

Chapter 7

Revised environmental management measures



7. Revised environmental management measures

This chapter presents the revised environmental management measures that MIC proposes to implement to reduce the identified environmental impacts associated with the construction and operation of the Project.

7.1 Overview

Chapter 28 – *Environmental Management Framework* of the EIS documented a range of environmental management measures that MIC and its nominated developer/operator would implement to reduce the identified environmental impacts associated with the construction and operation phases of the project. These management measures were subsequently updated for the Response to Submissions report to account for the change in concept design layout and were presented in Chapter 9 – *Revised environmental management measures* of the Response to Submissions report.

Subsequent to the public exhibition of the Response to Submissions report, MIC proposes to further amend the environmental management measures for the Project in response to:

- Issues raised in submissions received during the public exhibition period of the EIS and Response to Submissions Report (as outlined in Chapter 4 – *Response to government agency submissions* and Chapter 5 – *Response to community submissions* of this report).
- Additional investigations undertaken since the public exhibition of the Response to Submissions report (as described in Chapter 6 – *Additional investigations and clarifications* of this report).
- Ongoing discussions with SIMTA who are the developer and operator of the terminal facility and who will be responsible for implementing the management and mitigation measures.

As stated in the EIS, the environmental management framework would include an overarching Environmental Management System (EMS) that complies with AS/NZS ISO 14001:2004 (refer to Figure 7.1). This EMS would be developed at the next stage of approval. In accordance with the Australian Government Environmental Management System Tool (DoE undated), the EMS would comprise a structured system to:

- identify environmental impacts associated with the organisation's business activities (including confirming and clarifying impacts of the Project detailed in this EIS and revised in the Response to Submissions Report));
- assess how the organisation meets its legal and other requirements relating to environmental aspects;
- plan for and demonstrate that steps have been taken to reduce or prevent environmental harm from occurring as a result of the organisation's business activities; and
- improve environmental performance (by applying the principle of continuous improvement).

The EMS would include an Environmental Policy that articulates the overall intentions and directions of the GBE (and/or the selected contractor(s)) regarding its environmental performance, and provides a formal means for management to express commitment to environmental management and improvement.

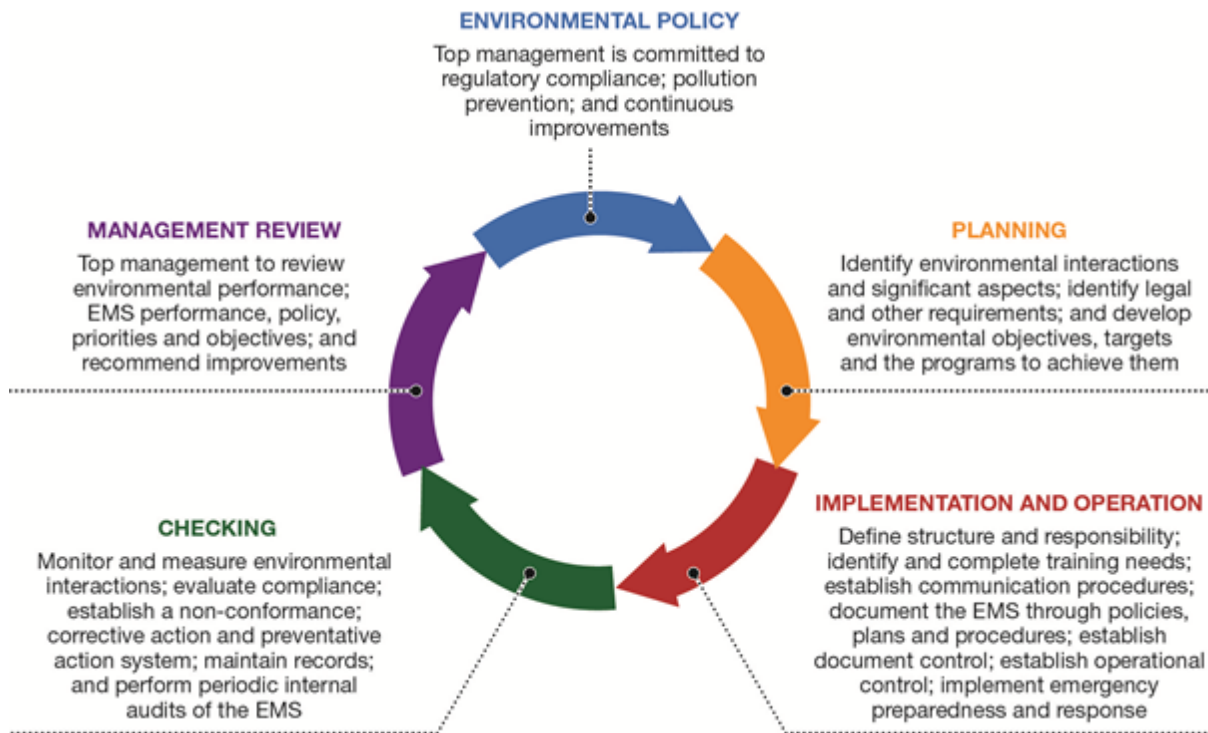


Figure 7.1 Overall environmental management framework for the Project

Beneath the EMS would sit a suite of environmental management plans (EMPs) or their equivalents, for example construction environmental management plans (CEMPs) and operational environmental management plans (OEMPs).

7.2 Project environmental objectives

The overarching environmental objectives of the Project are as follows:

- Comply with all relevant environmental standards and approvals during the life of the Project.
- Provide a high standard of environmental management which reflects good planning, implementation and recognition of all features of the environment.
- Comply with statutory requirements, regulatory approvals and regulatory reporting (Commonwealth and NSW).
- Protect people, the environment and property.
- Commit to achieving the highest possible performance in all aspects of the Project in regard to environmental practices.
- Establish, implement and maintain an EMS.

More specific environmental objectives have been developed as part of the Provisional EMPs (included in Volume 2, Appendix G of the EIS).

7.3 Environmental measures

Table 7.1 outlines the revised environmental management and mitigation measures for the Project. This table supersedes Table 9.1 Management and mitigation measures from Chapter 9 – *Revised environmental management measures* in the Response to Submissions report. As described in Section 8.3 of the Response to Submissions Report, the table includes various categories of measurement including:

- Measures marked 'M' in column 3 of the table are mandatory and are firm mitigation commitments. There is still some potential for these measures to be reviewed or new measures to be added.
- Measures marked 'SR' in column 3 of the table are subject to review during staged State significant development (SSD) approval processes and/or detailed design, when more detail about the Project design and operation would be available.
- Column 4 details the proposed timing of implementation of the measures.
- Columns 5 and 6 provide explanation and/or additional information regarding:
 - > why the individual measures are proposed, i.e. what potential risk/outcome are they designed to mitigate (column 5); and
 - > how effective the individual measures are expected to be in mitigating the potential risk/outcome, relative to an unmitigated condition (column 6).
- Definitions of the predicted risks/outcomes shown in Column 5 are taken from the risk definition matrix in Table 29.4 of Chapter 29 – *Environmental risk analysis*.
- In column 6, Note 2: Where the effectiveness of measures was not quantifiable, predicted effectiveness was assessed qualitatively using the following definitions:
 - > High predicted effectiveness – high likelihood that potential risk/impact can be mitigated based on proven experience on other similar projects and/or specialist knowledge.
 - > Medium predicted effectiveness – medium likelihood that potential risk/impact can be mitigated based on proven experience on other similar projects and/or specialist knowledge.
 - > Low predicted effectiveness – low likelihood that potential risk/impact can be mitigated based on proven experience on other similar projects and/or specialist knowledge.

The final four columns indicate the relevance of each measure to the construction and operation of the IMT site and the southern rail access option.

To supplement the mitigation and management measures, a suite of Provisional Environmental Management Plans (EMPs) were produced for the project, showing in detail the management measures that would be required to be applied during project construction and operation. These EMPs or their equivalents will be finalised by SIMTA who are the developer and operator of the terminal.

Table 7.1 Management and mitigation measures

No.	Mitigation measure	Mandatory (M)/subject to review (SR)	Implementation phase	Predicted risk/outcome if measure not implemented (i.e. reason for proposed measure)	Predicted effectiveness of measure(s) or outcome relative to unmitigated condition	Applicability		
						IMT site	Southern rail access connection	Warehousing
General environmental management								
Proposed environmental framework								
1A	An EMS that complies with AS/NZS ISO 140001:2004 would be developed and implemented on the Project site.	M	Detailed design, early works, construction and operation	High risk that overall environmental impacts of Project would not be managed effectively.	High level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	●	●
1B	EMPs including CEMPs and OEMPs (or equivalent) would be prepared for the Project. At this point, Provisional EMPs (included in Volume 2, Appendix H of the EIS) have been prepared and would be updated as more is known about the Project phasing including detailed design, construction and operation.	M	Detailed design and/or Early Works, construction, operation where relevant	High risk that overall environmental impacts of Project would not be managed effectively.	High level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	●	●
Consultation								
2A	A Community Engagement Plan (CEP) (or equivalent) would be prepared to outline community involvement and consultation activities during early works, construction and operation phases. As a minimum, the CEP would include appropriate measures for community involvement, including: <ul style="list-style-type: none">a direct telephone number (24 hour);an email address;a postal address;regular project updates;a community liaison representative; and scheduled meetings with a local representative body such as a community consultative (or liaison) committee. The CEP would also set out a guide on expectations for responding to relevant information received from community members.	M	Early Works, construction and operation	High risk that community impacts would not be effectively mitigated, plus high level of anxiety/concern in community regarding the Project and its impacts.	High level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	●	●
2B	The CEP would be prepared to ensure: <ul style="list-style-type: none">the community and stakeholders have a high level of awareness of all processes and activities associated with the Project;accurate and accessible information is made available; anda timely response is given to issues and concerns raised by stakeholders and the community.	M	Early Works, construction and operation	As per measure 2A.	As per measure 2A.	●	●	●
Sustainability								
3A	The final design would (as a minimum) provide for sustainability outcomes generally in accordance with the sustainability initiatives identified in Table 9.4 in Chapter 9 – <i>Project sustainability</i> of the EIS.	SR	Detailed design	High risk that ecologically sustainable development objectives listed in Table 9.4 of the EIS would not be achieved.	High level of effectiveness in mitigating risk when combined with measure 3B. Not possible/appropriate to quantify. Expected to achieve ecologically sustainable development objectives listed in Table 9.4 of the EIS.	●	●	●
3B	Implementation of sustainability initiatives would be monitored in accordance with the monitoring framework developed as part of the EMS for the next stage of approvals. This framework would identify sustainability indicators for monitoring.	M	Detailed design Early Works, construction and operation	As per measure 3A	As per measure 3A.	●	●	●

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Traffic, transport and access								
4A	The Project team would continue to liaise with the Australian Rail Track Corporation, Transport for NSW and other stakeholders responsible for the management of the rail freight network regarding the capacity of the network related to the project.	M	Detailed design and future development applications	Moderate risk that rail freight network capacity is inadequate to service full development of Project (import/export (IMEX) and interstate).	Effectiveness limited as Project cannot control wider network upgrades (beyond scope of Project). Not possible/appropriate to quantify.	●	●	N/A
4B	As part of the Stage 2 SSD approval(s) process further analysis would be undertaken to determine likely demand distribution and capacity across the rail freight network as it relates to the project.	M	Detailed design and future development applications	Moderate risk that rail freight network capacity is inadequate to service full development of Project (import/export (IMEX) and interstate).	Effectiveness limited as Project cannot control wider network upgrades (beyond scope of Project). Not possible/appropriate to quantify	●	●	
4C	Install a variable message signage system within the Project site to direct heavy vehicles and facilitate safe and efficient access and navigation.	SR	Detailed design, construction and operation	Moderate injury risk associated with pedestrian–vehicle collision or vehicle–vehicle collision due to poor signage.	High level of effectiveness. Not possible/appropriate to quantify.	●	N/A	N/A
4D	Consider the provision of pedestrian and cyclist connections from Moorebank Avenue into the Project site.	SR	Detailed design, construction and operation	Moderate pedestrian and cyclist injury risk.	High level of effectiveness. Not possible/appropriate to quantify.	●	N/A	●
4E	Consider the provision of staff storage and shower areas to promote cycling, jogging and walking as modes of transport.	SR	Detailed design, operation	Minor risk – reduced incentive to switch from car travel to sustainable transport.	Medium level of effectiveness. Not possible/appropriate to quantify.	●	N/A	●
4F	Negotiate with bus operators for the provision of additional bus stops and increased bus services between the Project site and nearby public transport interchange hubs to reduce the volume of light vehicles generated by staff. This would be determined based on staff numbers and likely patronage numbers.	SR	Detailed design	Minor risk – reduced incentive to switch from car travel to sustainable transport.	Medium level of effectiveness. Not possible/appropriate to quantify.	●	N/A	N/A
4G	Undertake detailed design and staging of the Project rail link construction works to ensure: <ul style="list-style-type: none">connection with the Southern Sydney Freight Line (SSFL) is designed to minimise construction impacts on SSFL operations;connection with the SSFL would allow trains to exit and enter the SSFL main line at a maximum design speed of 45 kilometres per hour (km/h);trains entering and leaving the Project site endeavour to minimise adverse disruption to other operations on the SSFL; andthe Project's internal train control system and signalling integrates with the SSFL system where required.	SR	Detailed design and construction	Moderate impact on safe operation of SSFL.	Medium level of effectiveness. Not possible/appropriate to quantify.	●	●	N/A
4H	Prior to all future development application stages, in consultation with Transport for NSW and other relevant agencies of NSW Government, ensure that adequate arrangements are in place to ensure that: 1. The impacts of additional traffic associated with the future development application stages will minimise Project related traffic impacts and consider the capacity of the road network, taking account of background traffic growth and planned road network improvements. 2. Arrangements are in place (irrespective of funding source) for the on-time delivery of the necessary road network improvements referred to in point 1 above. The contribution of MIC towards road network improvements as envisaged by this mitigation measure would be subject to the following conditions:	M	Future development applications	Major risk to traffic road network.	Medium-high level of effectiveness. Refer to Table 7.19 for quantification of proposed improvements.	N/A	N/A	N/A

No.	Mitigation measure	Mandatory (M)/subject to review (SR)	Implementation phase	Predicted risk/outcome if measure not implemented (i.e. reason for proposed measure)	Predicted effectiveness of measure(s) or outcome relative to unmitigated condition	Applicability		
						IMT site	Southern rail access connection	Warehousing
	<ul style="list-style-type: none"> That certain throughput levels at the terminal had been achieved. These throughputs are outlined in column 1 of Table 7.20 of the Response to Submissions report. That it can be further demonstrated (as part of any subsequent planning approval stage) that the intersection performance would have deteriorated to a Level of Service E or worse (where previously operating at a LoS D or above) were it not for the implementation of the upgrades outlined in Table 7.20 of the Response to Submissions report. 							
Traffic management plans								
The following mitigation measures would be implemented as part of the traffic management plans to be prepared for the Project:								
4I	Reducing the volumes of construction vehicles travelling during peak periods, especially if the increase in traffic generated by construction activities impedes on the operation of Moorebank Avenue.	SR	Early Works and construction	Moderate risk of exacerbating peak hour traffic congestion and delays to construction deliveries (and waste/spoil removal).	Medium level of effectiveness if implemented. Quantification of traffic impacts not undertaken to date.	●	N/A	N/A
4J	Maintain access to neighbouring properties. It is particularly important that the ABB site has access throughout the construction stages.	M	Early Works and construction	Risk of adverse impacts on ongoing operation of businesses.	High level of effectiveness. Not possible/appropriate to quantify.	●	N/A	●
4K	In addition to the Community Engagement Plan (or equivalent) (Refer to 2A), a communication plan will be developed to provide information to the relevant authorities and bus operators in addition to the local community. The communication plan will need to incorporate a contact list with the chain of command.	M	Early Works, construction and operation	Risk of poor community understanding of impacts on their activities.	Medium level of effectiveness. Effectiveness will depend on the nature of the plan and mechanisms for disseminating information.	●	●	●
4L	Implement relevant traffic control measures to inform drivers of the construction activities and locations of heavy vehicle access locations.	M	Early Works and construction	Risk of poor community understanding of impacts on their activities.	Medium level of effectiveness. Effectiveness will depend on the nature of the TCPs and mechanisms for disseminating information.	●	●	●
4M	Obtain Road Occupancy Licences (ROLs) as necessary.	M	construction	Statutory requirements.	High level of effectiveness.	●	●	N/A
4N	Develop an emergency response plan for the modification of Moorebank Avenue. During this phase, emergency vehicles using Moorebank Avenue as a transport route would need to be considered, as well as emergency access to adjoining properties.	M	Construction of the modification to Moorebank Avenue	Risk of suboptimal emergency response – risk to human life and property.	Medium to high level of effectiveness. Not possible/appropriate to quantify.	●	N/A	N/A
4O	Traffic on Moorebank Avenue would be monitored during peak periods to ensure that queuing at intersections does not impact on other road users.	M	Early Works	Moderate risk of exacerbating traffic congestion and delays to construction deliveries.	Medium to high level of effectiveness. Not possible/appropriate to quantify.	●	N/A	N/A
4P	Modify access locations in response to the development of the Moorebank Avenue modification.	M	Construction of modification to Moorebank Avenue	Moderate risk of exacerbating traffic congestion and delays to construction deliveries.	Medium to high level of effectiveness. Not possible/appropriate to quantify.	●	N/A	N/A
4Q	Provision of alternate suitable pedestrian and cycle and facilities during the construction of Moorebank Avenue modifications retaining well defined and well signed routes and paths.	SR	Construction of modification to Moorebank Avenue	Minor risk of exacerbating traffic congestion and delays to construction deliveries.	Medium level of effectiveness.	●	N/A	N/A
Noise and vibration								
Construction noise and vibration								
5A	A construction noise and vibration management plan (CNVMP) (or equivalent) would be developed for construction activities.	M	Construction	Moderate risk of breaching construction noise goals.	Medium level of effectiveness – may not guarantee compliance as indicated by Chapter 17 – <i>Noise and vibration</i> .	●	●	●

No.	Mitigation measure	Mandatory (M)/subject to review (SR)	Implementation phase	Predicted risk/outcome if measure not implemented (i.e. reason for proposed measure)	Predicted effectiveness of measure(s) or outcome relative to unmitigated condition	Applicability		
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5B	The appropriateness of the noise and vibration management and mitigation measures in 5C to 5T are to be further investigated as part of the future development applications. These measures, or their replacement measures, are to be implemented through the CNVMP (or equivalent) prior to and during all noise-generating construction works for each of the Project phases.	M	Future development applications and construction	Risk of exceedance of construction and operational noise goals.	Medium to high level of effectiveness. Not possible/appropriate to quantify.	●	●	●
5C	Standard construction hours Construction activities associated with the Development shall be undertaken during the following standard construction hours: a) 7.00 am to 6.00 pm Mondays to Fridays, inclusive; and b) 8.00 am to 1.00 pm Saturdays; and c) at no time on Sundays or public holidays	SR	Construction	Moderate risk of complaints for work outside standard hours.	Medium to high level of effectiveness.	●	●	●
5D	Construction works outside of the standard construction hours identified in condition 5C may be undertaken in the following circumstances: a) construction works that generate noise that is: i) no more than 5 dB(A) above rating background level at any residence in accordance with the Interim Construction Noise Guideline (Department of Environment and Climate Change, 2009); and ii) no more than the noise management levels specified in Table 3 of the Interim Construction Noise Guideline (Department of Environment and Climate Change, 2009) at other sensitive receivers; or b) for the delivery of materials required outside these hours by the NSW Police Force or other authorities for safety reasons; or c) where it is required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm; d) works approved through an EPL, or e) works as approved through the out-of-hours work protocol outlined in the CEMP.	SR	Construction	Refer to Item 5X.	Refer to Item 5X.	●	●	●
5E	During site inductions and toolbox talks, all site workers (including subcontractors and temporary workforce) are to be made aware of the hours of construction and how to apply practical, feasible and reasonable measures to minimise noise and vibration when undertaking construction activities.	SR	Construction	Moderate risk of breaching construction noise goals, resulting in complaints.	Medium level of effectiveness. Not possible/appropriate to quantify.	●	●	●
5F	Quieter and less vibration-emitting construction methods would be applied where feasible and reasonable. For example, when piling is required, bored piles rather than impact-driven piles would minimise noise and vibration impacts.	SR	Construction	Major risk of breaching construction noise goals, resulting in complaints.	Medium level of effectiveness. Quantification depends on activity/source.	●	●	●
5G	The construction site would be arranged to minimise noise impacts by locating potentially noisy activities away from the nearest receivers wherever possible.	SR	Construction	Major risk of breaching construction noise goals, resulting in complaints.	High level of effectiveness. Quantification depends on activity/source.	●	●	●
5H	Where possible, equipment that emit directional noise would be oriented away from sensitive receptors.	SR	Construction	Moderate to high risk of impact resulting in complaints.	Medium level of effectiveness. Not possible/appropriate to quantify.	●	●	●
5I	Reversing of vehicles and mobile equipment would be minimised so as to prevent nuisance caused by reversing alarms. This could be achieved through one-way traffic systems and the use of traffic lights which could also limit the use of vehicle horns.	SR	Construction	Moderate to high risk of impact resulting in complaints.	Medium level of effectiveness. Not possible/appropriate to quantify.	●	●	●

No.	Mitigation measure	Mandatory (M)/subject to review (SR)	Implementation phase	Predicted risk/outcome if measure not implemented (i.e. reason for proposed measure)	Predicted effectiveness of measure(s) or outcome relative to unmitigated condition	Applicability		
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5J	Where work is proposed in the vicinity of residences, potentially affected residents would be advised, at least two weeks prior to the commencement of works, of the potential noise and vibration levels and the proposed management measures to control environmental impacts.	SR	Construction	Moderate risk of impact resulting in complaints.	Medium level of effectiveness. Not possible/appropriate to quantify.	●	●	●
5K	Whenever possible, loading and unloading areas would be located away from the nearest residences.	SR	Construction	Major risk of breaching construction noise goals, resulting in complaints.	High level of effectiveness.	●	●	●
5L	Broadband reversing alarms would be considered instead of tonal reversing alarms, in particular outside standard working hours (such as during night-time rail possession works).	SR	Construction	Major risk of breaching construction noise goals, resulting in complaints.	High level of effectiveness.	●	●	●
5M	Equipment that is used intermittently would be shut down when not in use for extended periods of time.	SR	Construction	Level of risk depends on source but potential breaching of construction noise goals, resulting in complaints.	Level of effectiveness depends on activity/source.	●	●	●
5N	Where possible, all engine covers would be kept closed while equipment is operating.	SR	Construction	Source dependent but major risk of breaching construction noise goals, resulting in complaints.	High level of effectiveness.	●	●	●
5O	Where possible, trucks associated with the work would not be left standing with their engines operating in streets adjacent to or within residential areas.	SR	Construction	Major risk of breaching construction noise goals, resulting in complaints.	High level of effectiveness.	●	●	●
5P	Traffic speeds would be signposted. All drivers would be expected to comply with speed limits and to implement responsible driving practices to minimise noise associated with unnecessary acceleration and braking. Traffic movements should be scheduled to minimise continuous traffic flows (convoys).	SR	Construction	Major risk of breaching construction noise goals resulting in complaints.	High level of effectiveness.	●	●	●
5Q	The site manager (as appropriate) should provide a community liaison phone number and permanent site contact so that any noise and/or vibration related complaints can be received and addressed in a timely manner. Consultation and cooperation between the site and its neighbours would assist in limiting uncertainty, misconceptions and adverse reactions to noise and vibration.	SR	Construction	Major risk of noise complaints.	High level of effectiveness.	●	●	●
5R	Attended noise and ground vibration measurements would be undertaken at monthly intervals. In areas within close proximity to sensitive receivers and upon receipt of adverse comment/complaints during the construction program, to confirm that noise and vibration levels at adjacent communities and receptors are consistent with the predictions in this assessment and any approval and/or licence conditions.	SR	Construction	Moderate risk of community backlash in the event of no response to complaints. Minor risk of identifying non-compliance.	High level of effectiveness.	●	●	●
5S	If noise generating construction works are undertaken outside the standard daytime construction hours and/or measured construction noise levels at nearest residences are greater than 75 dB(A) L_{Aeq} , the following additional noise mitigation measures would be considered: <ul style="list-style-type: none"> Localised acoustic screens, comprising a solid structure such as plywood fencing to surround noise generating construction plant or work locations. To be effective for ground level noise, the screens would be lined with acoustic absorptive material, at least 2 m in height and installed within 5 m of the noise source. Dominant noise-generating mechanical plant would be fitted with feasible noise mitigation controls such as exhaust mufflers and engine shrouds. 	SR	Construction	Level of risk depends on source but potential breach of construction noise goals, resulting in complaints.	Medium level of effectiveness. Not possible/appropriate to quantify.	●	●	●

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						IMT site	Southern rail access connection	Warehousing
	<ul style="list-style-type: none"> Respite periods of one hour are recommended for every continuous three-hour period of work; alternatively, daytime works would be scheduled between 9.00 am and 12.00 pm, and between 2.00 pm and 5.00 pm. Where practical, and when night works are being undertaken, noisy construction work would be undertaken during the less sensitive 6.00 pm to 10.00 pm evening period. 							
5T	<p>Depending on the specific construction works undertaken, construction noise mitigation may need to be implemented:</p> <ul style="list-style-type: none"> where piling works (required for all rail access connection options) are undertaken within approximately 600 m of residences in Casula and within approximately 800 m of residences in Glenfield; for rail access connection works where daytime construction works undertaken within 450 m of nearest receptors in Casula; and where rail construction is required up to 1400 m from residences outside the standard daytime hours, such as during track possession works. 	SR	Construction	Major risk of noise complaints.	Medium level of effectiveness. Not possible/appropriate to quantify.	N/A	●	N/A
Operational noise and vibration								
5U	<p>To achieve the noise reductions outlined in Table 7.30 of the Response to Submissions report and the Revised Project Noise and Vibration Impact Assessment report in Appendix F, mitigation treatments may be required to reduce noise from all dominant noise sources. The Project would implement reasonable and feasible noise mitigation to control potential noise levels. In the event that the Project does not meet the assessment criteria at receptors, if the Project has reduced noise levels to be as low as practicable, the NSW Industrial Noise Policy (INP) (EPA 2000b) notes that:</p> <ul style="list-style-type: none"> achievable noise limits can be negotiated with regulators and the community; and the Project specific noise mitigation measures and noise levels outlined in Table 7.30 of this report and in the Noise and Vibration Assessment (Appendix F) should not automatically be interpreted as conditions for approval without consideration of other factors (environmental, social and economic) consistent with the objectives of the EP&A Act. In this regard, where appropriate, the INP notes that noise limits can be set above the Project specific noise levels. 	SR	Detailed design and operation	Major risk of breaching operation noise goals, leading to complaints.	High level of effectiveness.	●	●	●
5V	Where practical operational plant and equipment would be selected to reduce noise emissions.	SR	operation	Major risk of breaching operation noise goals, leading to complaints.	High level of effectiveness.	●	N/A	●
5W	Mechanical components on fixed and mobile equipment, such as motors, gearboxes and exhausts, would include enclosures and acoustic insulation (lagging) (as necessary) to limit noise emissions.	SR	operation	Major risk of breaching operation noise goals, leading to complaints.	High level of effectiveness.	●	N/A	●
5X	Where feasible, motors and mechanical noise-generating components of the rail mounted gantries (RMGs) would be located near to ground level rather than at the top of the gantry.	SR	Detailed design and operation	Risk of ongoing complaints.	Moderate to high level of effectiveness.	●	N/A	N/A
5Y	Where reasonable and feasible, and where it would produce a lower noise emission, electric motors would be operated instead of diesel powered equipment.	SR	Operation	Risk of ongoing complaints.	Moderate to high level of effectiveness.	●	N/A	●

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5Z	<p>The following measures would be considered and where possible incorporated into the design and operation of the freight trains on the rail track on the main IMT site to control potential operational noise:</p> <ul style="list-style-type: none"> The track on the rail access connection would be designed to minimise adverse changes in vertical alignment, to reduce the requirement for locomotives to operate at high throttle on the ascent or under heavy braking on the descent. The rail access connection bridge would be designed as a concrete or composite/concrete structure or more suitably noise mitigating structure to minimise potential re-radiated noise from vibrating sections of the elevated track. Detailed noise analysis would be undertaken to identify both airborne and re-radiated noise contributions, to effectively mitigate total noise emissions. Locomotives accessing the main IMT site should have approval to operate on the network consistent with the noise limits for locomotives detailed in the ARTC Environmental Protection Licence No. 3142. 	SR	Detailed design and operation	Risk of ongoing complaints.	High level of effectiveness.	●	N/A	N/A
5AA	Unless for health and safety reasons, heavy vehicles should avoid the use of horns within the main IMT site.	SR	Operation	Risk of ongoing complaints.	High level of effectiveness.	●	N/A	N/A
5AB	<p>To further control potential rail noise from wheel squeal the following measures are proposed:</p> <ul style="list-style-type: none"> Track greasing systems should be investigated on curved sections of track to lubricate and reduce friction at the wheel–rail interface. The track maintenance system would include measures such as grinding to remove rail roughness, treatment of roughness on the wheels of locomotives and wagons, and adjustment of bogie-suspension tracking and brake system set up. 	SR	Detailed design and operation	Risk of ongoing complaints.	High level of effectiveness.	●	●	N/A
5AC	Where feasible, all rail tracks would be designed to maximise the separation distance between rail lines and the nearest residences.	SR	Detailed design	Risk (dependent on track design) of breaching operation noise goals, leading to complaints.	High level of effectiveness, but dependent on track design.	●	●	N/A
5AD	<p>Noise walls or noise barriers would be installed within the main IMT site where required</p> <p>In regard to noise walls or barriers, if required:</p> <ul style="list-style-type: none"> Noise walls/barriers would need to be solid structures, typically constructed of concrete or similar material. Additional absorptive material could be applied to the internal facades of the noise walls/barriers to reduce reflected noise from the wall/barriers. TEU containers could be used as noise barriers where they are stacked, to effectively impede the direct line of sight to nearest receptors. Onsite noise walls/barriers would be constructed at the earliest opportunity in the Project development to provide noise attenuation during all subsequent construction and operation phases. Subject to further consideration of environmental, social and economic impacts, earth mounding could be considered as an alternative to, or in conjunction with, noise walls/barriers to attenuate the propagation of noise between the site and nearest affected receptors. For the southern rail access, it is 	SR	Detailed design and operation	Risk of breaching operation noise goals, leading to complaints.	High level of effectiveness, but dependent on wall design.	●	N/A	N/A

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						IMT site	Southern rail access connection	Warehousing
	proposed that earth mounding be considered on the main IMT site, at the western extent of the IMEX and interstate rail lines.							
5AE	Where feasible, all onsite buildings and structures would be designed and constructed to impede noise from ground level operation of heavy vehicles, side picks and ITVs.	SR	Detailed design	Risk of ongoing complaints.	Effectiveness will depend on the design of the IMT. Potential for medium to high effectiveness.	●	N/A	●
Operational noise management								
5AF	Before the start of each phase of operations, an operational noise and vibration management plan (ONVMP) (or equivalent) would be developed and implemented. The ONVMPs would detail the operation of the relevant Project phase, the potential offsite operational noise levels as determined during the detailed design process, and all measures to manage and mitigate operational noise and vibration.	SR	Pre-operation and operation	Moderate risk of breaching operation noise goals, leading to complaints.	High level of effectiveness.	●	●	●
5AG	As a minimum, the ONVMP (or equivalent) would include: <ul style="list-style-type: none"> the operational noise criteria/limits as defined by the relevant Project approvals and Environmental Protection Licence; identification of all surrounding receptors and land use that would be potentially sensitive to noise and vibration; identification of all noise and vibration generating operations and the timing of these operations; the location and specification of any onsite and offsite noise mitigation, including the requirement for future mitigation as part of the staged operation; detailed measures for managing operational noise, including checklist and auditing procedures to ensure measures are implemented before the start of noise generating activity; procedures for the monitoring and reporting of operational noise and vibration; procedures for consultation with the community regarding operational noise and vibration; and complaint handling procedures. 	SR	Pre-operation and operation	Moderate risk of breaching operation noise goals, leading to complaints.	High level of effectiveness.	●	●	●
5AH	During detailed design, where practical and feasible to do so, consideration would be given to: <ul style="list-style-type: none"> undertaking locomotive maintenance during the daytime and evening period between 7.00 am and 10.00 pm; operating heavy vehicles to limit the requirement for reversing and audible reversing alarms; and appropriate commitment – either contractual or operational – that rail operators accessing the site would be required to undertake regular maintenance of all trains to address wheel flat spots and locomotive exhausts. 	SR	Pre-operation and operation	Moderate risk of breaching operation noise goals, leading to complaints.	High level of effectiveness.	●	●	●
Further assessment								
5AI	The noise and vibration measures described in 5U–5AH above would be subject to further consideration during detailed design. At that point, the predicted noise impacts and the likely effectiveness of the measures (or equivalent alternative measures) would be further investigated. This further investigation would include consideration of potential environmental, social and economic impacts of the measures. It is also proposed that the following points be considered in the further assessment of potential impacts and design of mitigation measures:	M SR (mitigation measures)	Detailed design	High risk of complaints.	Potentially high level of effectiveness, depending on the outcomes of the assessment and the mitigation measures employed as a result.	●	●	●

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	<ul style="list-style-type: none">Assessment of potential noise emissions from any concrete batching plant, and implementation of any required noise mitigation, would be undertaken by the appointed construction contractor upon confirmation of the design and operation of the concrete batching plant.During detailed design of the Project, consideration of either an automated container handling area or electrically powered plant for the interstate terminal (as per the IMEX terminal), or alternatively the use of plant with the lowest available noise emissions.During the detailed design of the Project, more detail on the operating plant and machinery for the Project may be known. This may include the provision of one-third octave band noise emission data from equipment vendors to facilitate a detailed assessment of annoyance characteristics in accordance with the NSW Industrial Noise Policy (INP) (EPA 2000b).To the west of the site, consideration of a noise barrier 4.5 m in height at the haul road to mitigate noise from trucks operating within the Project site using a combination of acoustic barriers, solid walls or earth mounding to fully impede the line of sight between the nearest receptors in Casula and the haul road.To verify the predicted noise levels and recommended noise mitigation in the noise and vibration assessment, the predictive assessment of potential noise levels would be revised for the detailed design of the construction and operation of the southern rail access. This would include an assessment of sleep disturbance impacts from rail spur operations. Where deemed necessary, mitigation measures may be required to reduce and control maximum noise events from sources such as locomotive exhausts and wagon bunching.The specific vibration propagation characteristics can be highly variable depending on the ground conditions at a given location. It is recommended that ground vibration impacts be reviewed during the detailed design, particularly where Project rail track would pass within 50 m of residences.							
Noise and vibration monitoring								
5AJ	<p>The ambient noise monitoring surveys within Casula, Wattle Grove and Glenfield would be continued throughout the construction and operation of the Project (with annual reporting of noise results up to two years beyond the completion of Full Build). The noise surveys would quantify any potential noise from the Project and identify any trends/changes in the ambient noise environment during the progressive development.</p> <p>The measured noise levels and contribution from the operation of the Project would be continually applied to the detailed design of the Project to ensure it includes appropriate mitigation measures to reduce and control noise during construction and operation. The monitoring data would also include any changes to the ambient noise environment from new or changed developments in the area.</p> <p>In the event of any noise or vibration related complaint or adverse comment from the community, noise and ground vibration levels would be measured at the potentially affected premises, where reasonable and feasible. In accordance with procedures in the</p>	SR	Detailed design, construction and operation	If recommended measures are not implemented, complaints handling could become difficult.	High level of effectiveness.	●	●	●

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	CNVMP and ONVMP, the measured noise and/or vibration levels would then be assessed to ascertain if remedial action is required.							
Biodiversity								
6A	<p>Following detailed design and before construction, detailed flora and fauna mitigation measures would be developed and presented as part of the CEMP. These detailed measures would incorporate the measures listed in 6B to 6W.</p> <p>The CEMP would address:</p> <ul style="list-style-type: none"> • general impact mitigation; • staff/contractor inductions; • vegetation clearing protocols; • pre-clearing surveys and fauna salvage/translocation; • rehabilitation and restitution of adjoining habitat; • weed control; • pest management; and • monitoring. <p>The plans would include clear objectives and actions for the Project including how to:</p> <ul style="list-style-type: none"> • minimise human interferences to flora and fauna; • minimise vegetation clearing/disturbance; • minimise impact to threatened species and communities; • minimise impacts to aquatic habitats and species; and • undertake flora and fauna monitoring at regular intervals. 	M	Early Works and construction	Without a detailed description of the steps required to implement each measure and identification of the party responsible, there is a risk that measures would not be correctly implemented.	<p>High level of effectiveness.</p> <p>Not possible/appropriate to quantify.</p>	●	●	●
6B	Vegetation clearing would be restricted to the construction footprint and sensitive areas would be clearly identified as exclusion zones.	M	Early Works and construction	If vegetation clearing is not restricted to the construction footprint, unnecessary clearing could cause additional impacts on biodiversity.	<p>High level of effectiveness.</p> <p>Not possible/appropriate to quantify.</p>	●	●	●
6C	The exclusion zones would be marked on maps, which would be provided to contractors, and would also be marked on the ground using high visibility fencing (such as barrier mesh).	M	Early Works and construction	Without clear delineation of clearing limits and no-go areas, there is a risk of unnecessary vegetation clearing and associated impacts on biodiversity.	<p>High level of effectiveness.</p> <p>Not possible/appropriate to quantify.</p>	●	●	●
6D	A trained ecologist would accompany clearing crews to ensure disturbance is minimised and to assist in relocating any native fauna to adjacent habitat.	M	Early Works and construction	Without input from an ecologist, there is a higher risk that native animals would be injured or killed. Unqualified staff may not recognise potential shelter sites (e.g. tree hollows, woody debris) or have the skills necessary to assist animals to relocate to adjacent habitat.	<p>Medium level of effectiveness.</p> <p>Not possible/appropriate to quantify.</p>	●	●	●
6E	<p>A staged habitat removal process would be developed and would include the identification and marking of all habitat trees in the area.</p> <p>Where reasonable and feasible, clearing of hollow-bearing trees would be undertaken in March and April when most microbats are likely to be active (not in torpor) but are unlikely to be breeding or caring for young, and when threatened hollow-dependent birds in the locality are also unlikely to be breeding.</p> <p>Pre-clearing surveys would be conducted 12 to 48 hours before vegetation clearing to search for native wildlife (e.g. reptiles, frogs, Cumberland Land Snail) that can be captured and relocated to the retained riparian vegetation of the Georges River corridor.</p>	M	Early Works and construction	Without the implementation of a staged habitat removal process, there is a higher risk that native animals would be injured. Without appropriate pre-clearing surveys, and encouragement to leave roosts, animals are more likely to remain in habitat during clearing and to be at risk of injury or death.	<p>Medium level of effectiveness.</p> <p>Not possible/appropriate to quantify.</p>	●	●	●

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	<p>Vegetation would be cleared from a 10 m radius around habitat trees to encourage animals roosting in hollows to leave the tree. A minimum 48 hour waiting period would allow animals to leave.</p> <p>After the waiting period, standing habitat trees would be shaken (where safe and practicable) under the supervision of an ecologist to encourage animals roosting in hollows to leave the trees, which may then be felled, commencing with the most distant trees from secure habitat.</p> <p>Felled habitat trees would either be immediately moved to the edge of retained vegetation, or left on the ground for a further 24 hours before being removed from the construction area, at the discretion of the supervising ecologist.</p> <p>All contractors would have the contact numbers of wildlife rescue groups and would be instructed to coordinate with these groups in relation to any animal injured or orphaned during clearing.</p> <p>Within areas of high quality intact native vegetation proposed to be removed:</p> <ul style="list-style-type: none"> topsoil (and seedbank) is to be collected from native vegetation that are to be permanently cleared and used in the revegetation of riparian areas; and Native plants in areas that are to be permanently cleared are to be relocated and transplanted in riparian areas identified for rehabilitation. 							
6F	Relocation of fauna to adjacent retained habitat would be undertaken by an ecologist during the supervision of vegetation removal.	M	Early Works and construction	Native animals disturbed during vegetation removal would be at risk of being injured or killed by vehicle/plant movements and predation.	Medium level of effectiveness. Not possible/appropriate to quantify.	●	●	●
6G	An ecologist would supervise the drainage of any waterbodies on the Project site and would relocate native fish (e.g. eels), tortoises and frogs to the edge of the Georges River and/or the existing pond at the northern end of the IMT site.	M	Early Works and construction	Native aquatic animals disturbed during drainage of water bodies would be at risk of being injured or killed by earthworks, predation and desiccation/exposure.	Medium level of effectiveness. Not possible/appropriate to quantify.	●	●	●
6H	The design of site fencing and any overhead powerlines would consider the potential for collision by birds and bats and minimise this risk where practicable.	M	Early Works and construction	Powerlines can be collision and electrocution hazards for wildlife, particularly birds, bats and arboreal mammals. Fences can be collision hazards and, where they include barbed or razor wire, entanglement hazards. Powerlines and fences are therefore potential ongoing sources of wildlife injury and/or mortality.	Medium level of effectiveness. Not possible/appropriate to quantify.	●	●	●
6I	The potential for translocation of threatened plant species as individuals or as part of a soil translocation process would be considered during the detailed development of the CEMP.	M	Early Works and construction	If no individuals or progeny of the threatened plants recorded on site are used in vegetation restoration, a small reduction in the genetic variation within the local populations of these species is possible.	Medium level of effectiveness. Not possible/appropriate to quantify.	●	●	●
6J	Consideration would be given to fitting roost boxes to the bridge over the Georges River to provide roost sites for the Large-footed Myotis and other species of microbats (e.g. Eastern Bentwing-bat) which may utilise such structures. Provision of roost boxes under bridges has been identified as priority action for the recovery of the Large-footed Myotis.	SR	Detailed design	The Project may result in the removal of some potential roost sites (tree hollows) for the Large-footed Myotis. Without provision of roost boxes, a reduction in the availability of roosting habitat for this species may occur.	Medium level of effectiveness. Not possible/appropriate to quantify.	N/A	●	N/A

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6K	Important habitat elements (e.g. large woody debris) would be moved from the construction area to locations within the conservation area which would not be cleared during the Project, or to stockpiles for later use in vegetation/habitat restoration.	M	Pre-construction	If habitat elements such as large woody debris are not moved into retained habitat, animals that have been displaced by clearing and which rely on these resources may lack sufficient shelter or foraging habitat to persist.	Medium level of effectiveness. Not possible/appropriate to quantify.	●	●	●
6L	Winter-flowering trees would be preferentially planted in landscaped areas of the Project site to provide a winter foraging resource for migratory and nomadic nectar-feeding birds and the Grey-headed Flying-fox.	SR	Construction	Without the implementation of this measure, the Project would result in a greater long-term reduction in winter habitat for nectar-feeding species.	Medium level of effectiveness. Not possible/appropriate to quantify.	●	●	●
6M	A bridge/viaduct or similar design would be used for the railway crossing of the Georges River. This may allow connectivity of terrestrial habitat along the river banks underneath the bridge.	M (connectivity SR)	Detailed design	If connectivity of terrestrial habitat is severed, this would reduce the potential for movement of animals along the eastern banks of the Georges River to the north of the site; however, riparian habitat to the north of the site is highly degraded.	Medium level of effectiveness. Not possible/appropriate to quantify.	N/A	●	N/A
6N	Options for maintaining habitat connectivity would be investigated, and may include establishing native vegetation and placing habitat elements such as rock piles and large woody debris under the bridge to provide cover for fauna. Where reasonable and feasible options to allow light and moisture to penetrate under the Georges River bridge will be incorporated into the detailed design.	SR	Detailed design	As above.	Medium level of effectiveness. Not possible/appropriate to quantify.	●	●	●
6O	Erosion and sediment control measures such as silt fencing and hay bales would be used to minimise sedimentation of streams and resultant impacts on aquatic habitats and water quality.	M	Early works and construction	Without adequate control measures in place there would be a risk of a substantial increase in turbidity and sediment deposition in the Georges River. This could affect aquatic ecosystems by reducing light availability for aquatic plants, and visibility and oxygen availability for aquatic animals.	Medium level of effectiveness. Not possible/appropriate to quantify.	●	●	●
6P	The detailed design process for the bridge over the Georges River would consider disturbance to aquatic habitat and fish passage conditions. The design would as a minimum adhere to the fish friendly passage guidelines (Fairfull & Witheridge 2003) for waterway crossings.	M	Detailed design	If the design does not consider fish movement, there is a risk that the bridge may adversely affect fish passage along the Georges River.	High level of effectiveness. Not possible/appropriate to quantify.	N/A	●	N/A
6Q	Opportunities for planting of detention basins with native aquatic emergent plants and fringing trees would be explored in the detailed design of the Project and, if practicable, implemented so that they would provide similar habitat in the medium term to that lost through the removal of existing basins.	SR	Detailed design	If detention basins are not planted with native vegetation, there would be a reduction in the availability of this type of habitat for native waterbirds and frogs. This habitat is, however, likely to be of relatively low importance to threatened biodiversity.	Medium level of effectiveness. Not possible/appropriate to quantify.	●	N/A	N/A
6R	The CEMP (or equivalent) would include detailed measures for minimising the risk of introducing weeds and pathogens.	M	Construction	Without a detailed description of the steps required to implement weed management measures and identification of the party responsible, there is a risk that measures would not be correctly implemented and that weed species would proliferate.	High level of effectiveness. Not possible/appropriate to quantify.	●	●	●

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6S	The Project would include a long-term program for the duration of the Project operation of weed removal and riparian vegetation restoration within parts of the Georges River corridor, which would include monitoring landscaped areas for the presence of noxious and environmental weeds. A preliminary weed management strategy is provided in Appendix E of Technical Paper 3 – <i>Ecological Impact Assessment</i> in Volume 4 of the EIS, setting out the principles for the management of the riparian zone.	M	Pre-construction, construction and operation	Without a long-term program of weed removal and riparian vegetation restoration, weeds would be unlikely to be adequately controlled, and would be likely to dominate the vegetation of the site in the future.	Medium level of effectiveness. Not possible/appropriate to quantify.	●	N/A	N/A
6T	Appropriate design and landscape/vegetation management measures would be implemented to reduce the bushfire risk and threat to biodiversity.	M	Detailed design	If fire onsite is relatively frequent and/or intense, it may result in a reduction in habitat quality and loss of animal and plant species.	High level of effectiveness. Not possible/appropriate to quantify.	●	●	●
6U	The management of the conservation area along the Georges River would include management of fire regimes to promote biodiversity conservation.	M	Pre-construction, construction and operation	As above.	As above.	●	●	N/A
6V	The detailed design process would consider the potential groundwater impacts on ground-dependent ecosystems. In most cases, these impacts would be mitigated at the design phase.	M	Detailed design	If significant changes to groundwater conditions were to occur, vegetation and fauna habitat may be adversely affected, possibly resulting in a reduction in native biodiversity.	Medium level of effectiveness. Not possible/appropriate to quantify.	●	●	●
6W	The management plan for the Georges River riparian corridor (refer to Appendix E of Technical Paper 3 – <i>Ecological Impact Assessment</i> in Volume 4 of the EIS) would be implemented and would include a monitoring program designed to detect operational impacts.	M	Operation	Without a management plan, the biodiversity conservation objectives of the Georges River riparian corridor may not be achieved. If monitoring of operational impacts from the Project site is not conducted, they cannot be identified and mitigated.	Medium level of effectiveness. Not possible/appropriate to quantify.	●	N/A	N/A
6X	Ongoing monitoring of macroinvertebrate communities will be undertaken prior to, during and following construction upstream and downstream of the proposed impact at the Georges River Bridge and reference locations to assist identify any changes in aquatic communities.	M	Pre-construction and construction	Changes to the macroinvertebrates communities in a waterway are an indicator of water quality changes. If not undertaken, changes to the aquatic ecological environment may not be recorded.	Medium level of effectiveness. Not possible/appropriate to quantify.	●	●	N/A
Biodiversity Offsets strategy								
6Y	The Biodiversity Offsets Strategy detailed in Appendix C of the Response to Submissions report will be implemented.	M	Detailed design, construction and operation	Without the establishment of biodiversity offsets, the Project would result in a net reduction in biodiversity values in the region.	Medium level of effectiveness. Not possible/appropriate to quantify at this stage.	●	●	●
6Z	A riparian restoration plan (or equivalent) for the Georges River riparian zone and Casula offset area would be implemented. This plan includes areas outside the Conservation Area, including areas along the western bank of the Georges River The objectives of the plan include: <ul style="list-style-type: none"> restoration and revegetation of the riparian zone of the site to be consistent with, and complementary to, areas of remnant indigenous vegetation within the Georges River corridor (approximately 16.7 hectares (ha) of land to be revegetated); long-term eradication and suppression of the most detrimental weed species on the site including vine and woody weeds (approximately 20.0 ha of land to undergo a weed control program); consolidation and widening of the existing vegetation corridor of Georges River where feasible; 	M	Detailed design, construction and operation	In the absence of active management and restoration, the biodiversity values of the Georges River riparian zone would continue to decline as a result of competition from introduced plants.	Medium level of effectiveness. Not possible/appropriate to quantify.	●	N/A	N/A

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	<ul style="list-style-type: none"> improved habitat values for native animals and plants, particularly threatened species; and management of undesirable fauna species including introduced animal species and some Australian native animals which may be detrimental to the biodiversity of the Project site. 							
6AA	<p>Measures to manage undesirable fauna species include:</p> <ul style="list-style-type: none"> monitoring of the site for the presence of introduced and undesirable animal species as part of fauna monitoring; cooperating with government bodies, interest groups and adjacent landowners in regional pest management programs including the NSW Department of Primary Industries and the NSW Office of Environment and Heritage; managing the use of nest boxes by undesirable species by removing the eggs and/or young of introduced animals (e.g. Black Rat and Common Myna) under appropriate permit conditions; removing any insect colonies (bees, wasps, termites, ants found in nest boxes); and modifying or moving nest boxes to discourage use by undesirable species. 	SR	Construction and operation	Without management measures, undesirable species may have a moderate impact on flora and fauna.	Moderate to high level effectiveness.	●	●	●
Hazards and risks								
7A	<p>To minimise the risk of leakages involving natural gas, liquid natural gas (LNG) and flammable and combustible liquids to the atmosphere:</p> <ul style="list-style-type: none"> appropriate standards for a gas reticulation network, including AS 2944-1 (2007) and AS 2944-2 (2007), would be referred to in the detailed design process; correct schedule pipes would be used; a fire protection system would be installed if necessary for gas users; cathodic protection would be installed for external corrosion if appropriate; and access to the Project site would be secure. 	M	Detailed design, construction and operation	High	High predicted effectiveness.	●	●	●
7B	<p>To minimise the risks of leakage of LNG and liquid petroleum gas (LPG) and flammable liquids during transport:</p> <ul style="list-style-type: none"> materials would be transported according to the Australian Dangerous Goods (ADG) Code, relevant standards and regulations; and contractors delivering the gas would be trained, competent and certified by the relevant authorities. 	M	Detailed design, construction and operation	High	High predicted effectiveness.	●	●	●
7C	<p>To minimise hazards associated with venting of natural gas, LNG and LPG:</p> <ul style="list-style-type: none"> LNG storage would be designed to AS/NZS 1596-2008 standards; access to the Project site would be secure; and significant separation distances to residences and other assets would be put in place. 	M	Detailed design, construction and operation	High	High predicted effectiveness.	●	●	●
7D	Storage of flammable/combustible liquids would be carried out in accordance with AS 1940, with secondary containment in place and location away from drainage paths.	M	Detailed design, construction and operation	Moderate	High predicted effectiveness.	●	●	●

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7E	Standby or emergency generators and transformers would all have secondary containment.	M	Detailed design, construction and operation	Moderate	High predicted effectiveness.	●	●	●
7F	Oil coolers would generally be located in areas where leaks and runoff are appropriately controlled at source or in a retention basin.	M	Detailed design, construction and operation	Moderate	High predicted effectiveness.	●	●	●
7G	All systems would be designed in accordance with good engineering practice.	M	Detailed design	High	High predicted effectiveness.	●	●	●
7H	Appropriate testing, alarm systems, and workplace health and safety (WHS) safety precautions would be implemented.	M	Detailed design	Moderate	Moderate predicted effectiveness.	●	●	●
7I	No hazardous or regulated wastes would be disposed of onsite.	M	Construction and operation	Moderate	High predicted effectiveness.	●	●	●
7J	All offsite disposals would be carried out by approved transport operators and to approved facilities.	M	Construction and operation	Moderate	Moderate predicted effectiveness.	●	●	●
7K	Other dangerous goods, including any waste materials present on the Project site, would be suitably contained, with secondary containment and runoff controls implemented where appropriate to prevent leaks or spills migrating to environmentally sensitive areas, in particular via stormwater systems that drain to the Georges River.	M	Construction and operation	Moderate	High predicted effectiveness.	●	●	●
Bushfire risks								
7L	The aims and objectives of 'Planning for Bush Fire Protection' (RFS 2006) would be further considered, and the Rural Fire Service (RFS) consulted, during detailed design.	SR	Detailed design	Moderate	Moderate predicted effectiveness.	●	●	●
7M	A bushfire management plan (or equivalent) would be prepared for the Project site to develop the bushfire management measures in detail, in consultation with the RFS. The bushfire management plan (or equivalent) would detail the interaction between the Project footprint and biodiversity offset areas. In the event that no vegetation clearing is undertaken, the bushfire risk assessment and bushfire management plan (or equivalent) would be updated and appropriate mitigation measures provided in the design of the IMT.	M	Detailed design	High	High predicted effectiveness.	●	●	●
7N	Internal roads would be designed to enable safe access for emergency services and to allow crews to work with equipment aboard the vehicle, including providing: <ul style="list-style-type: none"> two-wheel drive, sealed all weather roads; internal perimeter road to be at least two lanes wide (8 m kerb to kerb); a minimum vertical clearance of 4 m; curves with a minimum inner radius of 6 m; and roads with capacity to carry fully loaded fire-fighting vehicles (15 tonnes). 	M	Detailed design	Moderate	High predicted effectiveness.	●	●	●
7O	Water supplies for fire-fighting would be easily accessible and located at regular intervals, including: <ul style="list-style-type: none"> reticulated water supply using a ring main system for the perimeter road; fire hydrant spacing, sizing and pressures complying with AS 2419.1–2005; location of hydrants outside of any road carriageway; and 	M	Detailed design	High	High predicted effectiveness.	●	●	●

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	<ul style="list-style-type: none"> ensuring all aboveground water pipes external to buildings are metal, including any taps. 							
7P	<p>Electricity services would be located to limit the possibility of ignition of surrounding bushland or the fabric of buildings, including:</p> <ul style="list-style-type: none"> where practicable, locating electrical transmission lines underground; where overhead electrical transmission lines are proposed, lines would be installed with short pole spacing (30 m); and no part of a tree would be closer to a power line than the distance set out in the specifications of Vegetation Safety Clearances issued by Energy Australia (NS179, April 2002). 	M	Detailed design	Moderate	High predicted effectiveness.	●	●	●
7Q	<p>Gas services would be located to avoid ignition of surrounding bushland or the fabric of buildings, including:</p> <ul style="list-style-type: none"> ensuring all aboveground gas service pipes external to buildings are metal (including connections); and ensuring reticulated or bottled gas is installed and maintained in accordance with AS 1596 and the requirements of relevant authorities. 	M	Detailed design	Moderate	Moderate predicted effectiveness.	●	●	●
7R	A fuel management plan (or equivalent) would be developed for the conservation zone and offset areas taking into consideration the ecological values of this area, including the presence of threatened biodiversity.	M	Detailed design	High	High predicted effectiveness.	●	N/A	N/A
7S	A landscape management plan (or equivalent) would be developed for any landscaped gardens within the Project site.	M	Detailed design	Moderate	High predicted effectiveness.	●	N/A	●
7T	<p>A fire safety and evacuation plan (or equivalent) would be developed that would:</p> <ul style="list-style-type: none"> include training requirements for staff on fire prevention and safety; provide a fire escape plan (designated meeting points and escape routes), and require regular fire drills; outline provision of a functional fire alarm system; outline equipment use restrictions during fire bans; and outline measures for arson prevention, including provision of adequate lighting and security to deter trespassers. 	M	Detailed design	High	High predicted effectiveness.	●	●	●
7U	A more detailed bushfire risk assessment would be undertaken following finalisation of design and layout, in consultation with the NSW Rural Fire Service.	M	Detailed design	Moderate	High predicted effectiveness.	●	●	●
Contamination and soils								
8A	Further investigations for the southern rail access would be undertaken including a targeted intrusive investigation to gather data on soils and groundwater quality so that management and/or remediation options can be evaluated.	M	Detailed design	Moderate risk that unidentified contamination in area could impact on construction deliveries, human health.	Medium to high level of effectiveness in identifying potential for contamination to be present on this portion of land.	N/A	●	N/A
8B	Before construction, a remediation program would be implemented in accordance with the Moorebank Intermodal Terminal Preliminary Remediation Action Plan (RAP) (or equivalent). The program will have been formally reviewed and approved by the Site Auditor under Part 4 of the NSW <i>Contaminated Land Management Act 1997</i> (CLM Act).	M	Detailed design and Early Works	Regulatory requirement, potential major risk to human health and the environment if remediation of identified contamination is not undertaken.	Medium to high level of effectiveness in mitigating impacts if remediation program is implemented.	●	●	●

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8C	A CEMP would be prepared by the contractor for all excavation and remediation works and would include requirements for decontamination facilities at the Project site.	M	Detailed design and Early Works	Moderate to high risk that remediation works could have detrimental impact on the environment.	High level of effectiveness in preventing environmental incidents as a result of remediation program.	●	●	●
8D	An unexploded ordnance (UXO) management plan (or equivalent) would be developed for the Project site. This plan would detail a framework for addressing the discovery of UXO or explosive ordnance waste (EOW) to ensure a safe environment for all Project staff, visitors and contractors.	M	Early Works	High risk to life and health of site workers if a UXO management plan (or equivalent) is not implemented and communicated.	High level of effectiveness if implemented and communicated to site staff.	●	N/A	●
8E	An ASS management plan (or equivalent) would be developed in accordance with the ASSMAC Assessment Guidelines (1998), with active ongoing management through the construction phases. Offsite disposal would need to be in accordance with the NSW Waste Classification Guidelines Part 4: Acid Sulfate Soils (2009).	M (testing and disposal requirements) SR (ASS management plan (or equivalent))	Detailed design	Moderate risk of ASS affecting construction works, with environmental impacts resulting in a regulatory breach.	High level of effectiveness if ASS testing is completed and any required management plan is implemented.	●	N/A	●
8F	Further testing of residual sediments would be undertaken to gather data to inform the management of sediments likely to be disturbed/dewatered during construction.	M	Detailed design	Moderate risk that areas of contaminated soil are not identified or remediated and complete site validation is not achieved.	High level of effectiveness if testing is completed and results are used to inform the design process.	●	N/A	●
8G	Ground penetrating radar (GPR) or similar techniques would be used to locate and document all existing and underground tank infrastructure across the Project site.	M	Detailed design	Moderate risk that underground infrastructure is not identified or remediated and complete site validation is not achieved.	Medium level of effectiveness in identifying underground structures.	●	N/A	●
8H	A management tracking system for excavated materials would be developed to ensure the proper management of the material movements at the Project site, particularly during excavation works.	M	Detailed design	Regulatory requirement to monitor waste tracking and achieve site validation. Moderate to high risk to environment if soil/waste tracking is not undertaken.	High level of effectiveness.	●	●	●
8I	Contaminated soil/fill material present will be 'chased out' during the excavation works based on visual, olfactory and preliminary field test results.	M	Early works and construction	Moderate to high risk to construction activities and site validation if contaminated material is not identified.	High to medium effectiveness in confirming extent of identified contamination.	●	●	●
8J	Excavated soil would be temporarily stockpiled, sampled and analysed for waste classification processes. Subject to receipt of waste classification results, the material would be transported to a licensed offsite waste disposal facility as soon as practicable to minimise dust and odour issue through storage of materials on site.	M	Early works and construction	High risk of regulatory breach.	High level of effectiveness.	●	●	●
8K	Stockpiled soils would be stored on a sealed surface and the stockpiled areas would be securely bunded using silt fencing to prevent silt laden surface water from entering or leaving the stockpiles or the Project site.	M	Early works and construction	High risk of impact on environment and regulatory breach.	High level of effectiveness.	●	●	●
8L	All excavation works associated with potential contaminated lands would be undertaken by licensed contractors, experienced in remediation projects and the handling of contaminated soils.	M	Early works and construction	High risk to human health if inexperienced contractors are used.	High level of effectiveness.	●	●	●
8M	All asbestos removal, transport and disposal would be performed in accordance with the <i>Work Health and Safety Regulation 2011</i> (WHS Regulation).	M	Early works and construction	Moderate to high risk of regulatory breach, high risk to human health.	High level of effectiveness.	●	N/A	●
8N	The removal works would be conducted in accordance with the National Occupational Health and Safety Commission Code of Practice for the Safe Removal of Asbestos, 2nd Edition [NOHSC 2002 (2005)] (NOHSC 2005a).	M	Early Works and construction	Moderate to high risk of regulatory breach, high risk to human health.	High level of effectiveness.	●	N/A	●

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						IMT site	Southern rail access connection	Warehousing
8RO	An appropriate asbestos removal licence issued by WorkCover NSW would be required for the removal of asbestos contaminated soil.	M	Early Works and construction	Moderate to high risk of regulatory breach, high risk to human health.	High level of effectiveness.	●	N/A	●
8P	Environmental management and WHS procedures would be put in place for the asbestos removal during excavation to protect workers, surrounding residents and the environment.	M	Early Works and construction	Moderate to high risk of regulatory breach, high risk to human health.	High level of effectiveness.	●	N/A	●
8Q	Temporary stockpiles of asbestos containing material (ACM) soils would be covered to minimise dust and potential asbestos release.	M	Early Works and construction	High risk to human health.	High level of effectiveness.	●	N/A	●
8R	An asbestos removal clearance certification would be prepared by an occupational hygienist at the completion of the removal work. This would follow the systematic removal of asbestos containing materials and any affected soils from the Project site, and validation of these areas (through visual inspection and laboratory analysis of selected soil samples).	M	Early Works and construction	Moderate to high risk of regulatory breach, high risk to human health.	High level of effectiveness.	●	N/A	●
8S	Asbestos fibre air monitoring would be undertaken during the removal of ACMs and in conjunction with the visual clearance inspection. The monitoring would be conducted in accordance with the National Occupational Health and Safety Commission Guidance Note on the Membrane Filter Method For the Estimating Airborne Asbestos Fibre, 2nd Edition [NOHSC 3003 (2005)] (NOHSC 2005b).	M	Early Works and construction	Moderate to high risk of regulatory breach, high risk to human health.	High level of effectiveness.	●	N/A	●
8T	All stockpiles would be maintained in an orderly and safe condition. Batters would be formed with sloped angles that are appropriate to prevent collapse or sliding of the stockpiled materials.	M	Early Works and construction	High risk to human health.	High level of effectiveness.	●	●	●
8U	Stockpiles would be placed at approved locations and would be strategically located to mitigate environmental impacts while facilitating material handling requirements. Contaminated or potentially contaminated materials would only be stockpiled in un-remediated areas of the Project site or at locations that did not pose any risk of environmental impairment of the stockpile area or surrounding areas (e.g. hardstand areas).	M	Early works and construction	High risk to environment.	High level of effectiveness.	●	●	●
8V	Stockpiles would only be constructed in areas of the Project site that had been prepared in accordance with the requirements of the Project Preliminary RAP in Appendix F of Technical Paper 5 – Environmental Site Assessment (Phase 2), Volume 5A and 5B. All such preparatory works would be undertaken before material is placed in the stockpile. Stockpiles must be located on sealed surfaces such as sealed concrete, asphalt, high density polyethylene or a mixture of these, to appropriately mitigate potential cross contamination of underlying soil.	M	Early works and construction	Moderate risk to environment and further contamination of soil.	High level of effectiveness.	●	●	●
8W	Any stockpiles of contaminated material would be covered with a waterproof membrane (such as polyethylene sheeting) to prevent increased moisture from rainwater infiltration and to reduce wind-blown dust or odour emission.	M	Early works and construction	Moderate risk to the environment.	High level of effectiveness.	●	●	●
8X	Before the reuse of any material on site, it would be validated so that the lateral and vertical extent of the contamination is defined.	M	Early Works and construction	Moderate risk of importing or reuse of contaminated soil.	High level of effectiveness.	●	●	●
8Y	Where required, contaminated materials and wastes generated from the Project remediation and construction works would be taken to suitable licensed offsite disposal facilities.	M	Early Works and construction	High risk to human health and environment if wastes are not disposed of appropriately.	High level of effectiveness.	●	●	●

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8Z	Where necessary, consider undertaking further investigations to determine whether other buildings have organochlorine pesticides (OCP) impacts subgrade materials, and to quantify the volume of OCP impacted materials across the site.	SR	Early Works and construction	Risk to human health and environment if wastes are not disposed of appropriately.	High level of effectiveness.	●	N/A	●
8AA	Additional Aqueous Film Forming Foam Assessment (AFFF) be undertaken to determine if any direct remedial and/or management actions are required. A stage approach is considered appropriate and is detailed in the Preliminary AFFF Assessment (Golder Associates 2015b).	MR	Early Works and construction	Moderate risk to human health if encountered during construction	High level of effectiveness.	●	N/A	N/A
Hydrology, groundwater and water quality								
9A	A soil and water management plan (or equivalent) would be developed before work begins in the conservation area. This plan would include erosion and sediment control plans (ESCPs) and procedures to manage and minimise potential environmental impacts associated with developing this area.	M	Early Works	Moderate to high risk to the environment.	High level of effectiveness.	●	N/A	N/A
9B	Site compounds, stockpiling areas and storage areas for sensitive plant, equipment and hazardous materials would be located above an appropriate design flood level, which would be determined based on the duration of the construction works.	M	Early Works and construction	Moderate to high risk of flooding of sensitive areas containing sensitive plant, equipment and materials during a long construction period.	Selection of an appropriate flood level above which sensitive areas would be located, based on the duration of the construction period, would reduce this flood risk to low.	●	N/A	●
Regional flooding								
9C	Implement a staged construction process for the building of the Georges River bridge that minimises temporary obstruction of flow in the main channel and floodplain where reasonable and feasible.	SR	Construction	Moderate to high risk to the environment.	Moderate level of effectiveness.	N/A	●	N/A
9D	For the building of the Georges River bridge, design temporary works to resist forces and pressures that could occur during the design flood event adopted for the Project construction.	M	Construction	Moderate to high risk of collapse of temporary works if subjected to unforeseen or not allowed for flood loading – e.g. working platforms for bridge construction, temporary protection/formwork for bridge piers and abutments.	Allowing for additional flood loads during extreme events would reduce this risk to low. Note: it would not be possible to fully design out this risk, as there would be a remote possibility of a very extreme event occurring during construction that is not practical or economic to design.	N/A	●	N/A
9E	For all site works, provide temporary diversion channels around temporary work obstructions to allow low and normal flows to safely bypass the work areas.	M	Construction	Moderate to high risk of flooding of parts of the site during a storm event if temporary diversions are not provided.	Provision of diversions to an appropriate standard of protection would reduce this risk to low (see also note in brackets above).	●	●	●
9F	The potential effects of various flood events on construction phase works would be further investigated during detailed design and preparation of the Stage 2 SSD approval(s).	M (investigation) SR (additional mitigation)	Detailed design	Moderate to high risk to the environment. Additional controls may be required to address moderate to high flood risks during construction.		●	●	●
9G	The design of the Georges River bridge would ensure structural stability under an appropriate upper limiting flood event, typically the 1 in 2000 year AEP event or other event of similar magnitude.	M	Detailed design	Moderate to high risk of structural damage to bridge due to flood loading if an appropriate design standard is not adopted.	Reduction of this risk to low or within acceptable limits as defined by structural design codes and standards.	N/A	●	N/A
9H	A detailed scour assessment of the structure would be undertaken and a scour protection scheme for the bridge abutments and piers would be designed to ensure structural stability and to avoid erosion of the channel and floodplain bed local to the structure.	M	Detailed design	Moderate to high risk of structural damage to bridge due to flood scour if an appropriate design standard is not adopted.	Reduction of this risk to low or within acceptable limits as defined by structural and scour design codes and standards.	N/A	●	N/A
9I	Further design optimisation of the bridge would consider reducing the afflux impacts as far as possible. The bridge piers would be designed to minimise obstruction to flow and associated afflux under potential blockage and/or debris build-up scenarios.	SR	Detailed design	Low to moderate risk of unacceptable afflux impacts due to the new bridge.	Further reduction of this risk to low following design optimisation (see also note in brackets above for item 9D).	N/A	●	N/A

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9J	Further hydraulic modelling would be undertaken to quantify the impact of climate change on afflux caused by the bridge and on hydraulic loading on the bridge structure.	M	Detailed design	Low to moderate risk of unacceptable afflux impacts due to the new bridge. Unacceptable structural stability risks to bridge under extreme flood event loading with climate change.	Further reduction of this risk to low following design checks to assess climate change impacts (see also note in brackets above for item 9D).	N/A	●	N/A
Onsite stormwater and surface water quality								
9K	The following staging process would be considered to be implemented when constructing surface water drainage infrastructure: <ul style="list-style-type: none"> Biofiltration and detention basins that form part of the proposed stormwater management strategy would be excavated at the first phase of development, with the intention that the excavated basins would be used as temporary construction phase sedimentation basins. Once these construction phases become operational, these temporary construction phase sedimentation basins could be developed into the permanent biofiltration and detention basins. During the relevant phase of development, all major stormwater pipes and culverts (600 mm diameter and larger) and main channels and outlets would be installed. Minor drainage and upstream systems would then be progressively connected to the major drainage elements during each phase of construction as required. 	M	Construction	Moderate to high risk of areas of the site flooding and consequent erosion of disturbed areas and sedimentation of local watercourses.	Early construction of basins and main channels and pipes in the recommended sequence will reduce erosion and sedimentation risks to low.	●	N/A	●
9L	A soil and water management plan (or equivalent) would be developed before land was disturbed that would include erosion and sediment control plans (ESCPs) and procedures to manage and minimise potential environmental impacts associated with construction of the Project. The ESCP(s) for the Project would be prepared in accordance with Volume 1 of Managing Urban Stormwater: Soils and Construction ('the Blue Book') (Landcom 2004), Managing Urban Stormwater: Soils and Construction – Installation of Services, Volume 2A (OEH 2008) and Managing Urban Stormwater: Soils and Construction – Main Road Construction, Volume 2D (OEH 2008). The ESCP(s) would be established before the start of each construction phase and would be updated as relevant to the changing construction activities. Strategies to be considered as part of the plan include: <ul style="list-style-type: none"> clean runoff from upstream undisturbed areas would be diverted around the Project site to minimise overland flow through the disturbed areas; stabilised surfaces would be reinstated as quickly as practicable after construction; all stockpiled materials would be stored in bunded areas and away from waterways to avoid sediment-laden runoff entering the waterways; sediment would be prevented from moving offsite and sediment-laden water prevented from entering any watercourse, drainage line or drainage inlet; erosion and sediment control measures would be regularly inspected (particularly following rainfall events) to monitor their effectiveness and stability; erosion and sediment control measures would be left in place until the works are complete or areas are stabilised; 	M	Construction	Major risk of erosion of disturbed areas and contamination of local drainage systems and watercourses with sediment and other disturbed site contaminants if a soil and water management plan (or equivalent) is not implemented for the Project.	Implementation of these measures would eliminate this risk under extreme events, up to a reasonable limit as accepted in the guidelines, and would reduce this risk to low under very extreme scenarios that cannot be designed for.	●	●	●

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	<ul style="list-style-type: none"> temporary erosion control and energy dissipation measures would be installed to protect receiving environments from erosion; and vehicle movements would be managed during rainfall (or while the ground remains sodden) to minimise disturbance to the topsoil. 							
9M	Procedures to maintain acceptable water quality and to manage chemicals and hazardous materials (including spill management procedures, use of spill kits and procedures for refuelling and maintaining construction vehicles/equipment) would be implemented during construction.	M	Construction	Major risk of contamination of watercourses if hazardous materials are not protected using industry standard spill management procedures.	This risk can be eliminated using appropriate handling and storage procedures and guidelines.	●	●	●
9N	Vehicles and machinery would be properly maintained to minimise the risk of fuel/oil leaks.	M	Construction	Moderate to high risk of contamination of watercourses if fuel/oil leaks are not contained using industry standard management procedures.	This risk can be eliminated using appropriate maintenance and spill containment procedures and guidelines.	●	●	●
9O	Routine inspections of all construction vehicles and equipment would be undertaken for evidence of fuel/oil leaks.	M	Construction	Refer to 9Q above.	Refer to 9Q above.	●	●	●
9P	All fuels, chemicals and hazardous liquids would be stored within an impervious bunded area in accordance with Australian Standards and NSW Environment Protection Authority guidelines.	M	Construction	Refer to 9Q above.	Refer to 9Q above.	●	●	●
9Q	Emergency spill kits would be kept onsite at all times. All staff would be made aware of the location of the spill kits and trained in their use.	M	Construction	Refer to 9Q above.	Refer to 9Q above.	●	●	●
9S	Construction plant, vehicles and equipment would be refuelled offsite, or in designated re-fuelling areas located at least 50 metres from drainage lines or waterways.	M	Construction	Refer to 9Q above.	Refer to 9Q above.	●	●	●
9T	If landfill cells at the Glenfield Waste site are to be affected, then a detailed assessment must be prepared including targeted intrusive investigations to determine contamination pathways and to develop mitigation, management and/or remediation options based on those investigations. No works within this licensed premise without EPA's written approval.	M	Detailed design	High risk to the environment if adequate controls are not put in place.	Risk can be managed to a low level if mitigation is appropriate.	N/A	●	N/A
9U	A stormwater management plan (or equivalent) would be developed in accordance with the detailed design. This includes the requirement to control the rate of stormwater runoff so that it does not exceed the pre-developed rate of runoff.	M	Detailed design	Moderate to high risk of areas of the site and/or neighbouring land and property being subject to worse than existing case flooding.	Implementation of a stormwater management plan (or equivalent) will eliminate this risk.	●	●	●
9V	The stormwater system would be designed such that flow from low order events (up to and including the 10% AEP event from the main part of the site, and up to and including the 2% AEP event for the rail access connection corridor) would be conveyed within the formal drainage systems. Flows from rarer events (up to the 1% AEP event) would be conveyed in controlled overland flow paths.	M	Detailed design	Major risk of uncontrolled flooding exposing site users to unacceptable flood hazards and risks if these standard design guidelines are not adopted.	Designing to these standards will ensure flooding can be managed and will occur in a controlled way in line with current design guidelines.	●	N/A	●
9W	The onsite detention system proposed would detain flow and control discharge rates to the Georges River equal to pre-development discharge rates.	M	Detailed design	Refer to 9R above.	Refer to 9W above.	●	N/A	●
9X	A stormwater treatment system would be implemented, incorporating sedimentation and bio-filtration basins upstream of the stormwater detention basins.	M	Detailed design, construction, operation	Major risk of contamination of downstream drainage systems and watercourses if standard Water Sensitive Urban Design (WSUD) measures are not adopted to treat stormwater runoff from the site.	Adopting industry standard and good practice WSUD measures will eliminate this risk.	●	N/A	●

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9Y	Use of onsite infiltration would be incorporated into the design through the distribution of swale drains and rain gardens across the Project site.	M	Detailed design	Refer to 9Z above.	Refer to 9Z above.	●	N/A	●
9Z	<p>A number of other stormwater management opportunities would be considered during development of the detailed design in accordance with Liverpool City Council's Development Control Plan Part 2.4 Development in Moorebank Defence Lands and other relevant policies, including:</p> <ul style="list-style-type: none"> polishing water runoff using dry creek gravel beds with macrophyte plants; using drainage swales to slow down stormwater runoff and increase onsite infiltration; collecting roof rainwater for re-use onsite; installing gross pollutant traps (GPTs) at the outlets of the pipe system before discharge into the sedimentation basins; and incorporating impervious surfaces and vegetated areas into the design to increase sub-surface water flow during rain events and to reduce the discharge of stormwater pollutants. 	SR	Detailed design	No major implication if not adopted.	These can be considered 'value added' measures to further improve the management of stormwater across the site above and beyond industry standards.	●	N/A	●
Groundwater								
9AA	Concrete structures and other subsurface infrastructure in areas that may potentially interact with local groundwater would be constructed from sulfate resistant cement and materials.	M	Detailed design and construction	High to major risk of structural damage or failure of sub-surface structures and contamination of local groundwater system.	Adopting the recommended design would eliminate this risk or reduce it to low and within acceptable levels.	●	N/A	●
9AB	Where required, water access entitlements such as groundwater licences would be obtained for dewatering activities, in accordance with the requirements of NSW Office of Water's proposed Aquifer Interference Policy.	M	Pre-construction	Major risk of non-compliant project and construction being halted if the required licences are not in place.	Risk would be eliminated by obtaining the required licences before construction.	●	N/A	●
9AC	Groundwater quality would be tested to determine salinity levels and inform potential design measures to ensure the design life of any infrastructure is achieved.	M	Detailed design	Refer to 9AC above.	Refer to 9AC above.	●	N/A	●
9AD	Suitable groundwater monitoring where required would be established and undertaken before construction, during construction and during operation of the Project.	M	Pre-construction, construction and operation	Moderate to high risk of non-compliance with groundwater licencing and removal of construction/operation licence if monitoring data is not collected to demonstrate compliance.	This risk would be eliminated by establishing a monitoring program.	●	N/A	●
9AE	To prevent the contamination of groundwater during Project construction and operation, suitable water treatment, water retention, water proofing and ground treatments would be investigated and implemented where required.	SR	Detailed design, construction and operation	Low to moderate risk of contamination of groundwater system if required management measures are not adopted.	This risk would be eliminated through adoption of appropriate industry standard management measures.	●	N/A	●
9AF	Potential impacts on two existing groundwater bores in the vicinity of the proposal would be further investigated during detailed design. Mitigation measures to minimise these impacts would also be developed as required.	SR	Detailed design	Low to moderate risk of groundwater drawdown due to the Project reducing the yield of the existing bores.	The risk may be possible to reduce further or eliminate through appropriate design and staging of construction to minimise dewatering requirements during operation and construction phases.	●	N/A	●
9AG	<p>The following groundwater assessments would be carried out:</p> <ul style="list-style-type: none"> an overall assessment of pre-construction groundwater quality and levels; characterisation of local and regional groundwater flow systems, including the groundwater contours and flow conditions; 	M	Detailed design	Moderate to high risk of unacceptable groundwater impacts occurring if these assessments are not undertaken.	Reduction of risk to low or elimination of some risks is possible if these assessments are undertaken to improve the understanding of the vulnerability of the groundwater environment.	●	N/A	●

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	<ul style="list-style-type: none"> consideration of potential groundwater supply options, if required; assessment of impacts on groundwater levels and quality during construction and ongoing operation; confirmation of management and mitigation solutions for potential groundwater impacts; and assessment of the potential salinity impacts that may result from the Project. 							
Air quality – Construction								
10A	A Dust Management Plan (DMP) (or equivalent) would be prepared as part of the CEMP.	M	Early Works and construction	Moderate risk that air quality emissions from the Project would not be managed effectively.	Medium level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	●	●
10B	Dust minimisation measures would be developed and implemented before commencement of construction. The NSW Coal Mining Benchmarking Study: Measures to Prevent and/or Minimise Emissions of Particulate Matter from Coal Mining (OEH 2011) would be considered.	M	Early Works and construction	Moderate risk that air quality emissions from the Project would not be managed effectively.	Medium level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	●	●
10C	Methods for management of emissions would be incorporated into Project inductions, training and pre-start talks.	M	Early Works and construction	Moderate risk that air quality emissions from the Project would not be managed effectively.	Medium level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	●	●
10D	Activities with the potential to cause significant emissions, such as material delivery and load out and bulk earthworks, would be identified in the CEMP. Work practices that minimise emissions during these activities would be investigated and applied where reasonable and feasible.	M	Early Works and construction	Moderate risk that air quality emissions from the Project would not be managed effectively.	Medium level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	●	●
10E	A mechanism for raising and responding to complaints would be put in place for the duration of the construction phase.	M	Early Works and construction	High risk that community impacts would not be effectively mitigated.	Medium level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	●	●
10F	Vehicle movements would be limited to designated entries and exits, haulage routes and parking areas. Project site exits would be fitted with hardstand material, rumble grids or other appropriate measures to limit the amount of material transported offsite (where required).	M	Early Works and construction	Moderate risk that air quality emissions from the Project would not be managed effectively.	Medium level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	●	●
10G	Work site compounds and exposed areas would be screened to assist in capturing airborne particles and reduce potential entrainment of particles from areas susceptible to wind erosion.	M	Early Works and construction	Moderate risk that air quality emissions from the Project would not be managed effectively.	Medium level of effectiveness in mitigating risk (proven measure on similar projects). Emission reduction of 30% applied.	●	●	●
10H	Dust would be visually monitored during construction and the following measures would be implemented where necessary: Apply water (or alternative measures) to exposed surfaces that are causing dust generation. Surfaces may include any stockpiles, hardstand areas and other exposed surfaces (for example recently graded areas). Regular watering would ensure that the soil is moist to achieve 50% control of dust emissions from scrapers, graders and dozers. Appropriately cover loads on trucks transporting material to and from the construction site. Securely fix tailgates of road transport trucks before loading and immediately after unloading.	M	Early Works and construction	Moderate risk that air quality emissions from the Project would not be managed effectively.	Medium level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	●	●

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	Prevent, where possible, or remove, mud and dirt being tracked onto sealed road. Apply water at a rate of >2 litres (L) per square metre per hour (L/m ² /hr) to internal unsealed access roadways and work areas. Application rates would be related to atmospheric conditions (e.g. prolonged dry periods) and the intensity of construction operations. Paved roads should be regularly swept and watered when necessary.							
10I	Where reasonable and feasible, dust generating activities (particularly clearing and excavating) would be avoided or minimised during dry and windy conditions.	M	Early Works and construction	High risk that air quality emissions from the Project would not be managed effectively.	High level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	●	●
10J	Project site speed limits of 20 km/h would be imposed on all construction vehicles travelling within the Project site.	M	Early Works and construction	Moderate risk that air quality emissions from the Project would not be managed effectively.	Medium level of effectiveness in mitigating risk (proven measure on similar projects). Emission reduction associated with reduced travel speed.	●	●	●
10K	Graders would be limited to a speed of 8 km/h to reduce potential dust emissions.	M	Early Works and construction	Moderate risk that air quality emissions from the Project would not be managed effectively.	Medium level of effectiveness in mitigating risk (proven measure on similar projects). Emission reduction associated with reduced travel speed.	●	●	●
10L	Material stockpiles would not exceed an area of 1 ha and would be regularly watered to achieve 50% control of potential dust emissions.	M	Early Works and construction	Moderate risk that air quality emissions from the Project would not be managed effectively.	High level of effectiveness in mitigating risk (proven measure on similar projects). Emission reduction of 50% applied.	●	●	●
10M	Exposed areas and stockpiles would be limited in area and duration. For example, vegetation stripping or grading would be staged where possible, unconsolidated stockpiles would be covered, or hydro mulch or other revegetation applicant applied to stockpiles or surfaces left standing for extended periods.	M	Early Works and construction	High risk that air quality emissions from the Project would not be managed effectively.	High level of effectiveness in mitigating risk (proven measure on similar projects). Emissions estimated based on size of exposed areas.	●	●	●
10N	Revegetation or rehabilitation activities would proceed once construction activities were completed within a disturbed area.	M	Early Works and construction	High risk that air quality emissions from the Project would not be managed effectively.	High level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	●	●
10O	Construction plant and equipment would be well maintained and regularly serviced so that vehicular emissions remain within relevant air quality guidelines and standards.	M	Early Works and construction	Moderate risk that air quality emissions from the Project would not be managed effectively.	High level of effectiveness in mitigating risk (proven measure on similar projects). Emissions based on maintaining engine standards.	●	●	●
10P	Excavation works in potentially contaminated soils should be managed to ensure that they are completed during optimal dispersive conditions to minimise odorous emissions.	M	Early Works and construction	Low risk that air quality emissions from the Project would not be managed effectively.	Medium level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	●	●
10Q	Emissions from trucks would be regulated in accordance with the requirements prescribed in the National Environmental Protection Measure (NEPM) (Diesel Vehicle Emissions) (NEPC 2001) or suitably relevant standards.	M	Early Works and construction	Moderate risk that air quality emissions from the Project would not be managed effectively.	High level of effectiveness in mitigating risk (proven measure on similar projects). Emissions based on maintaining engine standards.	●	●	●

No.	Mitigation measure	Mandatory (M)/subject to review (SR)	Implementation phase	Predicted risk/outcome if measure not implemented (i.e. reason for proposed measure)	Predicted effectiveness of measure(s) or outcome relative to unmitigated condition	Applicability		
						IMT site	Southern rail access connection	Warehousing
10R	All construction vehicles would be tuned to avoid releasing excessive smoke from the exhaust and would be compliant with OEH Smokey Vehicles Program under the NSW <i>Protection of the Environment and Operations Act 1997</i> (POEO Act) and <i>POEO Regulations</i> (NSW) (2010).	M	Early Works and construction	Moderate risk that air quality emissions from the Project would not be managed effectively.	Medium level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	●	●
10S	All on-road trucks are to comply with the Euro V emission standards or suitably relevant standards.	M	Early Works and construction	Moderate risk that air quality emissions from the Project would not be managed effectively.	High level of effectiveness in mitigating risk (proven measure on similar projects). Emissions based on maintaining engine standards.	●	●	●
10T	All new off-road construction equipment would be required to meet, at minimum, the US Environmental Protection Agency (EPA) Tier 3 emission standards (or suitably relevant standards) for non-road diesel engines.	M	Early Works and construction	Moderate risk that air quality emissions from the Project would not be managed effectively.	High level of effectiveness in mitigating risk (proven measure on similar projects). Emissions based on maintaining engine standards.	●	●	●
10U	Establishment of Action Response Levels (ARLs) for use with real-time dust management. These aid in the assessment of impact potential, and establish an early warning system during adverse trends, reducing complaint potential and non-compliance issues. An ARL trigger would be a defined measurement of elevated dust levels for a prolonged period.	M	Early Works and construction	Moderate risk that air quality emissions from the Project would not be managed effectively.	High level of effectiveness in mitigating risk (proven measure on similar projects). Emissions based on maintaining engine standards.	●	●	●
Air Quality – Operation								
10V	An air quality management plan (AQMP) (or equivalent) would be prepared for the operation of the Project.	M	Pre-operation	Moderate risk that air quality emissions from the Project would not be managed effectively.	Medium level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/ appropriate to quantify.	●	●	●
10W	Manage Project site traffic to minimise the possibility of trucks queueing along public roads adjacent to the Project site. This can be achieved through the implementation and enforcement of an idling limit for trucks on site and provision for a troubled truck parking area.	M	Operation	Moderate risk that air quality emissions from the Project would not be managed effectively.	Medium level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/ appropriate to quantify.	●	N/A	●
10X	Investigate the possibility of reducing locomotives' idling times on site.	SR	Pre-operation	Low risk that air quality emissions from the Project would not be managed effectively.	Potential for emission reductions from locomotives should reduce idling time be applied. Not possible/appropriate to quantify.	●	N/A	N/A
10Y	Optimise the use of trucks capable of transporting multiple TEU containers simultaneously to achieve maximum efficiency onsite and reduce air emissions.	M	Operation	Moderate risk that air quality emissions from the Project would not be managed effectively.	High level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	N/A	N/A
10Z	Vehicles would be maintained to not release excessive levels of smoke from the exhaust and to be compliant with OEH's Smokey Vehicles Program under the POEO Act and POEO Regulations.	M	Operation	Moderate risk that air quality emissions from the Project would not be managed effectively.	Medium level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	N/A	●
10AA	Emissions from the operators' trucks would be regulated by the NEPM (Diesel Vehicle Emissions) (NEPC 2001).	M	Operation	High risk that regulatory requirements would not be met.	High level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	N/A	

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10AB	Emissions from locomotives would follow international standards, such as those provided for under United States legislation 'Final Rule: Control of Emissions of Air Pollution from Locomotives and Marine Compression-Ignition Engines Less Than 30 Litres per Cylinder' (US EPA 2012) and should meet the Tier 2+ or above emission standard for all new locomotives entering the Project site (No emission standards are available under the NSW or Federal legislative framework for locomotives).	SR	Operation	Moderate risk that air quality emissions from the Project would not be managed effectively.	High level of effectiveness in mitigating risk (proven measure on similar projects). Emissions based on maintaining engine standards.	●	●	N/A
10AC	Emissions from shunting engines would follow international standards, such as those provided for under United States legislation 'Final Rule: Control of Emissions of Air Pollution from Locomotives and Marine Compression-Ignition Engines Less Than 30 Litres per Cylinder' (US EPA 2012) and should meet the Tier 2+ or above emission standard. Older locomotives should upgraded to meet Tier 1 or Tier 2+ emission standards where reasonable and feasible. (No emission standards are available under the NSW or Federal legislative framework for shunting engines).	SR	Operation	Moderate risk that air quality emissions from the Project would not be managed effectively.	High level of effectiveness in mitigating risk (proven measure on similar projects). Emissions based on maintaining engine standards.	●	●	N/A
Cleaner fuel technology								
10AD	During detailed design the following measures would be further investigated <ul style="list-style-type: none"> electrically powered refrigerated on site containers; site only cars to be hybrid (electric/liquefied natural gas (LNG)/compressed natural gas (CNG), liquefied petroleum gas (LPG)); older diesel trucks be installed with the latest emission reduction technology, where allowed (e.g. retrofitting of particle filters, installation of catalytic convertors or replacement with newer, less polluting diesel engines to ensure emissions requirements conform to the Australian Design Rule ADR80/03); requiring all on-road trucks to comply with the Euro V emission standards; all new off-road construction equipment to meet, at minimum, the US EPA Tier 3 emission standards for non-road diesel engines (US EPA Tier 4 emission standard equipment should be adopted where available); use of hybrid locomotives or cleaner fuels for locomotives (e.g. locomotives powered by batteries with a small diesel engine for recharging the batteries and for additional power (as currently used on the Burlington Northern Santa Fe railway, California, USA)); and use of fuel cells, LNG and electric powered locomotives. 	SR	Detailed design	Moderate risk that additional improvements to the reduction of air quality emissions would not be achieved.	Effectiveness would depend on the type of measures implemented. Not possible/appropriate to quantify.	●	●	●
Strategic planning and management								
10AE	The following proposals would be considered as part of an effective and integrated strategic management plan: <ul style="list-style-type: none"> investigation of the feasibility of increasing the proportion of container traffic that moves by rail; implementation of terminal appointment systems and appropriate time slots for Project site access for truck and rail deliveries to avoid unnecessary onsite air emissions during peak periods; minimisation of the potential for fluctuating demand forecasts for equipment among carriers, railways and the terminal through effective communication; 	SR	Detailed design	Moderate risk that air quality emissions from the Project would not be managed effectively.	Effectiveness will depend on the type of measures implemented. Not possible/appropriate to quantify.	●	●	N/A

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	<ul style="list-style-type: none">utilisation of the latest information technologies such as Intelligent Transportation Systems (ITS) applied to transportation operations which can result in improved transportation efficiency and a reduced environmental impact; anduse of a virtual container yard to assist with incorporating onsite operational efficiencies to ensure air emissions are minimised.							
Miscellaneous emissions								
10AF	<p>The following measures would be further investigated at detailed design stage:</p> <ul style="list-style-type: none">All chemicals and fuels would be stored in sealed containers as per appropriate regulations and guidelines.The onsite storage of fuel would be kept to a minimum to minimise vapour emission levels.Unloading of fuels (diesel or liquefied natural gas) would be vented via return hoses that recirculate vapours from delivery to receiver.Tanks would be fitted with a conservation vent (to prevent air inflow and vapour escape until a pre-set vacuum or pressure develops).Strategies would be put in place to reduce the usage of chemical and fuels in addition to using alternative fuel technologies as recommended in the NSW Action for Air (DECCW 2009). Particular focus would be on those products with the potential to release high levels of air toxics.	SR	Detailed design	Low risk that emissions from the Project would not be managed effectively.	High level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	N/A	●
Odour								
10AG	<p>Odour emissions would be controlled through the implementation of best management practice (BMP). The following mitigation measures and safeguards are recommended for the operational works:</p> <ul style="list-style-type: none">providing covering for inlet works;extraction of inlet works foul air gases to a soil bed filter for treatment; andcontingencies in place for potential loss of aeration (backup generator for power supply and storage of lime for dosing to the process units in the event that anaerobic conditions occur).	M (implementation of BMP) SR (measures and safeguards)	Detailed design and operation	Moderate risk that emissions from the Project would not be managed effectively.	Effectiveness will depend on the type of measures implemented. Not possible/appropriate to quantify.	●	●	●
Future monitoring								
10AH	<p>It is also proposed that ambient air quality monitoring be undertaken as part of the Project's construction phase right through to operation. This would include:</p> <ul style="list-style-type: none">onsite monthly dust deposition monitoring during construction to measure dust fallout from the Project at boundary points and selected sensitive receiver locations. This would include comparison of concentrations with the air quality criteria; andannualised average monitoring after operations commence to ensure that the ambient air quality criteria are met.	M	Construction and operation	High risk that community and regulatory expectations would not be managed effectively.	High level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	●	●
Greenhouse gases (GHG)								
11A	Where possible, establish and maintain areas of native flora and vegetation within the Project site to generate significant carbon sequestration benefits.	M	Early Works, construction and operation	High risk of GHG emissions not being effectively managed	High level of effectiveness in mitigating risk. Not possible/appropriate to quantify.	●	N/A	N/A

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11B	Where possible, implement the use of biofuels (e.g. biodiesel, ethanol, or blends such as E10 and B880) to reduce GHG emissions from plant and equipment.	SR	Early Works, construction and operation	High risk of an increase in GHG emissions.	High level of effectiveness in mitigating risk. Not possible/appropriate to quantify.	●	N/A	●
11C	Consider the use of vehicles with minimum GHG emissions ratings of 7.5 for passenger vehicles and 6 for light commercial vehicles, as described in the Green Vehicle Guide (http://www.greenvehicleguide.gov.au/GVGPublicUI/home.aspx).	SR	Early Works, construction and operation	As per measure 11A.	High level of effectiveness in mitigating risk. Not possible/appropriate to quantify.	●	N/A	●
11D	Energy-efficient guidelines for operational work, such as minimal idling time for machinery or complete shut off, would be considered and implemented where appropriate.	SR	Operation	High risk of GHG emissions not being effectively managed.	High level of effectiveness in mitigating risk. Not possible/appropriate to quantify.	●	N/A	●
11E	Establish an Environmental Management System (EMS) that involves regular monitoring, auditing and reporting on energy, resource use and GHG emissions from all relevant activities; include energy audits with a view to progressively improving energy efficiency and investigation of renewable energy sources (e.g. onsite solar generation), where feasible.	M	Operation	As per measure 11A.	High level of effectiveness in mitigating risk. Not possible/appropriate to quantify.	●	●	●
11F	Investigate methods to reduce losses from industrial processes (refrigerants and SF6).	M	Operation	As per measure 11A.	High level of effectiveness in mitigating risk. Not possible/appropriate to quantify.	●	N/A	●
11G	Investigate and, where possible, implement key performance indicators (KPIs) for plant efficiency and GHG intensity.	M	Operation	As per measure 11A.	High level of effectiveness in mitigating risk. Not possible/appropriate to quantify.	●	N/A	●
11H	Consider and implement, where possible, the mitigation options for further reducing energy and GHG emissions detailed in Table 9.4 in Chapter 9 – <i>Project sustainability</i> .	SR	Detailed design, construction and operation	As per measure 11A.	High level of effectiveness in mitigating risk. Not possible/appropriate to quantify.	●	●	●
Aboriginal heritage								
12A	Where reasonable and feasible, options would be explored to conserve moderate to high significance sites in situ.	SR	Detailed design and Early Works	High risk that the Project would destroy parts or all of moderate to high significance sites.	High level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	●	●
12B	An Aboriginal heritage interpretation strategy for the Project would be developed in close consultation with the registered Aboriginal parties.	M	Detailed design and Early Works	High risk that the Project would impact area of intangible values.	Moderate level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	●	●
12C	Options for managing impacts at sites MA6 and MA7 would be explored during the detailed design phase in consultation with registered Aboriginal parties (RAP). If the scars are considered to be of Aboriginal origin, possible management options include: <ul style="list-style-type: none"> Conservation of the tree(s) in situ. This would involve designing the project to ensure that the tree(s) would not be impacted. Salvage and conservation of the tree(s), or the scarred portion of the tree's trunk, at a location outside the project area. In the event there is not a consensus of views among all of the RAPs, it is recommended that a precautionary approach be taken. This would involve acting upon statements of the tree(s) holding cultural value, even if only a minority of RAPs view either or both trees as holding cultural value.	SR	Detailed design and Early Works	Critical risk that the Project would destroy parts of or all of these sites	Avoidance has a high level of effectiveness in mitigating risk (proven measure on similar projects). Further investigations would have a moderate level of effectiveness of mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	N/A	●

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12D	An archaeological salvage excavation program would be implemented to preserve archaeological deposits of moderate to high archaeological/scientific significance located within the construction footprint (items recorded at MA5 and MA9). Consideration would be given to conserving both sites in situ, within open space reserves, or as an extension of the proposed conservation zone.	M (salvage program) SR (details of conservation)	Detailed design and Early Works	Critical risk that the Project would destroy parts or all of these sites.	The salvage program would have a moderate level of effectiveness in mitigating risk (proven measure on similar projects). Conservation will have a high level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	N/A	●
12E	A surface salvage program would be carried out to conserve surface artefacts located within the construction footprint (items recorded at MA1, MA2, MA3 and MA4). Salvage of surface artefacts would be undertaken before any impacts in these areas.	M	Detailed design and Early Works	Critical risk that the Project would destroy parts or all of these sites.	The salvage program will have a moderate level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	N/A	●
12F	The Unanticipated Discoveries Protocol described in Appendix 10 of Technical Paper 10 – Aboriginal Heritage Impact Assessment in Volume 7 of the EIS, would be followed in the event that historical items or relics or suspected burials are encountered during construction works.	M	Construction	Moderate risk that the Project would affect unknown sites.	Moderate level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	●	●
12G	Consultation would be ongoing with the registered Aboriginal parties during construction of the Project and would include: <ul style="list-style-type: none"> consultation on the future care and management of recovered Aboriginal objects; methodologies for any future investigations; and finalisation of management and mitigation strategies subject to detailed design. 	M	Construction	High risk that the Project would not comply with consultation guidelines and that the views and wishes of RAPs would not to be taken into consideration in future stages.	High level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	●	●
European heritage								
13A	Road names within the School of Military Engineering (SME) would be retained where possible.	SR	Detailed design	High risk that the Project would affect areas of intangible values.	Moderate level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	N/A	●
13B	Continued commemoration of significant events and individuals would be considered through the naming of buildings, streets and the rail bridge proposed for construction as part of the Project.	SR	Detailed design	High risk that the Project would affect areas of intangible values.	Moderate level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	●	●
13C	Where reasonable and feasible options exist for avoiding impacts on one or more identified heritage items, preference would be given to conserving items of Commonwealth or State significance.	M	Detailed design	High risk that the Project would destroy parts of or all items of Commonwealth or State significance.	High level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	●	●
13D	Where avoidance of impacts on a heritage item is not reasonable or feasible, mitigation works inclusive of archival recordings, salvage of archaeological deposits, relocation of significant elements of the built environment and/or adaptive reuse would be undertaken.	M	Early Works	Critical risk that the Project would destroy parts or all of these sites.	Moderate level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	●	●
13E	A European heritage interpretation strategy would be developed in close consultation with local historical societies, former and current staff and military personnel.	M	Early Works	High risk that the Project would affect areas of intangible values.	Moderate level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	●	●

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13F	No impacts would occur within the potential archaeological deposits (PAD) boundaries of Moorebank Historical Potential Archaeological Deposit (MHPAD) 1 and MHPAD2 without prior archaeological salvage, as these sites contain archaeological deposits, inclusive of in-situ building remains, that are assessed to be of local significance in the context of the history of military housing and training at Moorebank.	M	Early Works	Critical risk that the Project would destroy parts or all of these sites.	Moderate level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	N/A	●
13G	In addition to archival recording of the Transport Compound Workshop (B99), consideration would be given during the detailed design stage to the in-situ conservation or adaptive reuse of this structure within the Project site. This would assist with mitigation of heritage impacts on the structure itself and the Moorebank Cultural Landscape as a whole.	SR	Early Works	Critical risk that the Project would destroy parts or all of these sites.	Conservation will have a High level of effectiveness in mitigating risk (proven measure on similar projects). Adaptive reuse will have a moderate level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	N/A	N/A
13H	In addition to archival recording, the Dog Cemetery (MH1) would be repositioned and the individual graves reinterred. This would be carried out in accordance with the wishes of the SME's Explosive Detection Dogs unit and respecting the social value of the site.	SR	Early Works	Critical risk that the Project would destroy parts or all of these sites.	Moderate level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	N/A	●
13I	In addition to archival recording, consideration would be given during detailed design to the in-situ conservation of the Commemorative Garden (MH6). If in situ conservation is not possible, the plaques and planting should be relocated to an alternative location on public display within the Project.	SR	Early Works	Critical risk that the Project would destroy parts or all of these sites.	Conservation will have a high level of effectiveness in mitigating risk (proven measure on similar projects). Relocation will have a moderate level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	N/A	●
13J	For the southern rail access, heritage item Railway viaduct, Main Southern Railway Line (Item 12) should be noted on all plans and maps during construction and all care taken to avoid this item.	SR	Detailed design and construction	Critical risk that the Project would destroy parts or all of these sites.	Highly effective in mitigating risk.	N/A	●	N/A
13K	The Unanticipated Discoveries Protocol (detailed in Appendix 7 of Technical Paper 11 – European Heritage Impact Assessment in Volume 8) would be followed in the event that historical items or relics or suspected burials are encountered during excavation works.	M	Early Works and construction	Moderate risk that the Project would affect unknown sites.	Moderate level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	●	●
13L	The Unanticipated Discoveries Protocol (detailed in Appendix 7 of Technical Paper 11 – European Heritage Impact Assessment in Volume 8) would be followed in the event that historical maritime items or relics are encountered during bridge works within the Georges River.	M	Early Works and construction	Moderate risk that the Project would affect unknown sites.	Moderate level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	N/A	●	N/A
13M	Further consideration would be given to options for the retention and/or relocation and adaptive reuse of the CUST Hut and the RAAF STRARCH Hangar to mitigate impacts on heritage values associated with these structures and to broaden their cultural landscape. Options considered for mitigation in order of preference are: <ul style="list-style-type: none"> Relocation (either offsite or onsite) and conserve/adaptive reuse – this would be investigated further as part of the detailed design and any future development applications. Interpretive commemoration utilising materials/elements from the building – this may be required but would be determined by the findings from investigations in option 1 above. Demolition may be required but would be determined by the findings from investigations in option 1 above. 	SR	Detailed design and Early Works	Critical risk that the Project would destroy parts or whole of these sites.	Moderate level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	N/A	●

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						IMT site	Southern rail access connection	Warehousing
	<ul style="list-style-type: none">The first preference would be to retain and adaptively re-use these items on the redeveloped Project site (within the precinct but outside the secure area, as part of the administrative facilities or similar). If this is not feasible or practicable, the second preference would be for relocation to another appropriate location, potentially with adaptive reuse.							
Visual and urban design								
14A	<p>Visual mitigation measures to be considered during the detailed design of the Project include:</p> <ul style="list-style-type: none">avoiding clearing of the conservation area which currently obscures and filters views into the Project site;enhancing existing native vegetation adjoining the Georges River;enhancing existing native trees with extended and consolidated planting; andconserve the natural character and streetscape along Moorebank Avenue and allow for effective landscaping.	SR	Detailed design	High risk that visual amenity would be severely affected surrounding the Project site.	High level of effectiveness.	●	●	●
14B	<p>The following additional visual mitigation measures would be considered during detailed design:</p> <ul style="list-style-type: none">Consider the siting of development to minimise vegetation clearing.Consider options for permeable tree planting adjoining buildings to reduce visual impacts and to cast shadows.Enhance vegetation adjoining water bodies.Maximise integration of the terminal facilities and the associated warehousing precinct by providing vegetation screening, way-finding throughout the Project site, breakout space for the public and staff, and visual relief.Provide additional native trees to the car park areas to maximise the opportunity for shade and to provide a landscape frontage that is scaled to complement the new buildings.Provide landscaping along Moorebank Avenue, including extensive tree and shrub planting on road frontages that provides visual relief from the industrial appearance of the warehousing, with a layered approach along the streetscape.Consider localised earth mounding and native canopy tree planting to internal landscape areas on the western side of the new buildings to mitigate visual impacts on residential areas.Choose finishes and materials that limit contrast with the surrounding landscape, with the preferred use of muted colours.Take opportunities to start early rehabilitation and supplementary planting of endemic species to the conservation area on the western boundary.Consider options for tree planting adjacent to buildings, to reduce visual impacts (while also considering any required security constraints and rail line fell distances).Consider the building design further during the detailed design process and be consistent with controls outlined in the Liverpool Development Control Plan 2008, Part 7 Development in Industrial Areas (LCC 2008c), including facade treatment, materials, building design and lighting.	SR	Detailed design	High risk that visual amenity would be severely affected from locations around and within the site, especially along Moorebank Avenue.	High level of effectiveness if implemented at the detailed design stage. Good urban design principles will assist in reducing visual impact.	●	●	●

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Light spill measures								
14C	Lighting required during construction of the Project would be designed and located to minimise the effects of light spill on surrounding sensitive receivers, including residential areas and the proposed conservation area.	M	Construction	High level of risk that some sensitive receivers would be impacted unnecessarily.	High level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	●	●
14D	Design lighting to minimise impacts on surrounding existing and future residents and the proposed conservation zone.	M	Detailed design	High level of risk that some sensitive receivers would be affected.	High level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	N/A	●
14E	Consider use of shields on luminaire lighting to minimise brightness effects.	SR	Detailed design	Providing item 14G is achieved the risk to some sensitive receivers would be moderate. If item 14G is not achieved the risk would be major.	Providing item 14G is achieved there is a high level of effectiveness in mitigating risk (proven measure on similar projects). If item 14G is not achieved there is a low level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	●	●
14F	Select asymmetric light distribution-type floodlights as part of the proposed lighting design (which means the light is directed specifically to the task with minimal direct light spill to the surrounding area).	M	Detailed design	Major risk that sensitive receivers and the environment would be affected.	High level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	N/A	●
14G	Consider low reflection pavement surfaces to reduce brightness.	SR	Detailed design	High level of risk that sensitive receivers, particularly residents in Casula, would be affected.	High level of effectiveness in mitigating risk (proven measure on similar projects). Not possible/appropriate to quantify.	●	N/A	●
14H	Minimise the quantity of light and energy consumption in parts of the Project site that are not active, while retaining safe operation.	M	Detailed design	High level of risk that there would be unnecessary energy usage and higher light spill impacts.	High level of effectiveness in mitigating risk (proven measure on similar projects). Energy consumption could be reduced by up to one-third for inactive areas of the site.	●	N/A	●
Property and infrastructure								
15A	Undertake further investigations into the location of existing utilities and the likely impact on these utilities. This would include consultation with asset owners to determine the appropriate measures for relocation.	M (undertake consultation and investigation) SR (details of measures)	Detailed design	High level of risk that relevant asset owners will not be consulted.	High level of effectiveness in mitigating risk. Not possible/appropriate to quantify.	●	●	●
15B	Implement ‘dial before you dig’ protocols for all potential utilities affected by the Project.	M	Early Works and construction	High level of risk that not all affected utilities are identified.	High level of effectiveness in mitigating risk. Not possible/appropriate to quantify	●	N/A	●
Social and economic impacts								
16A	A Project contact phone number and website would be maintained during construction and operation to enable the community, including local business owners and/or operators, to access information on the Project and receive responses to any concerns.	M	Early Works and construction and operation	Moderate level of risk that affected residents and business owners are not consulted during key stages of the Project.	High level of effectiveness in mitigating risk.	●	●	●
16B	A complaints line and resolution process would be set up and maintained.	M	Early Works, construction and operation	High level of risk that complaints are not dealt with and resolved quickly and effectively.	High level of effectiveness in mitigating risk.	●	●	●

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						IMT site	Southern rail access connection	Warehousing
Human health risks and impacts								
17A	Annualised average monitoring for air quality and noise would be regularly reviewed against the guidelines developed in the specialist studies supporting this EIS, as they are based on protecting the health of the community. Should exceedances be identified in these key indicators as a result of the Project, then a further and more targeted monitoring and management program would be developed as required.	M	Construction and operation	Potential for moderate impacts if elevated exposures to air emission, noise and traffic if not adequately monitored and managed. May result in adverse health effects and/or increased levels of stress in the local community.	Medium to high effectiveness based on range of mitigation measures proposed.	●	●	●
Waste management – Construction								
18A	A construction waste management plan (or equivalent) would be prepared as part of the overall CEMP. This would implement key principles of relevant waste guidelines, and the waste management hierarchy of reduction, reuse, recycling and recovery.	M	Early Works and construction	High level of risk that waste guidelines are not implemented effectively.	High level of effectiveness in mitigating risk.	●	●	●
18B	The waste hierarchy would be investigated and implemented where possible with avoidance of waste, re-use and recycling incorporated into construction methodologies.	SR	Early Works and construction	High risk that waste is not avoided, reduced or minimised throughout construction.	High level of effectiveness in mitigating risk.	●	●	●
18C	Consideration would be given to the selection of materials for use in construction to minimise waste generated throughout their lifecycle.	SR	Early Works and construction	Moderate level of risk that best practice recycling methods with a high sustainability rating are not used.	High level of effectiveness in mitigating risk.	●	●	●
18D	Where practicable, construction materials that contain minimal embodied energy would be preferred.	SR	Early Works and construction	Moderate risk of using construction materials made from high energy intensive methods.	High level of effectiveness in mitigating risk.	●	●	●
18E	Opportunities would be explored where practicable to recycle or re-use materials arising from demolition works, with a preference for onsite re-use where possible (or recycling through an appropriate recycling contractor).	SR	Early Works and construction	High risk that waste is not avoided, reduced or minimised throughout construction.	High level of effectiveness in mitigating risk.	●	●	●
18F	Where possible, site disturbance and unnecessary excavation would be minimised.	SR	Early Works and construction	High risk of ground disturbance.	High level of effectiveness in mitigating risk.	●	●	●
18G	Formwork would be re-used where possible.	SR	Early Works and construction	High risk that materials from the construction phase are not recycled or disposed appropriately.	High level of effectiveness in mitigating risk.	●	●	●
18H	Sewage waste would be disposed of by a licensed waste contractor in accordance with Sydney Water and OEH requirements.	M	Early Works and construction	High level of risk that waste is not disposed of correctly.	High level of effectiveness in mitigating risk.	●	●	●
Waste management – operational waste								
18I	A waste management plan (or equivalent) would be prepared and implemented to govern the overall use of materials, categorisation of wastes, and re-use and recycling process.	M	Operation	High level of risk that waste guidelines are not implemented effectively.	High level of effectiveness in mitigating risk.	●	●	●
18J	The waste hierarchy would be investigated and implemented where possible with avoidance of waste, re-use and recycling incorporated into the design, purchasing and procurement.	SR	Operation	High risk that waste is not avoided, reduced or minimised throughout operation.	High level of effectiveness in mitigating risk.	●	N/A	●
18K	Consideration would be given to the selection of materials for use in operation to minimise waste generated throughout their lifecycle.	SR	Operation	Moderate level of risk that best practice recycling methods with a high sustainability rating are not used.	High level of effectiveness in mitigating risk.	●	N/A	●
18L	Materials used onsite would be recycled where possible, including steel, batteries, electronics and paper.	SR	Operation	High risk that waste is not avoided, reduced or minimised throughout operation.	High level of effectiveness in mitigating risk.	●	N/A	●

No.	Mitigation measure	Mandatory (M)/subject to review (SR)	Implementation phase	Predicted risk/outcome if measure not implemented (i.e. reason for proposed measure)	Predicted effectiveness of measure(s) or outcome relative to unmitigated condition	Applicability		
						IMT site	Southern rail access connection	Warehousing
18M	Future recovery of waste would be encouraged through site design, including provision for storage areas and appropriate paths for waste containers.	SR	Operation	High risk that waste is not avoided, reduced or minimised throughout operation.	High level of effectiveness in mitigating risk.	●	N/A	●
18N	Dedicated recycling storage areas and recycling bins would be located throughout the Project site, with clear signage and convenient access for waste recycling service providers. This would include bins for paper, plastics, glass, metals and compost.	SR	Operation	High risk of contamination if waste is not effectively managed.	High level of effectiveness in mitigating risk.	●	N/A	●
18O	Where required, separate bunded storage area would be established for liquid wastes (e.g. oils), along with drainage to grease trap if required.	SR	Operation	High risk of contamination if liquid wastes are not appropriately stored.	High level of effectiveness in mitigating risk.	●	N/A	●
18P	A waste management system would be developed to include calculations of anticipated waste volumes from the office, landscaped areas, refuelling facilities and warehousing and distribution activities for ongoing comparison and monitoring.	SR	Operation			●	N/A	●
18Q	Onsite waste management infrastructure would, as a minimum, cater for the following three waste streams: <ul style="list-style-type: none"> recovered waste (for re-use or recycling); residual waste (for disposal or alternative waste technology); and hazardous waste (wastes that are toxic, corrosive, flammable, explosive or reactive). 	SR	Operation	High risk of contamination if waste streams are not effectively managed.	High level of effectiveness in mitigating risk	●	N/A	●
18R	Water efficient fixtures and fittings would be installed wherever possible, including in all basins, wash down areas and offices and general amenities areas.	SR	Operation	Moderate risk of water wastage.	High level of effectiveness in mitigating risk.	●	N/A	●
18S	Where possible, rainwater harvesting and surface water runoff management would be utilised for watering of gardens and landscaping.	SR	Operation	Moderate risk of water wastage.	High level of effectiveness in mitigating risk.	●	N/A	●
18T	The use of grey water and black water recycling would be investigated. Recycling water would most likely be used for toilet flushing and/or landscape irrigation. If used, it would comply with the relevant guidelines and agency approval.	SR	Operation	Moderate risk of water wastage.	High level of effectiveness in mitigating risk.	●	N/A	●
18U	Where possible, fire test water from the Project site would be collected for re-use. Washdown water from vehicle and train washdown facilities (if required) would also be collected for re-use.	SR	Operation	Moderate risk of water wastage.	High level of effectiveness in mitigating risk.	●	N/A	●
18V	Where reasonable and feasible, water meters would be installed on all major water uses (air conditioning cooling towers, irrigation, domestic hot water, amenities, washdown, rainwater collection and recycled water system).	SR	Operation	Moderate risk of water wastage.	High level of effectiveness in mitigating risk.	●	N/A	●
18W	Water reduction targets would be considered for office areas, in line with the National Australian Built Environment Rating System (NABERS) Water protocol for office buildings (refer discussion in Chapter 9 – <i>Project sustainability</i>).	SR	Operation	Moderate risk of water wastage.	High level of effectiveness in mitigating risk.	●	N/A	●
Use of resources – construction								
18X	Opportunities to utilise recycled building materials in the overall structure of the Project would be explored. Development of the design would seek to use construction materials that have been made with a post-consumer recycled content of 50% or greater. Table 9.4 in Chapter 9 – <i>Project sustainability</i> identifies other initiatives to minimise the use of materials and, where possible, use recycled materials.	SR	Detailed design and operation	Moderate to high risk of resource waste.	High level of effectiveness in mitigating risk.	●	●	●

No.	Mitigation measure	Mandatory (M)/subject to review (SR)	Implementation phase	Predicted risk/outcome if measure not implemented (i.e. reason for proposed measure)	Predicted effectiveness of measure(s) or outcome relative to unmitigated condition	Applicability		
						IMT site	Southern rail access connection	Warehousing
18Y	Measures to minimise the use of energy and fuel would be investigated and implemented where appropriate. These may include using non-renewable sources such as petroleum, diesel, natural gas and liquefied natural gas.	SR	Early Works, detailed design and construction	Moderate to high risk of resource waste.	High level of effectiveness in mitigating risk.	●	●	●
18Z	Where practicable, water would be re-used onsite, including water stored in sediment basins.	SR	Early Works, detailed design and construction	Moderate to high risk of water waste.	High level of effectiveness in mitigating risk.	●	●	●
Use of resources – operation								
18AA	Initiatives in Table 9.4 in Chapter 9 – <i>Project sustainability</i> would be considered and implemented where practicable to minimise the use of energy and fuel during the operation of the Project.	SR	Detailed design and operation	Moderate to high risk of resource use.	High level of effectiveness in mitigating risk.	●	●	●
Cumulative traffic impacts								
19A	The intersection treatments and delivery timing for all cumulative scenarios are presented in Table 7.37 of the Response to Submission report; a number of these treatments would be required for a Moorebank project only scenario by 2030.	SR	Detailed design and operation	High risk of significant traffic congestion (deterioration of LoS of key intersections)	Moderate to high level of effectiveness in mitigating risk	●	N/A	N/A
Cumulative air and noise								
19B	The design and implementation of air quality and noise mitigation would need to be determined for the final staged operations during the detailed design phase and, as required, be included in the environmental assessment for the Stage 2 SSD approval(s).	SR	Detailed design and operation	High risk of air and noise emissions not being effectively managed.	High level of effectiveness in mitigating risk.	●	N/A	●