



APPENDIX E – ENVIRONMENTAL RISK ASSESSMENT AND MITIGATION MEASURES

The following section provides recommendation for mitigation measures in response to potential impacts identified in **Section 6** of the EIS. The structure of mitigation measures is based on the Department of Planning, Housing and Industry’s (DPHI) hierarchy of approaches for managing impacts identified in the *Draft Environmental Impact Assessment Guidance Series* released by DPHI in June 2017, as:

- **Performance based measure** – identify performance criteria that must be complied with to achieve an appropriate environmental outcome but do not specify how the outcome is to be achieved.
- **Prescriptive measure** – require action to be taken or specify something that must not be done.
- **Management based measure** – identify one or more management objectives that must be achieved through the implementation of a management plan.

Following the implementation of appropriate mitigation measures as recommended, it is determined that the proposal will not result in any significant adverse impacts on the surrounding environment. The following table illustrates how the matters raised within the SEARs will be addressed.

This analysis comprises a qualitative assessment consistent with AS/NZS ISO 31000:2009 *Risk Management–Principles and Guidelines* (Standards Australia 2009). The level of risk was assessed by considering the potential impacts of the proposed development prior to application of any mitigation or management measures. In accordance with the SEARs, the Environmental Risk Assessment (ERA) addresses the following significant risk issues:

- The adequacy of baseline data;
- The potential cumulative impacts arising from other developments in the vicinity of the site; and
- Measures to avoid, minimise, offset the predicted impacts where necessary involving the preparation of detailed contingency plans for managing any significant risk to the environment.

Risk comprises the likelihood of an event occurring and the consequences of that event. For the proposal, the following descriptors were adopted for ‘likelihood’ and ‘consequence’.

Likelihood		Consequence	
A	Almost certain	1	Widespread and/or irreversible impact
B	Likely	2	Extensive but reversible (within 2 years) impact or irreversible local impact
C	Possible	3	Local, acceptable or reversible impact

D	Unlikely	4	Local, reversible, short term (<3 months) impact
E	Rare	5	Local, reversible, short term (<1 month) impact

The risk levels for likely and potential impacts were derived using the following risk matrix.

		LIKELIHOOD				
		A	B	C	D	E
CONSEQUENCE	1	High	High	Medium	Low	Very low
	2	High	High	Medium	Low	Very low
	3	Medium	Medium	Medium	Low	Very low
	4	Low	Low	Low	Low	Very low
	5	Very low	Very low	Very low	Very low	Very low

The results of the environmental risk assessment for the proposed development are presented in the below table and are based upon the range of technical and specialist consultant reports appended to the EIS. The table has directly related mitigation measures responding to each impact also based upon the range of technical and specialist consultant reports appended to the EIS.

N.B. 'O' – Operational; 'C' – Construction

'Pe' – Performance based mitigation measure; 'Pr' – Prescriptive based mitigation measure 'Ma' – Management based mitigation measure

SEARS	Potential Impact	Stage of Project	Likelihood	Consequence	Risk Level	Approach	Mitigation Measure (Pe/Pr/Ma)	Residual Impact
Visual Impact	Visual amenity impacts which detract from the local character.	C & O	D	3	Low	<p>The VIA recommends several landscape strategies to reduce visual impacts, which include:</p> <ul style="list-style-type: none"> ▪ A mix of large and medium evergreen indigenous and native canopy trees to be planted within a 10m landscape setback along the site's eastern boundary. Similar landscaping to be applied to the north, south, and western boundaries to screen the building's lower levels. ▪ Canopy cover to be maximised, especially in car parking areas, to mitigate the urban heat island effect, complemented by shrub and groundcover planting. ▪ High-quality landscaping, including feature fencing and entry treatments, planned throughout the AIBP estate. 	Ma	Future development of the AIBP and the establishment of landscaping will screen views to the warehouse. Views to the site is consistent with the AIBP context.
Traffic, Transport & Accessibility	Impacts on road network from a construction and operation phase.	C & O	C	3	Medium	<p>Construction</p> <p>The CTMP has been prepared to enable the safe management of traffic, provide for the safety of construction personnel, and minimise impacts on the local community. It confirms the proposed warehouse is suitable for approval subject to the implementation of the following mitigation measures:</p> <ul style="list-style-type: none"> ▪ Heavy vehicle exit route will be separate from the construction workers private vehicle access, to minimise traffic congestion within the AIBP internal road network. ▪ Construction signage is to be placed on the approaches to the proposed site, visible for each transport mode, warning the public of the construction works. ▪ Construction vehicles are to be fitted with safety flashing lights located on the top of the vehicle 	Ma	The CTMP has established the relevant response measures to any traffic impacts generated by the proposed construction works.

and functioning reverse beepers, with certified personnel operating them.

- Temporary parking zones are to be set up within the construction site to allow workers to access a safe, separated area which will not impede on any of the warehouse construction activities.
- Consultation be conducted with local council and relevant community stakeholders to ensure traffic changes during the works are communicated and managed.

Additional construction mitigation measures have been identified by the TIA to be implemented where practical and necessary.

- Detailed Traffic Guidance Schemes would be prepared and implemented by suitably qualified personnel for each stage of construction.
 - Road dilapidation surveys are to be completed around the site before and after the construction stage. Any damage to roads will be repaired.
 - When construction vehicles are using Patons Lane for access and egress during off peak periods, full time traffic controllers will be located at the Luddenham Road and Patons Lane intersection, east of the Patons Lane site access. In addition, full time traffic controllers will be located at the existing site access driveway on Luddenham Road, south of the existing Luddenham Road and Patons Lane intersection. This will ensure traffic movements to/ from the AIBP site are coordinated with Sydney Metro construction vehicle movements, to minimise disruptions for
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construction activities and deliveries.

- During the AM and PM peak hours, Sydney Metro construction traffic will be given priority access via Patons Lane. To reduce congestion, traffic controllers will assess the traffic conditions and, if required, will divert any AIBP construction vehicles to access the site via the existing driveway on Luddenham Road.
- Traffic surveys are to be undertaken during construction around the site of works, to monitor how the site is being accessed by AIBP vehicles and to give confidence that AIBP construction traffic is not contributing to delays for Sydney Metro construction vehicles.
- AIBP construction vehicles are not permitted to access the site during critical OSOM deliveries for Sydney Metro. OSOM deliveries will have priority access to Patons Lane overnight, and Sydney Metro will provide notice to the AIBP site team of their delivery schedule.
- All significant construction vehicles would be fitted with safety flashing lights located on the top of the vehicle and functioning reverse beepers. All operators will be licensed for the plant/ equipment.
- Accessways to the site would be provided with adequate sight distances to allow visibility for emerging vehicles.

Operation

The TIA is supported by a GTP to encourage non-private vehicle access to the site during operations. The GTP outlines management measures and recommendations that can be adopted to support the use of sustainable

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- transport modes. The range of measures are summarised below and will be implemented where possible.
- Introduce a travel coordinator role to execute the recommendations of this plan.
 - Monitor the mode share, use and demand of facilities to inform future updates of the GTP.
 - Prepare a Transport Access Guide that is provided to building occupants that details transport options to the site, a public transport map surrounding the site area, site specific transport provisions, and promotes the cost savings of car share.
 - Hold Travel Smart Get to Workdays in the form of workshops encouraging employees to travel by walking, cycling and public modes of transport. Similarly, participate in annual events such as 'Ride to Work Day'.
 - Work with other stakeholders to improve wayfinding signage to public transport (bus stops, future rail networks) between the development and nearby infrastructure hubs such as St Clair and Erskine Park.
 - Produce maps and timetables detailing safe and pleasurable walking routes to and from the building with times, to local facilities, such as shops and bus stops, a map showing public transport stops in the surrounding area and expected walk times needed to access the locations, and a train and bus timetables for services in the local area as part of household welcome packs for all new employees.
 - Supply a communal bicycle repair toolkit for employees and visitors.
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						<p>Come to an arrangement with a local bicycle retailer for servicing of bikes and other incentives.</p> <ul style="list-style-type: none"> ▪ Ensure the bicycle parking and end of trip facilities within the building are maintained. ▪ Allocate spaces as required for car-sharing within the Storage and Distribution warehouse. 		
Trees & Landscaping	Reduced vegetation and biodiversity values which can also lead to increased urban heat island effect.	O	D	3	Low	The proposed development responds to the Greener Places Design Guide to ensure a high-quality landscape design.	Pr	The proposed landscaping will establish and mature over time to fully realise the positive impacts.
Ecologically Sustainable Development (ESD)	Sustainable best practice is not achieved and harm to people and the environment is not minimised.	C+O	C	3	Medium	<p>The following measures have been incorporated into the proposed storage and distribution warehouse to demonstrate the projects ability to uphold best practice in line with elements drawn from the GBCA.</p> <p><u>Management:</u> Promotes the adoption of environmental principals throughout the inception, design, construction and operations of the proposed development. Initiatives include:</p> <ul style="list-style-type: none"> ▪ Provision of detailed operations and maintenance information to support ongoing operations. ▪ Metering of the main building elements to support reporting and optimisation of the project systems. <p><u>Indoor Environment Quality:</u> Enhance the comfort and wellbeing of building occupants.</p> <ul style="list-style-type: none"> ▪ Building services noise levels to be managed to achieve acoustically comfortable spaces. ▪ Low irritant materials and coatings to be used. ▪ LED lighting to meet illuminance, uniformity and glare requirements in applicable areas. 	Ma	Through the implementation of the best practice, sustainability initiatives, the proposed development demonstrates a commitment to ESD principles throughout the design, construction, and operation phases

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- A mechanical system that promotes good thermal comfort in the conditioned spaces.

Energy: Reducing energy consumption and greenhouse gas emissions.

- Inclusion of solar arrays.
- Incorporation of an efficient heating and cooling system.
- Building fabrics that exceed the requirements of the construction code.

Transport: Promotes provisions for reduced greenhouse gas emissions arising from occupant travel to and from the site.

- Provision of end-of-trip facilities to promote the use of alternative modes of transportation.
- Provision of electric vehicle charging that will reduce emissions, promote resource efficiency, decrease noise pollution, and enhances energy independence.
- Implementation of a GTP to promote healthier lifestyles by encouraging walking, cycling, and the use of public transportation

Water: Reduce the amount of potable water consumed on-site.

- Inclusion of highly efficient fixtures and fittings.
- Rainwater collection and reuse.

Materials: Reducing the consumption of resources through selection and reuse of products.

- The use of paints, adhesives, sealants, and carpets are low in TVOC or non-toxic.
 - The use of low TVOC or non-toxic engineered wood products.
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						<p><u>Emissions:</u> Targets building emissions relating to watercourse pollution, light pollution, ozone depletion and global warming.</p> <ul style="list-style-type: none"> All thermal insulants in the project will aim to avoid the use of ozone depleting substances in both their manufacture and composition. To reduce light pollution, no direct light generated inside or outside the building will face directly upward into the sky. Protection of local waterways, and the impacts of flooding and drought. 		
Biodiversity	<p>Impacts to biodiversity and habitat.</p> <p>As the site is mapped as 'certified – Urban Capable Land' under the CPCP, the site must demonstrate consistency with the CPCP mitigation measures.</p>	C	D	4	Low	<p>The BMP recommends the following mitigations measures:</p> <ul style="list-style-type: none"> Prioritise retaining trees where possible and protect them during works with temporary fencing, flagging, and tree protection. Protect riparian corridor vegetation throughout construction; no machinery or personnel to enter. Inspect structures for microbats and other fauna before demolition; relocate fauna safely. Consult a qualified specialist for pest control to reduce the risk of secondary poisoning. No flying fox camps are within 100m of the site. Inspect trees for nests by a qualified ecologist before vegetation clearing. Manage the spread of <i>Phytophthora cinnamomi</i> using best practice methods (see Appendix F of the FFA). Survey vegetation for Cumberland Plain Land Snail before construction; consult relevant land managers if identified. Implement 'open structure design' for structures near known 	Ma	No residual impacts whilst demonstrating compliance with the CPCP.

						populations of Cumberland Plain Land Snail, consistent with the Save our Species program.		
						<ul style="list-style-type: none"> ▪ Manage weeds using best practice hygiene methods per the NSW Biosecurity Act; dispose of waste containing weed propagules at a licensed facility. 		
Air Quality (AQIA)	Generation of potential air pollutants from vehicles and fugitive emissions from vehicle movements.	C+O	E	5	Very Low	No mitigation measures were identified within the AQIA given the operational emission sources are expected to be minor. No impacts were identified and therefore no mitigation measures are proposed.	Pe	Potential impacts are anticipated to be negligible and unlikely to adversely impact upon the surrounding environment.
Noise and Vibration	Adverse noise impacts generated by the construction and operation of the proposed development.	C+O	C	3	Medium	<p>Construction</p> <p>In accordance with the ICNG, where noise is predicted to exceed NMLs, reasonable and feasible mitigation measure should be implemented to minimise impacts. This includes:</p> <ul style="list-style-type: none"> ▪ Work practices: <ul style="list-style-type: none"> – regular reinforcement (such as at toolbox talks) of the need to minimise noise and vibration – regular identification of noisy activities and adoption of improvement techniques – avoiding the use of portable radios, public address systems or other methods of site communication that may unnecessarily impact upon nearby residents – develop routes for the delivery of materials and parking of vehicles to minimise noise – where possible, avoid the use of equipment that generates impulsive noise – minimise the movement of materials and plant and unnecessary metal-on-metal contact 	Pr and Ma	Noise is managed onsite and appropriate measures are in place to monitor noise levels during operational activities.

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- schedule respite periods for intensive works as determined through consultation with potentially affected neighbours (e.g. a daily respite period for a minimum of one hour at midday).
 - Plant and equipment:
 - where possible, choose quieter plant and equipment based on the optimal power and size to most efficiently perform the required tasks
 - movement alarms and beepers to be replaced with non-tonal level varying quackers or equivalent
 - operate plant and equipment in the quietest and most efficient manner
 - regularly inspect and maintain plant and equipment to minimise noise and vibration level increases, to ensure that all noise and vibration reduction devices are operating effectively.

Operation

The site presents limited opportunities to apply mitigation measures to the south-west of the site, particularly for heavy vehicles travelling around the warehouse. To minimise operational noise levels, particularly when operating on the hardstand areas, the following strategies may be adopted where practicable.

- minimising vehicle movements, particularly during the night period
 - not leaving trucks to idle on the hard stand area
 - avoiding impact noise from loading materials or air brake release
 - operate with roller doors down when not loading or unloading trucks.
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Ground and Water Conditions	Potential impacts include deterioration of water quality due to changes in surface water flows, infiltration rates, water extraction, or leaching of saline soils, as well as impacts to health of groundwater dependent ecosystems.	C	D	4	Low	<p>The following mitigation measures have been identified by Ecological Australia to ensure impacts and risks to groundwater conditions are managed. They will be adopted where required, and include:</p> <p>Groundwater levels:</p> <ul style="list-style-type: none"> ▪ Monitor groundwater during site excavations, especially at geotechnical sites BH03 and TP47. ▪ Manage potential impacts at these sites through a site-specific Construction Environmental Management Plan (CEMP). <p>Groundwater quality:</p> <ul style="list-style-type: none"> ▪ Temporary onsite sewage systems pose a risk to surface water quality if spills occur. ▪ Follow Industry Standard spill minimisation and response procedures to reduce potential groundwater contamination during construction. <p>Groundwater dependent ecosystems:</p> <ul style="list-style-type: none"> ▪ Monitor for shallow groundwater during excavations in the northwest portion of the site to protect the Cumberland Riverflat Forest Terrestrial GDE. ▪ Manage potential impacts through site-specific CEMP and Vegetation Management Plan (VMP). <p>Water balance consideration:</p> <ul style="list-style-type: none"> ▪ Use native grasses for rain gardens and biofiltration beds, as they are deep-rooting and tolerant of extreme wet/dry climates. 	Ma	The assessment confirms the risks and potential impacts to groundwater quantity and aquatic GDEs are low. Potential risks and impacts to groundwater quality is also assessed to be low. Therefore it is unlikely any residual impact will occur.
Water Management	Impacts to stormwater quantity and the management of water onsite, as well as impacts to water quality.	C+O	C	3	Medium	<p>Effective stormwater management is achieved through the implementation of the following strategies:</p> <ul style="list-style-type: none"> ▪ To manage increase in stormwater flows, OSD is proposed to appropriately manage runoff. This involves the inclusion of 	Ma	The implementation of the identified strategies will appropriately manage water in the landscape with no residual impact.

						<p>underground tanks in each sub catchment of the site.</p> <ul style="list-style-type: none"> To prevent increase of contaminants in stormwater runoff, water quality measures at source and end of line treatments will be provided. To protect downstream water quality, downstream infrastructure has been incorporated into the broader AIBP bulk earthworks design (under DA24/0294). 		
Flood Risk	Potential impacts to existing flood behaviour and concerns of safe access and egress routes.	C & O	D	4	Low	<p>The following mitigation measures are proposed:</p> <p>Design Solutions:</p> <ul style="list-style-type: none"> Integrated Stormwater Management: The civil design incorporates internal stormwater drainage and on-site detention systems to mitigate any increase in downstream flow rates and volumes, preserving pre-development flow characteristics. Ground Level Design: Proposed pad levels align with the approved flood assessment's bulk earthworks strategy, ensuring overland flow routes are preserved without adverse redirection or concentration of flow. <p>Operational Procedures:</p> <ul style="list-style-type: none"> Evacuation and Access: The site remains flood-free in all modelled events up to the PMF, with trafficable egress via Luddenham Road during PMF conditions. Flood evacuation planning should consider local drainage limitations and recommend safe evacuation ahead of forecast flooding. Flood Emergency Response: Protocols should include early warning systems, proactive site shutdown procedures, and coordination with regional emergency services, following 	Ma	As the development is flood free, incorporates flood risk measures and maintains safe, trafficable access and egress routes under regional flooding scenarios; the development creates negligible flood risk.

						LU01 recommendations for non-sensitive, flood-free developments.		
Hazards and Risks	Storage of dangerous goods in proximity to surrounding or sensitive land uses	O	D	4	Low	<p>The storage of Dangerous Goods will occur onsite; therefore the following recommendations will be adopted where necessary:</p> <ul style="list-style-type: none"> ▪ Design the warehouse in accordance with relevant Australian Dangerous Goods Standards (AS 1940, AS 2118) and FM Global Standards where appropriate. ▪ Reassess the site if there are significant changes in the class, quantity, or location of Dangerous Goods. 	Ma	The assessment determined that the proposed development would not cause offence to the surrounding area.
Contamination and Remediation	Contamination sources present onsite can cause harm to human life.	C	D	3	Low	If isolated pockets of unexpected contamination are encountered during construction works, it should be managed in accordance with the Unexpected Finds Protocol.	Ma	A final validation report was prepared by DRM to confirm the site has been satisfactorily remediated. Therefore residual impacts are considered unlikely.
Waste Management	The proposed development will generate construction waste and operational waste which consist of: Paper/cardboard and other recycling E-waste Toner cartridges Problem waste	C & O	C	3	Medium	<p>The Waste Management Plan recommends the following mitigation measures:</p> <ul style="list-style-type: none"> ▪ All demolition and construction waste will be sorted and stored in bins by material type. ▪ Efforts will be made to maximise the re-use and recycling of existing materials, including: ▪ Re-using and recycling materials as part of material selection. ▪ Planning deliveries to provide the right quantity of materials at the right time to avoid damage and wastage and returning unused materials. ▪ Considering the full lifecycle of the development for re-use and recycling of materials. 	Ma	The implementation of recommended operational and construction waste management measures will efficiently manage waste, with no residual impacts.

						<ul style="list-style-type: none"> ▪ A waste compactor area is provided along the hardstand of the storage and distribution facility site plans. 		
Aboriginal Cultural Heritage	Potential disturbance to Aboriginal cultural heritage sites or values within the site.	C	D	4	Low	An Aboriginal Heritage Advice Letter concluded that the management and mitigation of cultural materials will be completed as part of the bulk earthworks DA before any subsequent State Significant Development (SSD).	Ma	No residual impacts will occur.
Environmental Heritage	Impacts to items of heritage significance within the locality.	C	D	4	Low	A Heritage Letter of Advice recommends incorporating all management measures and project obligations into an Historical Heritage Management Plan that outlines the specified requirements including an unexpected finds protocol methodology.	Ma	No residual impacts will occur.
Social Impact	<p>Negative social impacts to local character, diminished visual amenity, reduced amenity, and changes to traffic conditions.</p> <p>Positive social impacts in relation to economic benefits and employment.</p>	C+O	C	3	Medium	<p>The Social Impact Assessment (SIA) recommends the following mitigation measures:</p> <p>Community:</p> <ul style="list-style-type: none"> ▪ Align the project with local and regional plans and policies. ▪ Maintain effective communication to set community expectations for site changes. ▪ Promote alternative travel options for local workers. <p>Surroundings:</p> <ul style="list-style-type: none"> ▪ Use design principles to soften visual impacts, including visual screening and landscaped setbacks from Luddenham Road and Patons Lane. ▪ Provide continued updates to neighbouring landholders. ▪ Implement a Construction Management Plan. <p>Health and Wellbeing:</p> <ul style="list-style-type: none"> ▪ Implement a Construction Management Plan. ▪ Minimise and control noise, and air pollution by applying reduction methods in alignment with relevant guidelines. 	Pr	Through the implementation of the recommended mitigation measures, the proposed development will appropriately manage potential negative social impacts

						<ul style="list-style-type: none"> Establish a publicly available complaints management process with site signage and a feedback mechanism. <p>Access:</p> <ul style="list-style-type: none"> Provide signage and notifications for local road users about potential traffic congestion. Align future site development with proposed Luddenham Road upgrades. Prepare a Construction Traffic Management Plan to address traffic management requirements, including site signage and temporary parking zones. Establish a publicly available complaints management process with site signage and a feedback mechanism. 		
Infrastructure	The site not being adequately serviced and connected to infrastructure and utilities.	O	C	3	Medium	The AIBP has previously been assessed and confirmed to be adequately serviced by utility and infrastructure. Therefore, the proposed development can be adequately supported from an infrastructure and utilities perspective.	Pe	No residual impacts to occur.
Bush Fire Risk	The site is mapped as being bush fire prone land vegetation category 3.	O	C	3	Medium	<p>The Bushfire Assessment recommends the following mitigation measures:</p> <p>Inner Protection Area (IPA) Requirements:</p> <ul style="list-style-type: none"> With the exception of landscape screening along boundary locations, the subject land is to be maintained to achieve the performance requirement of an Inner Protection Area (IPA) as described by Appendix 4 of PBP. The following landscaping specifications have been designed to achieve the IPA at this site: <ul style="list-style-type: none"> Trees at maturity should not touch or be within 2 m of the building; 	Ma and Pr	The site adopts the appropriate measures to reduce bushfire risk.

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- Tree canopies should be separated by a minimum of 2 m;
 - Ensure gaps in the vegetation, such as between garden beds, to prevent the spread of fire towards the building;
 - Landscaping should be separated from the building by at least 1 m;
 - Grass should be kept mown (as a guide grass should be kept to no more than 100mm in height); and
 - Leaves and vegetation debris should be regularly removed.
 - Fire hydrants are to be installed to comply with AS 2419.1 – 2021 Fire Hydrant Installations - System Design, Installation and Commissioning (AS 2419).
 - Gas services are to be installed and maintained in accordance with AS/NZS 1596-2014 The storage and handling of LP gas.
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