, would comply with the RING criterion for a private non-network rail line. As the increase in rail noise is not likely to be noticeable, and the increase in rail noise from the Proposal would not result in an exceedance of the RING criteria at this location no mitigation is considered necessary.</p>	<p>The additional assessment in the technical memo confirms RING criteria are exceeded at RM1 during the evening and night periods. With respect to exceedances, the RING states "...the proponent should consider feasible and reasonable action to reduce the noise down towards these levels and the noise impact assessment should provide justification if they cannot be met." The attempt to justify the exceedance by mixing non-network with network rail noise is not consistent with the RING. Network rail lines are afforded separate noise criteria in the RING as they provide a service to the community.</p>

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10	existing road traffic noise levels should be provided in addition to the quote(d) increases in Section 9	<p>Road noise levels for the Proposal have been assessed in accordance with the NSW Road Noise Policy (RNP)(DECCW, 2011). The RNP states that:</p> <p><i>For existing residences and other sensitive land uses affected by additional traffic on existing roads generated by land use developments, any increase in the total traffic noise level should be limited to 2 dB above that of the corresponding 'no build option'.</i></p> <p>Increases in road traffic noise levels along the M5 Motorway, Moorebank Avenue, and Anzac Road as a result of the Proposal are considerably less than 2 dBA. In accordance with the RNP, no mitigation of traffic noise levels is considered necessary. As the Proposal is unable to affect existing road noise levels, existing road noise levels are not considered relevant to the Proposal.</p>	The existing traffic noise levels were found in Attachment B (Supplementary response material) in the letter RtS to DP&E, Arcadis 31/07/17). Hence this issue is considered addressed.

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11	confirm no cumulative construction noise is expected during out of hours periods or provide an assessment of such as per the standard hours cumulative assessment at Section 10.4 of the NIA	<p>Both the MPW and MPE projects have identified the potential of out-of-hours (OOH) construction activities. Therefore, it is foreseeable that OOH construction activities associated with both projects could occur concurrently.</p> <p>OOH works for construction of the MPE Stage 1 Project would comprise low noise generating activities, generally in accordance with OOH works detailed in the ICNG, and would be undertaken in accordance with the night-time construction noise management levels prescribed in Table 9-4 of the MPE Stage 1 EIS (Arcadis, 2015). The OOH works as part of the construction of the MPE Stage 1 Project are expected to be low noise generating activities, and would be undertaken in consultation with the relevant authorities and in accordance with the CEMP for the MPE Stage 1 Project.</p> <p>OOH works as part of the Proposal are expected to comprise materials delivery and direct placement or stockpiling. The construction noise levels during OOH works period 1 (6am to 7am weekdays), OOH works period 2 (6pm to 10pm weekdays), OOH works period 3 (7am to 8am Saturday) and OOH works period 4 (1pm to 6pm Saturday) are not predicted to exceed Proposal specific noise criteria at sensitive receivers. The cumulative construction of the Proposal during OOH periods with the MPE Stage 1 Project would be managed through the implementation of the CEMP for the Project, which would include an out of hours protocol that would take into consideration cumulative out of hours construction works.</p>	<p>This issue has not been addressed. The response defers the issue to the CEMP to be prepared in future. It will therefore be reviewed at that time and otherwise condition appropriately, should DP&E grant approval.</p>

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12	provide confirmation on why the SEARs item 6 f) was not addressed in full in respect of the listed guidelines ie DoP 2008 and EPA's vibration guideline. Alternatively, provide a detail vibration impact assessment from proposed construction activities to demonstrate vibration impacts are not likely as stated (eg provide offset distances from typical plant and activities and compare these to actual separation distances to sensitive receivers including residences and other structures)	<p>Table 6-10 in Section 6.6 of the NVIA presents the safe working distances, as presented in the Construction Noise Strategy (TCA, 2012), for vibration intensive plant most likely to be used during the construction of the Proposal. The safe working distances in TCA (2012) have been developed specifically to satisfy the requirements of the EPA's vibration guideline – Assessing Vibration: a technical guide (DECCW, 2006) as requested by the SEARs. At the time of preparing the NVIA, no sensitive buildings or land uses, for cosmetic damage or human response, had been identified within the safe working distances of the identified construction plant.</p> <p>In response to submissions received for the Proposal, a Noise Technical Memorandum has been developed to further assess the potential for vibration impact on Kitchener House. The assessment investigates potential impacts from a wider range of construction plant and considers relevant international standards for vibration impacts on historic buildings. The construction activities most likely to generate vibration at Kitchener House would be the use of vibration-intensive equipment for road works along Moorebank Avenue, namely the use a vibratory roller.</p> <p>Based on the construction footprint for works on Moorebank Avenue, there is potential for construction plant to be operated approximately 20 metres from Kitchener House, which, depending upon the type and size of plant, could come within the safe working distance of Kitchener House.</p> <p>Additional mitigation measures for the Construction works anticipated to encroach within 20m of Kitchener house have been proposed to be included in the Construction Environmental Management Plan (CEMP) to ensure that the current of Kitchener House is not worsened by the construction works and the potential construction vibration</p>	This issue is considered addressed.

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		<p>impacts are adequately managed by the construction contractor.</p> <p>No other buildings are predicted to be affected by vibration during construction of the Proposal.</p> <p>Development Near Rail Corridors and Busy Roads – Interim Guideline (DoP, 2008) provides guidance on the assessment and mitigation of noise and vibration impacts for developments that would introduce new sensitive receivers into areas near existing transport infrastructure. The Proposal would not create new sensitive receivers near existing transport infrastructure, and therefore, DoP 2008 is not considered relevant to the NVIA for the Proposal.</p>	
13	confirm which mitigation measures listed in Table 11-1 would be adopted for the Proposal	<p>Table 11-1 in the NVIA (Appendix N of the EIS) contains REMMs relevant to the noise and vibration assessment. All REMMs listed in Table 11-1 would be implemented where reasonable and feasible for the Proposal as required by the MPW Concept Approval (SSD 5066). In addition to this, a number of mitigation measures for noise which would be implemented for the Proposal are included in Section 22 of the EIS.</p>	This issue is considered addressed.



SYDNEY

Ground floor, Suite 01, 20 Chandos Street
St Leonards, New South Wales, 2065
T 02 9493 9500 F 02 9493 9599

NEWCASTLE

Level 1, Suite 6, 146 Hunter Street
Newcastle, New South Wales, 2300
T 02 4907 4800 F 02 4907 4899

BRISBANE

Level 4, Suite 01, 87 Wickham Terrace
Spring Hill, Queensland, 4000
T 07 3839 1800 F 07 3839 1866