URBIS

APPENDIX C – 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 DPIE's hierarchy of approaches for managing impacts identified in the *Draft Environmental Impact Assessment Guidance Series* released by DPE 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

Likelihood		Consequence	
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.

CONSEQUENCE	LIKELIHOOD A	B	C	D	E
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
	Vehicular accident / injury arising from	O	C	2	Medium	No Right Turns signs be included at the exit as well as on	Pr	Low

SEARS	Potential Impact	Stage of Project	Likelihood	Consequence	Risk Level	Approach	Mitigation Measure (Pe/Pr/Ma)	Residual Impact
Traffic and Transport	unsafe access to the site.					the median on Turton Road adjacent to the site Include a No U Turn sign on the median on Turton Road at Monash Road consistent with the current one for northbound traffic. A Traffic Guidance Scheme is recommended to manage inbound and outbound traffic, accommodate pedestrians and cyclists and allow for the work directly impacting Turton Road which will be the subject of a works authorisation deed (WAD) with TfNSW. The pedestrian pathway through the carpark will be marked as a pedestrian crossing ensuring priority for pedestrians (cyclists to dismount). During events traffic/pedestrian control will be implemented at crossing of the pedestrian boulevard and carpark access driveway to manage the movement of inbound pedestrians, and to ensure there		

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						is no queuing back towards Turton Road. The carpark will be sign posted as a shared zone at the entrance.		
	Delays at Turton Road/ Griffiths Road intersection	O	C	3	Medium	Optimise traffic lights phase times.	Pr	Low
	Impacts on road network from construction and operational phase.	C & O	D	4	Low	Implement Green Travel Plan to actively promote increased use of sustainable transport modes. The Preliminary Construction Traffic Management Plan accompanying this EIS is to be incorporated into a Construction Traffic Management Plan.	Ma	Low
	Impact of Stage 1b and Stage 2 construction on operation of the HIS	C & O	C	3	Medium	Construction personnel will not park on site. Scheduling of deliveries to occur in the morning outside of the peak afternoon usage of the HISC. Pedestrian and cyclist access will be maintained at all times with suitable detours.	Pr, Ma	Low

SEARS	Potential Impact	Stage of Project	Likelihood	Consequence	Risk Level	Approach	Mitigation Measure (Pe/Pr/Ma)	Residual Impact
						Construction traffic will be separated from access by users of the HISC to the carparking within the site. If internal pedestrian or vehicle detours be needed these are to be laid out and managed in accordance with TfNSW traffic Control at Work Sites Manual (TCAWS) Pedestrian access to be maintained along site frontage. Provide signage for exiting vehicles to indicate the pedestrian footpath.		
Noise and Vibration	Construction noise Impacts	C	C	3	Medium	All works are to be carried out in accordance with the EPA Interim Construction Noise Guideline and AS 2436. A Construction Noise Management Plan (CNMP) will be prepared prior to the commencement of works. The CNMP should include the following: Identification of sensitive receivers potentially impacted and nominates noise and	Ma/ Per	Low

SEARS	Potential Impact	Stage of Project	Likelihood	Consequence	Risk Level	Approach	Mitigation Measure (Pe/Pr/Ma)	Residual Impact
						vibration management objectives for each. Protocols for notification to affected neighbours of construction works. Identification of the proposed significant construction activities, plant and processes and times of site operation. Predication and assessments of noise and vibration impacts and recommends appropriate controls. Nominated compliant handling procedures and responses, community liaison principles and site management practices to be adopted. Construction works should adopt Best Management Practice (BMP) and Best Available Technology Economically Achievable (BATEA) practices as addressed in the ICNG. All works are to be carried out in accordance with the EPA Interim		

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						Construction Noise Guideline and AS 2436. Use Noise Management Levels (NML's) to identify demolition, excavation and construction noise sources or scenarios that require engineering controls or administrative management; Provide flexibility in the selection of site-specific and reasonable work practices to minimize noise impacts; Construction/ demolition work is be undertaken within approved standard hours where reasonably practicable. Approval is required for works undertaken outside standard hours; and The use of noise reduction techniques including, but not limited to, barriers, enclosures and silencers shall be employed to ensure compliance with construction and demolition noise criteria.		

SEARS	Potential Impact	Stage of Project	Likelihood	Consequence	Risk Level	Approach	Mitigation Measure (Pe/Pr/Ma)	Residual Impact
	Operational noise impacts	O	C	3	Low	HISC is to operate within approved hours. Operations are to comply with project noise limits.	Pr	Low
Visual Impacts	Visual impacts on public receivers.	O	C	4	Low	Implement screening vegetation to hardstand areas along Turton Road and screening to Monash and western interface of site, in accordance with the landscape plans. Provide under planting to tall, native, evergreen species. Ensure screening vegetation/ trees are established in the early stages of the development. Used varied treatment and use of recessive colours to the facade to reduce its perceived mass and encourage integration into the existing landscape.	Pr	Low
Contamination	Exposure to contamination during construction	C	C	3	Low	Manage impacted soils through the implementation of the RAP, prepared in accordance with the NSW EPA (2020) *Contaminated land guidelines consultants reporting on contaminated land.*	Pr/Ma	Low

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						If any material is identified at the site which is not consistent with the descriptions provided in the DSI, it is recommended that works cease, and investigations are undertaken in accordance with a site Unexpected Finds Protocol (UFP). A Construction Environmental Management Plan (CEMP) is to be developed prior to the commencement of remediation activities in accordance with the Newcastle City Council Development Control Plan 2023.		
	Management of the potential for exposure to contamination during operation.	O	C	3	Low	Implement the Long Term Environmental Management Plan (LTEMP) to mitigate future exposure to impacted soils, manage potential human health or ecological concerns, and protect the safety of members of the public accessing the site.	Ma	Low
Lighting	Lighting impacts to the adjoining residential areas, light pollution or light spill into the	O	C	4	Low	Utilise smart lighting control strategies including motion detector control.	Pr	Low

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	night sky or site surrounds.					10pm – Dawn: All lighting to dim down to 30%, intelligent lighting control to bring lighting back to 100% only when presence is detected. Motion detector control – luminaires incorporate motion sensor, lighting ramps up to maximum when movement is detected, reverts to minimum level when no movement is detected. 10pm curfew switch-off of certain types of lighting. This can be appropriate for 'decorative' lighting, which is not required for safety or orientation, and can be turned off late at night when it is less likely to add value.		
Wind	Wind impacts to users of the facility	O	C	4	Low	Implement proposed landscaping to the carpark and planter boxes to the building. Retain trees on the western side of the site and to the Turton Road frontage.	Pr	Low

SEARS	Potential Impact	Stage of Project	Likelihood	Consequence	Risk Level	Approach	Mitigation Measure (Pe/Pr/Ma)	Residual Impact
Flood	Threat to people/ property in the event of a flood.	O	C	2	Medium	Retain on-site flood storage. Limit obstructions within the external car park area. Retain the floodway along the eastern side of the site. Suitable bollards will be employed along the northern and southern boundaries of the car park area to prevent vehicles from being washed into the Lambton Ker-rai Creek or other key drainage infrastructure. Implement the Flood Emergency Response Strategy.	Pr/Ma	Low
Tree removal	Retained trees may be damaged by construction activities and/or be required to be removed.	C	D	3	Low	Trees 2, 3, 4, 5, 6, 8, 13, 14, 15, 18, 19, A, B, C, D, E, be retained. Trees 7,16, F and G be retained following the requirements of the Tree Protection Plan. To compensate for the loss of Trees 1, 9, 10, 11, 12 and 17, it is recommended that 28 standard trees [45litre] be planted on the site.	Pr	Low

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						Prepare and implement a tree protection plan to protect the trees to be retained on site.		
Aboriginal Heritage	Impacts of construction activities on unexpected archaeological finds	C	D	3	Low	Ongoing consultation with RAPs is to continue until the finalisation of the proposed development to ensure the opportunity for Aboriginal community input. <u>Unexpected Finds Procedure</u> Stop work within the affected area and protect the potential archaeological find. The site supervisor must contact either the project archaeologist (if relevant) or Heritage NSW. The nominated archaeologist must examine the find, provide a preliminary assessment of significance, record the item and decide on appropriate management measures. Depending on the significance of the find, reassessment of the archaeological potential of the subject area may be required	Pr/ Ma	Low

SEARS	Potential Impact	Stage of Project	Likelihood	Consequence	Risk Level	Approach	Mitigation Measure (Pe/Pr/Ma)	Residual Impact
						and further archaeological investigation undertaken. Works in the vicinity of the find can only recommence upon receipt of approval from Heritage NSW. In the unlikely event that human remains are found: Immediately cease all work at the particular location. The site supervisor must notify NSW Police and Heritage NSW as soon as practicable and provide details of the remains and their locations. The find must be assessed by the NSW Police and management recommendations will be formulated by the NSW Police, Heritage NSW and site representatives. Works are not to recommence until the find has been appropriately managed.		
Heritage	Evidence of dummy gun	C	C	2	Medium	All relevant construction staff, contractors and subcontractors	Pr /Ma	Low

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	emplacements (concrete footing, remnant dummy gun materials) area damaged by construction.					must be made aware of their statutory obligations for heritage under the NSW Heritage Act 1977 and best practice as outlined in The Burra Charter (Australia ICOMOS 2013) to ensure no archaeological remains or heritage fabric are impacted during the proposed works without appropriate mitigation measures in place. A program of archaeological monitoring and recording is to be undertaken prior to excavation works. The results of the archaeological monitoring program, including survey data, would be presented in a standalone results report. An Unexpected Finds Procedure is to be implemented for all excavation works not subject to direct management by an archaeologist. If archaeological ‘relics’ are unexpectedly identified during any excavation work, dependant on the nature and significance of		

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						the find, there may be a requirement to notify Heritage NSW in accordance with Section 146 of the NSW Heritage Act 1977.		
Biodiversity	Loss of habitat for bats	C	D	3	Low	Undertake pre-clearance surveys to detect bat roosting in human made structures (i.e. buildings in southern section of the subject land) and breeding threatened species in trees to be removed. Animal rescue (WIRES or equivalent) to be notified in the event where wildlife is injured or impacted during the removal of vegetation and/or human-made structures. Clearing works to comply with Australian Standards (AS) 4970-2009 Protection of trees on development sites Temporary tree protection zone fencing to be implemented around retained trees and comply with AS 4970-2009.	Pr,Per	Low

SEARS	Potential Impact	Stage of Project	Likelihood	Consequence	Risk Level	Approach	Mitigation Measure (Pe/Pr/Ma)	Residual Impact
	Introduction of weed species	C	D	3	Low	Works to comply with 'Arrive Clean, Leave Clean -Guidelines to help prevent the spread of invasive plant diseases and weeds threatening our native plants, animals and ecosystems' (DCCEEW 2015). Sediment barriers to be implemented on areas of Lambton Ker-rai Creek near works areas.	Pr	Low
Social	Loss of open space	C & O	A	2	High	CN will facilitate the relocation of the existing sporting clubs to alternative facilities (as negotiated and agreed between CN and the peak sporting bodies).	Pr	Low
	Construction impacts to Lambton High School	C	B	3	Medium	BANL to coordinate with Lambton High School to facilitate access to the HISC to support their delivery of curriculum as well as general sport and recreation activities. The Principal Contractor will work with Lambton High School to manage all key risks and	Pr	Low

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						controls on site to mitigate impact on the school operations.		
	Construction impacts to community	C	B	3	Medium	The hours of construction including delivery of materials to and from the site will be restricted to between: Monday to Friday inclusive 7.00am to 6.00pm, Saturday 8:00am – 1:00pm and no work on Sundays and Public Holidays. All practicable measures will be taken to reduce the noise arising from the Works. Noise from the Site will not exceed the limits set out in the Interim Construction Noise Guidelines (ICNG) and Environmental Protection Authority. No machine work will occur outside approved working hours unless approval has been given by the consent authority	Pr	Low
Crime Prevention Through Environmental Design	Opportunities for concealment and unsafe environmental around the	O	C	2	Medium	Implement the recommendations of the CPTED report in the detailed design of the facility:	Pr	Low

SEARS	Potential Impact	Stage of Project	Likelihood	Consequence	Risk Level	Approach	Mitigation Measure (Pe/Pr/Ma)	Residual Impact
	proposed development							
Waste	Odour impacts, visual impacts from inappropriate storage of waste	O	C	3	Low	The walls and floors of all waste storage facilities are to be constructed of smooth faced masonry or concrete, and all walls will be painted with light coloured and washable paint. The junction between all floors and walls will be coved and sealed up to 100mm above the floor level, in order to eliminate the build-up of dirt and grime. Appropriate washing facilities will be provided to the bin storage area, including appropriate plumbing and drainage fixtures and the provision of running water to support the regular cleaning of all mobile bins and the bin storage area. Natural and mechanical ventilation will be required to be installed within all waste storage facilities in accordance with the relative provisions of the Building Code of Australia.	Pr	Low

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						Appropriate signage will be displayed in a prominent position clearly identifying the location of all waste storage facilities. BANL will be responsible for ensuring that all waste and recyclable matter and materials are placed and stored within the appropriate containers provided.		
Geotechnical	Ground becomes soft and boggy during wet weather.	C	D	3	Low	Affected soft material shall be removed prior to construction of footings, slabs or pavements. To improve the trafficability of the site, minimise construction delays, and enable proper functioning of the pavement, adequate surface and sub-surface drainage should be provided. Larger footings than 1.5m shall be checked by a geotechnical engineer to ensure settlements are within project tolerances. All structural loads are supported by piers or piles taken to the very stiff clay and/or	Pr	Low

SEARS	Potential Impact	Stage of Project	Likelihood	Consequence	Risk Level	Approach	Mitigation Measure (Pe/Pr/Ma)	Residual Impact
						sandstone bedrock at approximately 8m depth. Ground bearing floor slabs may be used up to a total loading of 15kpa, above this it is recommended that slabs are suspended and supported on piers taken to the very stiff clay and/or sandstone bedrock at approximately 8m depth. Bored pier or pile excavations are to be assessed by a geotechnical engineer during construction to ensure that founding conditions are consistent with those on which the design recommendations are based.		
	Disturbance of Acid Sulfate Soils	C	D	4	Low	Excavation exceeding 3m in depth is to be treated in accordance with the ASSMP prepared for the site, including a regime for testing of soil and groundwater.	Pr	Low