



APPENDIX G –
ENVIRONMENTAL RISK ASSESSMENT

G.1 Environmental risk assessment

The potential environmental risk from the ARRC has been assessed in accordance with Australian/New Zealand Standard International Organisation for Standardisation 31000-2009 *Risk Management – Principles and Guidelines* (AS/NZS ISO 31000-2009) based on the implementation of management measures described in this EIS.

Two factors were considered in rating risk for each scenario: the potential consequences (ie the severity of the impact) and the likelihood that the impact will occur.

The criteria used to rate the potential consequences of impacts to the environment, individuals and society are provided in Table G.1. The criteria used to rate the likelihood that the impact will occur are provided in Table G.2.

Table G.1 Qualitative measures of consequence

Level	Potential consequences to individuals	Potential consequences to the environment and society
1	Minor injury or short-term health effect (eg requiring first aid)	Limited environmental impacts to a small area of low significance Low level repairable damage to commonplace structures Short-term local social issues or disruptions
2	Minor injury or short-term health effects requiring restricted work	Minor short-term environmental impacts not affecting environmental systems Moderate damage to items of local cultural significance or minor damage to items of regional significance Minor medium-term social impacts on local population
3	Major injury or health effects (eg lost time injuries or permanent disabilities) Minor injury or health effects to multiple people	Medium-term environmental impacts affecting local environmental systems Moderate damage to items of regional cultural significance Ongoing local social issues
4	Permanent total disability Major injuries or health effects to multiple people	Long-term environmental impacts with significant effects locally and some effects regionally Irreparable damage to items of regional cultural significance Widespread local social issues and moderate regional social issues
5	Fatality or multiple fatalities	Regional long-term environmental impacts on critical species, habitat or environmental systems Irreparable damage to items of national cultural significance Ongoing major regional social impacts

Table G.2 **Qualitative measures of likelihood**

Level	Likelihood	Approximate chance of occurring during the life of the project
A	Practically impossible	0.1%
B	Not likely to happen	10.0%
C	Possible or could happen	50.0%
D	Likely to happen at some point	90.0%
E	Almost certain to happen	99.9%

The risk rating is determined by comparing the consequences and likelihood ratings using the matrix in Table G.3. Risk levels comprise:

- Level 1 (high), where risks are likely to be unacceptable and additional management measures, major redesign or relocation of project components will be required;
- Level 2 (medium), where there will be some risk that can be managed with project-specific management measures, or cannot be further reduced but is in line with the societal risks associated with the incident type; and
- Level 3 (low), where risks are manageable and there is little risk.

Table G.3 **Risk rating**

Consequence	Likelihood				
	A	B	C	D	E
5	Level 2 (medium)				Level 1 (high)
4					
3					
2					
1	Level 3 (low)				

The environmental risk assessment provided in Table G.4 shows that there is generally a low risk that the ARRC will adversely impact the environment. The environmental risk assessment, however, identified two environmental aspects – air quality and noise – with a Level 2 ‘medium’ rating associated with the predicted impacts of the project. Detailed quantitative technical assessments have been carried out to assess these and other predicted impacts of the project and have recommended the application of management measures to mitigate these impacts (refer Chapter 7 and technical assessment in the EIS).

Table G.4 Environmental risk assessment

Risk description	Environmental risk assessment				
	Consequence	Probability	Risk rating	Predicted impacts	Relevant EIS section/ Appendix
Airport safeguarding					
Project site components infringe on WSA's Prescribed Airspace.	5	A	Low 3 (low)	The project site components would not infringe on WSA's Prescribed Airspace as the maximum height of site components are below the OLS elevation which is approximately 110 m to 125.5 m AHD at the subject property.	Section 6.3 Airport safeguarding Aeronautical Impact Assessment (EIS Appendix H)
The project could impact on aircraft operations (ie through lighting, dust and other environmental impacts).	5	B	Low 3 (low)	Technical studies, including the AIA, undertaken for the EIS have considered any potential impacts to surrounding land uses, including the WSA. The ARRC is unlikely to interfere with airport lighting zones or to cause any hazard from sunlight reflections due to reflectivity values of structures and objects on the site. All waste acceptance, processing and storage will occur in an enclosed warehouse, limiting environmental impacts to surrounding receivers, such as dust and light generation.	
The ARRC could increase the potential for wildlife collision with aircraft.	5	B	Low 3 (low)	The ARRC is unlikely to increase the potential for wildlife collisions with aircraft due to the area around the WSA already a natural habitat for birdlife. Mitigations and activities at the ARRC are likely to reduce the number of birds in the area.	

Table G.4 Environmental risk assessment

Risk description	Environmental risk assessment				
	Consequence	Probability	Risk rating	Predicted impacts	Relevant EIS section/ Appendix
Air quality					
Dust levels exceed criteria at sensitive receiver locations.	2	D	Level 2 (medium)	<p>Dust will be generated during construction and operation. Dust suppression measures will be implemented during the 18-month construction period to control generation of dust from the ARRC site.</p> <p>Operational dust impacts are predicted to be low given that most site activities will occur within the enclosed waste acceptance, processing and storage warehouse. Wheel generated dust from trucks entering and exiting the site, the largest contributing source, will be achieved through the installation of a wheel wash and through deployment of a street sweeper twice a day.</p> <p>Some air quality exceedances are predicted at R3 (unoccupied residence).</p> <p>Best practice control measures, related to dust suppression are outlined in Section 7.3.5 the air quality impact assessment (Appendix I).</p> <p>Dust from the project is not predicted to impact airport operations.</p>	Section 6.4; and Air Quality Impact Assessment (EIS Appendix I)
Odour is detected at sensitive receiver locations.	2	A	Level 3 (low)	No odour emissions are predicted as there will be no compositing on site and no odour generating materials will be accepted,.	
Significant GHG emissions are generated.	1	A	Level 3 (low)	The GHG contribution from the ARRC to national GHG emissions will be extremely low.	

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Risk description	Environmental risk assessment				
	Consequence	Probability	Risk rating	Predicted impacts	Relevant EIS section/ Appendix
Noise and vibration					
Noise and vibration levels from construction, and noise from operation of recycling facility exceed noise and vibration criteria at sensitive receiver locations.	2	E	Level 2 (medium)	Noise will be generated during the construction and operation of the ARRC. Vibration will be generated during the construction of the ARRC. Control measures will be implemented to mitigate and manage noise and vibration during the 18-month construction period (refer Section 7.4.7 and Appendix I). All waste processing activities (ie screening and sorting) will occur within the enclosed warehouse. Prior to rezoning, noise levels are predicted to be above applicable criteria at sensitive receiver locations. If the area is not rezoned, additional control measures will need to be agreed with the impacted residents. Following rezoning, noise levels are predicted to be below applicable criteria at sensitive receiver locations.	Section 6.5 Noise and vibration Noise and Vibration Impact Assessment (EIS Appendix J)
Noise levels from road transport exceed noise criteria at sensitive receiver locations.	2	D	Level 2 (medium)	The ARRC will generate traffic noise during the construction and operation. If load limits on Adams Road south of the subject property are lifted and this section is used by ARRC-related traffic, there is the potential for exceedances of road noise criteria at sensitive receiver locations south of the ARRC site in the early years of operation prior to background traffic growth due to Aerotropolis development.	

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Risk description	Environmental risk assessment				
	Consequence	Probability	Risk rating	Predicted impacts	Relevant EIS section/ Appendix
Surface water					
Stormwater runoff is generated from the site and flows off site.	1	B	Level 3 (low)	The design of the ARRC provides for an on-site stormwater management system surrounding the warehouse. The stormwater management system will direct runoff to the onsite detention storage.	Section 6.6 Surface Water Surface Water Assessment (EIS Appendix K)
ARRC pollutes water.	2	B	Level 3 (low)	Waste acceptance, processing and storage will occur inside an enclosed warehouse. The stormwater management system will prevent stormwater entering areas with any waste residue that could pollute surrounding water sources. Dirty water from these areas will be captured, treated and reused.	
ARRC increases flood risks.	1	B	Level 3 (low)	The ARRC is expected to remain above the limit of flooding along Oaky Creek for all events including the probable maximum flood (PMF) for the stage 1 development conditions of WSA, with the exception of the onsite detention storage, which is expected to be inundated by the fringe of the PMF event. The site is not expected to increase flood levels in Oaky Creek. A detailed flood assessment has been completed as part of this EIS.	
ARRC disturbs acid sulphate soils (ASS).	1	A	Level 3 (low)	There are no ASS in the ARRC site, as per the Guidelines for the <i>Use of Acid Sulfate Soil Risk Maps</i> (DLWC 1998) and based on ASS mapping in the eSPADE system (OEH 2016).	

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Risk description	Environmental risk assessment				
	Consequence	Probability	Risk rating	Predicted impacts	Relevant EIS section/ Appendix
Groundwater					
Reduce groundwater availability to other users.	1	A	Level 3 (low)	The ARRC will not take any groundwater and groundwater - users will not be impacted.	
Reduce water availability to groundwater dependent ecosystems.	1	A	Level 3 (low)	The ARRC will not take any groundwater and groundwater dependent ecosystems will not be impacted.	
Pollution of groundwater.	2	A	Level 3 (low)	Any spills are unlikely to impact groundwater due to the proposed hardstand surface of the site.	
Traffic and transport					
Traffic volumes exceed the capacity of local roads and intersections.	2	B	Level 3 (low)	The ARRC will generate traffic as a result of construction and operation. However, vehicles associated with the ARRC will not generally decrease level of service on the local road network. The future poor performance of the Elizabeth Drive/Adams Road is predicted regardless of whether the ARRC is developed.	Section 6.7 Traffic and transport Traffic Impact Assessment (EIS Appendix L)
Traffic volumes exceed the capacity of regional roads and intersections.	2	B	Level 3 (low)	Vehicles associated with the ARRC will not increase traffic volumes beyond the road networks capacity and will only result in minor level of service changes on the local road network.	
Socio-economic					
The ARRC will have adverse social and economic impacts.	1	A	Level 3 (low)	The ARRC has been designed and developed with feedback sought from relevant government agencies and surrounding land holders, and in accordance with all relevant environmental and planning legislation. The ARRC is expected to provide the benefits of employment, economic activity, resource recovery and a number of other social and economic benefits to the local and wider Sydney community.	Section 6.8 Socio-economic Economic assessment (EIS Appendix M)

Table G.4 Environmental risk assessment

Risk description	Environmental risk assessment				
	Consequence	Probability	Risk rating	Predicted impacts	Relevant EIS section/ Appendix
Hazard and risk, including bushfire					
The ARRC will increase hazardous events.	1	C	Level 3 (low)	<p>The ARRC is not considered a hazardous development. No special, liquid, hazardous, restricted or general solid waste (putrescible), as defined by the EPA (2014) will be accepted at the ARRC.</p> <p>All liquids, chemicals and fuels to be used for maintaining plant and equipment will be stored in a dedicated/bunded area within the warehouse.</p>	Section 6.9 Hazard and risk Bushfire (EIS Appendix N)
Potential for activities at the ARRC site to cause a bushfire.	4	A	Level 3 (low)	<p>The potential for activities at the ARRC site to cause a bushfire is minimal.</p> <p>The majority of the site activities will be in an enclosed metal clad warehouse. This means that all flammable liquids and chemicals used in the plant and equipment maintenance process will be stored away from direct sunlight, and in a dedicated/bunded area within the warehouse.</p> <p>A bushfire assessment report with appropriate control measures has been prepared as part of the EIS.</p> <p>Spill response kits will be available should there be a spill of flammable substances.</p>	

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Risk description	Environmental risk assessment				
	Consequence	Probability	Risk rating	Predicted impacts	Relevant EIS section/ Appendix
Biodiversity					
Direct impacts such as loss of native vegetation and fauna habitat; fragmentation.	1	E	Level 3 (low)	<p>The project is in a historically cleared landscape where the majority of native vegetation has been partially or fully cleared for grazing and cropping. However, patches of native vegetation remain along riparian corridors, road reserves and as scattered remnant patches in the landscape surrounding the ARRC site.</p> <p>There are patches of poor and medium quality PCT 1800 Swamp Oak open forest on river flats of the Cumberland Plain and Hunter valley (Swamp Oak) within the ARRC site.</p> <p>Direct and indirect impacts on native vegetation have been calculated as part of the BDAR prepared for the EIS (EMM 2020) and will result in offset requirements:</p> <ul style="list-style-type: none"> • a total of 7 credits are required to offset the vegetation impacts of the project; and • a total of 6 species credits are required to offset the residual impacts of the project. <p>There will be a net improvement in biodiversity with the implementation of the offsets.</p>	Section 6.11 Biodiversity Development Assessment Report (EIS Appendix O)

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Risk description	Environmental risk assessment				
	Consequence	Probability	Risk rating	Predicted impacts	Relevant EIS section/ Appendix
Indirect impacts such as edge effects, introduced species, noise and impacts to wetlands.	2	B	Level 3 (low)	<p>The ARRC has been designed and developed with feedback from relevant government agencies and in accordance with all relevant environmental and planning legislation.</p> <p>The proposed mitigation and management measures outlined in the EIS (Chapter 6 and Appendix C) are expected to be sufficient to mitigate any additional potential indirect impacts to biodiversity.</p> <p>A BDAR has been prepared for the project outlining any offset requirements.</p> <p>The area will be transformed to be less rural with the development of the WSA and Aerotropolis, and the proposed rezoning to an Agribusiness precinct.</p>	Section 6.11 Biodiversity Development Assessment Report (EIS Appendix O)
The project will attract wildlife.	5	B	Level 3 (low)	<p>The project is not expected to attract wildlife as it incorporates a fully enclosed design and will not accept putrescible waste. A birdstrike risk review is appended to the Aeronautical Impact Assessment (EIS Appendix H).</p>	

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Risk description	Environmental risk assessment				
	Consequence	Probability	Risk rating	Predicted impacts	Relevant EIS section/ Appendix
Urban design and visual					
ARRC design is not compatible with the surrounding environment.	1	C	Level 3 (low)	The ARRC has been designed in consideration of potential environmental issues and in consultation with relevant government agencies. The design of the site and the warehouse has been refined to meet all specified requirements, and as such, it is expected to be compatible with the surrounding environment.	Section 6.12 Urban Design and Visual
Local visual amenity is significantly impacted.	1	C	Level 3 (low)	The visual quality of the site has been rated low to moderate. No listed scenic or significant vistas near the ARRC have been identified. The visual changes anticipated from the project are minor in comparison to the changes that will occur as a result of the development of the WSA and Aerotropolis. Thus, the impacts on the local visual amenity are expected to be minor.	
Aboriginal heritage					
Potential to disturb areas of Aboriginal cultural significance.	2	B	Level 3 (low)	There is one archaeological site on the banks of a dam within the subject property. This will not be impacted by the ARRC. There are no identified archaeological sites within the ARRC site. Test excavations are proposed.	Section 6.13 Aboriginal Heritage Aboriginal Cultural Heritage Assessment (EIS Appendix Q)
Potential to disturb areas of historical (non-Aboriginal) significance.	1	A	Level 3 (low)	There are no identified historical items landmarks, such as heritage buildings or other structures, on or in the vicinity of the ARRC site.	

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Risk description	Environmental risk assessment				
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Land and soil					
Depletion of soil resources.	2	B	Level 3 (low)	Depletion of soil resources is not expected to occur as a result of the ARRC site.	Section 6.14 Land and soil Land, Soil and Erosion Assessment Report (EIS Appendix R)
The project is incompatible with surrounding land uses and proposed zoning.	2	B	Level 3 (low)	The area surrounding the site is sparsely populated, making the site ideal for development. Furthermore, the project, as the second step in CPG's vision provides a pathway for a viable future agribusiness land use on the subject property.	
Contamination					
Disturbance of existing contamination.	2	B	Level 3 (low)	Following removal of the stockpiled material found in the north-eastern portion of the ARRC site to an appropriately licensed facility, there is a low potential for contamination to be present which would prevent the future development of the site as an ARRC.	Section 2.3 ARRC operations Section 6.15 Contamination Preliminary Site Investigation (EIS Appendix S)
Importation of contamination.	1	C	Level 3 (low)	The materials accepted by waste facilities are restricted to the specified waste types approved by the development consent for the facility and by the site's EPL. The only waste types to be accepted by the ARRC are listed in Section 2.3.1 of the EIS. An incoming waste plan will be prepared in accordance with the NSW EPA's <i>Standards for Managing Construction Waste in NSW</i> (EPA 2019), to prevent the importation of contaminants to site. Any potential contaminants found during the waste sorting process will be placed in appropriate storage bins and disposed of at an appropriate licensed facility.	

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Risk description	Environmental risk assessment				
	Consequence	Probability	Risk rating	Predicted impacts	Relevant EIS section/ Appendix
Infrastructure					
Project infrastructure is not maintained.	2	B	Level 3 (low)	Adams Road north of the subject site, between the site access road and Elizabeth Drive, will be upgraded by the applicants to ensure that it is suitable for use by heavy vehicles. Adams Road south of the subject site, between the site access road and the recently constructed The Northern Road, will not be used by ARRC-related heavy vehicles until the load limit is lifted.	Section 6.16 Infrastructure