NSW GOVERNMENT

Transport for NSW

Beaches Link and Gore Hill Freeway Connection

Appendix A

Secretary's environmental assessment requirements checklist

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Secretary's environmental assessment requirements checklist

Desired performance outcome	SEARs requirements	Where addressed in this EIS
General requirements		
1. Environmental impact assessment process The process for assessment of the proposal is transparent, balanced, well focussed and legal.	1. The Environmental Impact Statement must be prepared in accordance with Part 3 of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000* (the Regulation).	**Appendix B** (Environmental Planning and Assessment Regulation checklist).
	2. It is the Proponent's responsibility to determine whether the project needs to be referred to the Commonwealth Department of Agriculture, Water and the Environment for an approval under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).	**Chapter 2** (Assessment process), **Section 2.2.2** (Assessment process) outlines the decision process and justification for not referring the project.
	3. The onus is on the Proponent to ensure legislative requirements relevant to the project are met.	**Chapter 2** (Assessment process) outlines the legislative requirements relevant to the project and how they are met.
2. Environmental Impact Statement The project is described in sufficient detail to enable clear understanding that the project has been developed through an iterative process of impact identification and assessment and project refinement to avoid, minimise or offset impacts so that the project, on balance, has the least adverse environmental, social and economic impact,	1. The EIS must include, but not necessarily be limited to, the following: a. an executive summary;	**Executive summary**.
	b. description of the project and all components and activities (including ancillary components and activities) required to construct and operate it, including:	**Chapter 5** (Project description) describes the proposed route of the project, while **Chapter 6** (Construction work), **Section 6.8** shows the key construction activities and temporary construction support sites along the proposed route.
	- the proposed route;	**Chapter 5** (Project description), **Section 5.1, Section 5.2** and **Section 5.3** describe the proposed route.

Desired performance outcome	SEARs requirements	Where addressed in this EIS
including its cumulative impacts.	- design of the tunnels, interchanges (inclusive of tunnel portals and entry and exit ramps), road user, pedestrian and cyclist facilities, and lighting;	**Chapter 5** (Project description), **Section 5.2** and **Section 5.3** describe surface works, surface connections, pedestrian and cyclist facilities and lighting. **Chapter 6** (Construction work), **Section 6.4** and **Section 6.5** describe the tunnel construction method and construction method for surface road works and associated infrastructure.
	- surface road upgrade works, including road widening, intersection treatment and grade separation works, property access, parking, pedestrian and cyclist facilities (including appropriate locations for overbridges) and public transport facilities;	**Chapter 5** (Project description), **Section 5.2** and **Section 5.3** describe the surface road works, surface connections and pedestrian, cyclist and public transport facilities. **Chapter 6** (Construction work), **Section 6.5** describes the construction method for surface road works and associated infrastructure, including bridgeworks and pedestrian facilities. **Chapter 8** (Construction traffic and transport), **Section 8.4** describes access constraints and impacts on parking, pedestrians and cyclists and public transport.
	- ancillary infrastructure and operational facilities, such as operational and maintenance facilities, ventilation structures and systems, and fire and emergency services and infrastructure for the proposal, including (if required) additional infrastructure (such as tolling infrastructure);	**Chapter 5** (Project description), **Section 5.2** and **Section 5.3** describe the operational facilities and ancillary infrastructure. **Chapter 6** (Construction work), **Section 6.8** describes the temporary construction support sites required to construct the project, while **Section 6.4.6** outlines detail on the construction of operational facilities and ancillary infrastructure.
	- location and operational requirements of construction ancillary facilities and access;	**Chapter 5** (Project description), **Section 5.2** and **Section 5.3** describe the operational facilities and ancillary infrastructure. **Chapter 6** (Construction work), **Section 6.8.2** describes the location and hours of construction at each temporary construction support site and their respective access arrangements.

Desired performance outcome	SEARs requirements	Where addressed in this EIS
	- land use changes as a result of the proposal and the acquisition of privately owned, Council and Crown lands, and impacts to Council and Crown lands; and	**Chapter 20** (Land use and property), **Section 20.4** discusses impacts to properties, including property acquisitions and future land uses during construction and operation.
	- the relationship and/or integration of the project with existing and proposed public and freight transport services;	The relationship and integration of the project with existing and proposed public and freight transport services is described in **Chapter 3** (Strategic context and project need), **Section 3.5** and **Section 3.6**. Additional information about the relationship and integration of the project with existing and proposed public and freight transport services is provided in **Chapter 5** (Project description), **Chapter 8** (Construction traffic and transport), **Chapter 9** (Operational traffic and transport) and **Chapter 27** (Cumulative impacts).
	c. a statement of the objective(s) of the project,	**Chapter 3** (Strategic context and project need), **Section 3.4** states the project objectives.
	d. a summary of the strategic need for the project with regard to its State significance and relevant State Government policy;	**Chapter 3** (Strategic context and project need), **Section 3.1**, **Section 3.2** and **Section 3.3** outline the strategic need for the project. Reference to the project's State significance and relevant State Government policies are provided in **Section 3.7**.
	e. an analysis of any feasible alternatives to the project;	**Chapter 4** (Project development and alternatives), **Section 4.3** provides an analysis of strategic alternatives. **Section 4.4** provides an analysis of corridor alternatives.
	f. a description of feasible options within the project, including: - alternative methods considered for the construction of the project, including the tunnels; and - staging of the proposal;	**Chapter 4** (Project development and alternatives), **Section 4.5** provides detail on alternative construction methods including tunnelling methodologies. **Chapter 6** (Construction work) provides detail on staging of the construction work.

Desired performance outcome	SEARs requirements	Where addressed in this EIS
	g. a description of how alternatives to and options within the project were analysed to inform the selection of the preferred alternative / option. The description must contain sufficient detail to enable an understanding of why the preferred alternative to, and options(s) within, the project were selected, including: - details of the alternative construction methods that were considered for tunnel construction, particularly those areas spanning Sydney (Middle) Harbour; - details of the short-listed route and tunnel options considered, and the criteria that was considered in the selection of the preferred route and tunnel design; - the alternative tunnel design and ventilation options considered to meet the air quality criteria for the proposal; and - a justification for the preferred proposal taking into consideration the objects of the *Environmental Planning and Assessment Act 1979;*	**Chapter 3** (Strategic context and project need), **Section 3.5** and **Section 3.6** describe the benefits of the overall program of works and the project respectively. **Chapter 4** (Project development and alternatives), **Section 4.4** and **Section 4.5** detail the assessment of alternatives. **Chapter 28** (Synthesis of environmental impact statement), **Section 28.7** provides the justification for the preferred proposal taking into consideration the objects of the *Environmental Planning and Assessment Act 1979*.
	h. a concise description of the general biophysical and socio-economic environment that is likely to be impacted by the project (including offsite impacts). Elements of the environment that are not likely to be affected by the project do not need to be described;	**Chapters 8** to **27** (Existing environment section within each chapter, where relevant).
	i. a demonstration of how the project design has been developed to avoid or minimise likely adverse impacts during construction and operation of the project;	**Chapter 4** (Project development and alternatives), **Section 4.4** and **Section 4.5** outline information on project design development. **Chapter 5** (Project description), **Section 5.2** and **Section 5.3** detail the key environmental controls that will be implemented by the project to minimise adverse impacts during construction and operation.

Desired performance outcome	SEARs requirements	Where addressed in this EIS
		Chapter 6 (Construction work) details the construction methods which have been considered, based on project design development and the requirement to minimise impacts on the environment. **Appendix Y** (Compilation of environmental management measures) provides a summary of all the environmental management measures for construction and operation of the project.
	j. the identification and assessment of key issues as provided in the 'Assessment of Key Issues' performance outcome;	**Chapters 8** to **27** (Assessment of potential impacts sections within each chapter).
	k. a statement of the outcome(s) the proponent will achieve for each key issue;	**Chapter 28** (Synthesis of the environmental impact statement), **Section 28.6** provides a compilation of the outcomes the proponent will achieve.
	l. measures to avoid, minimise or offset impacts must be linked to the impact(s) they treat, so it is clear which measures will be applied to each impact;	**Chapters 8** to **27** (Environmental management measures section within each chapter). **Appendix Y** (Compilation of environmental management measures) provides a compilation of all the environmental management measures for the project.
	m. consideration of the interactions between mitigation measures, between impacts and between measures and impacts;	**Chapter 28** (Synthesis of the environmental impact statement), **Section 28.4** provides a summary of the key project impacts and the corresponding management measures. **Appendix Y** (Compilation of environmental management measures) provides a compilation of all the environmental management measures for the project.
	n. identification of other environmental impacts (such as protective and sensitive lands, sedimentation and erosion and impacts to water front land) and proposed	**Chapters 8** to **27** (Assessment of potential impact sections within each chapter and environmental management measures section within each chapter).

Desired performance outcome	SEARs requirements	Where addressed in this EIS
	measures for managing and/or mitigating the level of impact;	
	o. an assessment of the cumulative impacts of the project taking into account other projects that have been approved but where construction has not commenced, projects that have commenced construction, and projects that have recently been completed;	**Chapter 27** (Cumulative impacts), **Section 27.2** identifies the projects that have been assessed and may have potential cumulative impacts. Potential cumulative impacts are described in **Section 27.3** and **Section 27.4**.
	p. statutory context of the project as a whole, including: - how the project meets the provisions of the EP&A Act and EP&A Regulation; and - a list of any approvals that must be obtained under any other Act or law before the project may lawfully be carried out;	**Chapter 2** (Assessment process), **Section 2.1** considers the EP&A Act. **Section 2.2** outlines approvals that may be required under other acts. **Appendix B** (Environmental Planning and Assessment Regulation checklist) considers the requirements of clause 228 of the EP&A Regulation.
	q. a chapter that synthesises the environmental impact assessment and provides: - a succinct but full description of the project for which approval is sought; - a description of any uncertainties that still exist around design, construction methodologies and/or operational methodologies and how these will be resolved in the next stages of the project; - a compilation of the impacts of the project that have not been avoided; - a compilation of the proposed measures associated with each impact to avoid or minimise (through design refinements or ongoing management during construction and operation) or offset these impacts; - a compilation of the outcome(s) the proponent will achieve; and	**Chapter 28** (Synthesis of the environmental impact statement), **Section 28.1** and **Section 28.2** provide a succinct description of the project. **Section 28.3** provides a description of the project uncertainties. **Section 28.4** provides a compilation of the key project impacts and the associated environmental management measures. **Section 28.6** provides a compilation of the performance outcomes the proponent will achieve. **Section 28.7** provides the project justification and conclusion.

Desired performance outcome	SEARs requirements	Where addressed in this EIS
	- the reasons justifying carrying out the project as proposed, having regard to the biophysical, economic and social considerations, including ecologically sustainable development and cumulative impacts; and	
	r. relevant project plans, drawings, diagrams in an electronic format that enables integration with mapping and other technical software.	Throughout the environmental impact statement.
	2. The EIS must only include data and analysis that is reasonably needed to make a decision on the proposal. Relevant information must be succinctly summarised in the EIS and included in full in appendices. Irrelevant, conflicting or duplicated information must be avoided.	Throughout the environmental impact statement.
3. Assessment of key issues Key issue impacts are assessed objectively and thoroughly to provide confidence that the project will be constructed and operated within acceptable levels of impact. * Key issues are nominated by the Proponent in the CSSI project application and by the Department in the SEARs. Key issues need to be reviewed throughout the preparation of the EIS to ensure any new key issues that emerge are captured. The	1. The level of assessment of likely impacts must be proportionate to the significance of, or degree of impact on, the issue, within the context of the proposal location and the surrounding environment. The level of assessment must be commensurate to the degree of impact and sufficient to ensure that the Department and other government agencies are able to understand and assess impacts	**Chapters 8** to **27** of the environmental impact statement.
	2. For each key issue the Proponent must: a. describe the biophysical and socio-economic environment, as far as it is relevant to that issue, including adequate baseline data, in terms of temporal, spatial and parameters monitored;	**Chapters 8** to **27** of the environmental impact statement (Existing environment section within each chapter, where relevant).
	b. describe the legislative and policy context, as far as it is relevant to the issue;	**Chapters 8** to **27** of the environmental impact statement (where relevant).

Desired performance outcome	SEARs requirements	Where addressed in this EIS
key issues identified in this document are not exhaustive but are key issues common to most CSSI projects.	c. identify, describe and quantify (if possible) the impacts associated with the issue, including the likelihood and consequence of the impact (comprehensive risk assessment), and the cumulative impacts of: a) concurrent project construction activities; and b) proposed and approved projects (where information is available at the time of writing);	Potential cumulative impacts during construction and operation for individual key issues are discussed in **Chapters 8** to **26,** and collectively described in **Chapter 27** (Cumulative impacts) in **Section 27.3** and **Section 27.4**.
	d. demonstrate how potential impacts have been avoided (through design, or construction or operation methodologies);	**Chapter 4** (Project development and alternatives), **Section 4.4** and **Section 4.5** detail the project design development. **Chapter 5** (Project description), **Section 5.2** and **Section 5.3** detail the key environmental controls that will be provided as part of the project. **Chapter 6** (Construction work) details the construction methods which have been considered, based on project design development and the requirement to minimise impacts on the environment.
	e. detail how likely impacts that have not been avoided through design will be minimised, and the predicted effectiveness of these measures (against performance criteria where relevant); and	**Chapter 28** (Synthesis of the environmental impact statement), **Section 28.3** provides a description of the project uncertainties and the proposed resolutions. **Section 28.4** provides a compilation of the key project impacts and the associated environmental management measures. **Section 28.6** provides the project's performance outcomes as measured against those identified for key impacts in the Secretary's environmental assessment requirements, along with a summary of how each performance outcome would be achieved by the project.
	f. detail how any residual impacts will be managed or offset, and the approach and effectiveness of these measures.	**Chapter 28** (Synthesis of the environmental impact statement), **Section 28.4** provides a compilation of the key project impacts, the associated environmental management measures and a summary of residual impacts. **Appendix C** (Environmental risk analysis) details how any residual impacts will be managed or offset.

Desired performance outcome	SEARs requirements	Where addressed in this EIS
	3. Where multiple reasonable and feasible options to avoid or minimise impacts are available, they must be identified and considered and the proposed measure justified taking into account the public interest.	**Chapter 28** (Synthesis of the environmental impact statement), **Section 28.4** provides a compilation of the key project impacts and the associated environmental management measures.
4. Consultation The project is developed with meaningful and effective engagement during project design and delivery.	1. The project must be informed by consultation, including with relevant local, State and Commonwealth government agencies (including the Harbour Master where disturbance of seabeds, shipping channel closures or marine movement of materials/spoil are proposed), infrastructure and service providers, special interest groups (including Local Aboriginal Land Councils, Aboriginal stakeholders, and pedestrian and bicycle user groups), affected landowners, businesses and the community.	**Chapter 7** (Stakeholder and community engagement), **Section 7.1** and **Section 7.2** provide a summary of consultation carried out to date. A summary of feedback received is provided in **Section 7.3**. A summary of project refinements in response to feedback is provided in **Section 7.4**. Project refinements have also been considered in **Chapter 5** (Project description).
	2. The Proponent must document the consultation process, and demonstrate how the project has responded to the inputs received.	**Chapter 7** (Stakeholder and community engagement) documents the consultation process in **Section 7.1** and **Section 7.2**. A summary of the feedback received and how the feedback has been addressed is provided in **Section 7.3**. A summary of project refinements in response to feedback is also provided in **Section 7.4**. Project refinements have also been considered in **Chapter 5** (Project description).
	3. The Proponent must describe the timing and type of community consultation proposed during the design and delivery of the project, the mechanisms for community feedback, the mechanisms for keeping the community informed, and procedures for complaints handling and resolution.	**Chapter 7** (Stakeholder and community engagement), **Section 7.2** outlines the community and stakeholder engagement activities carried out to date. Ongoing and future engagement for the project is outlined in **Section 7.5**. A detailed communication and engagement strategy will be developed and implemented during delivery of the project. This will be based on the consultation framework provided in **Appendix E** (Community consultation framework).

Desired performance outcome	SEARs requirements	Where addressed in this EIS
	4. The Proponent must assess the potential for complaint fatigue to occur during construction of the project and describe how mitigation measures, complaint handling procedures and community consultation mechanisms will mitigate complaint fatigue. The assessment must consider the cumulative impacts from the project and other major projects in the area.	**Chapter 7** (Stakeholder and community engagement), **Section 7.5**.describes the potential for complaint fatigue to occur and proposed mitigation measures and complaint handling procedures. **Chapter 27** (Cumulative impacts), **Section 27.3.7** describes the potential impacts of construction and complaint fatigue.
Key Issues		
1. Transport and traffic Network connectivity, safety and efficiency of the transport system in the vicinity of the project are managed to minimise impacts. The safety of transport system customers is maintained. Impacts on network capacity and the level of service are effectively managed. Works are compatible with existing infrastructure and future transport corridors.	1. The Proponent must assess construction transport and traffic (vehicle, marine, pedestrian and cyclists) impacts, including, but not necessarily limited to:	
	a. a considered approach to route identification and scheduling of marine and land transport movements, particularly outside standard construction hours;	**Chapter 6** (Construction work), **Section 6.8** and **Section 6.9** show the land and maritime construction traffic/vessel movements for each temporary construction support site, as well as the operating hours of each site. Construction traffic routes are discussed in **Chapter 8** (Construction traffic and transport), **Section 8.4** discusses the proposed marine and land transport movements. **Chapter 23** (Hazards and risks), **Section 23.2.4** and **Section 23.3.4** consider the interactions between maritime traffic and tunnel infrastructure during construction and operation. Note: temporary construction support sites have been positioned adjacent to major arterial roads to minimise the use of local roads.
	b. the number, frequency and size of construction related vehicles (passenger, marine, commercial and heavy vehicles, including spoil management movements);	Construction traffic movements information is presented in **Chapter 6** (Construction work), **Section 6.9** which outlines the number, frequency and size of construction vehicles.
	c. construction worker parking;	Temporary construction support site layouts, including provision of construction worker parking, are presented in **Chapter 6** (Construction work), **Section 6.8**.

Desired performance outcome	SEARs requirements	Where addressed in this EIS
		Construction worker parking is detailed in **Chapter 8** (Construction traffic and transport), **Section 8.4**.
	d. the nature of existing traffic (types and number of movements) on construction access routes (including consideration of peak traffic times and sensitive road users and parking arrangements;	The nature of existing traffic is detailed in **Chapter 8** (Construction traffic and transport), **Section 8.3**. The assessment of potential traffic impacts during construction are detailed in **Section 8.4**.
	e. access constraints and impacts on public transport, pedestrians and cyclists;	Access constraints and impacts on public transport, pedestrians and cyclists during construction are described in **Chapter 8** (Construction traffic and transport), **Section 8.4**. **Chapter 21** (Socio-economics), **Section 21.4** describes potential impacts on access during construction.
	f. how construction of the project affects the capacity of, and the need to close, divert or otherwise reconfigure elements of, the road, cycle and pedestrian network;	**Chapter 8** (Construction traffic and transport), **Section 8.4** details impacts during construction on road, cycle and pedestrian networks.
	g. details of how construction and scheduling of works are to be coordinated in regard to public events and cumulative traffic impacts resulting from concurrent work on the project and other major projects, under or preparing for or commencing construction in the vicinity of the proposal;	Coordination with respect to public events is discussed in **Chapter 8** (Construction traffic and transport), **Section 8.4.8**. Cumulative construction impacts are also assessed in **Section 8.4.6** and **Section 8.4.7**.
	h. alternatives to road transport of construction spoil including marine and rail options as well as potential re-use in existing land reclamation areas or in association with Resource Recovery Exceptions (if obtained from the EPA) to minimise traffic impacts on the road network;	**Chapter 4** (Project development and alternatives), **Section 4.5** presents the spoil transport alternatives and reuse and disposal alternatives which were considered. **Chapter 6** (Construction work), **Section 6.8** and **Section 6.9** discuss construction spoil transport. **Chapter 8** (Construction traffic and transport), **Section 8.4.3** discusses impacts from marine spoil transport. Potential reuse of spoil is addressed in **Chapter 24** (Resource use and waste management).

Desired performance outcome	SEARs requirements	Where addressed in this EIS
	i. the likely risks of the project to public safety, paying particular attention to pedestrian safety and users of Middle Harbour; and	**Chapter 8** (Construction traffic and transport), **Section 8.4** provides an assessment of the potential traffic impacts during construction for pedestrians and users of Middle Harbour. **Chapter 23** (Hazards and risks), **Section 23.2.4** and **Section 23.3.4** assess the interactions between maritime traffic and tunnel infrastructure.
	j. impacts to water based traffic on Middle Harbour.	**Chapter 8** (Construction traffic and transport), **Section 8.4.3** assesses the impacts to water based traffic and shipping channels during construction.
	2. The Proponent must assess and model the operational transport impacts of the project including, but not necessarily limited to:	
	a. forecast travel demand and traffic volumes (expressed in terms of total numbers and heavy and light vehicle numbers) for the project and the surrounding road, cycle and public transport network, including potential shifts of traffic movements on alternate routes outside the proposal area (such as toll avoidance) and impact of permanent street closures directly attributable to the SSI;	**Chapter 9** (Operational traffic and transport), **Section 9.4** discusses operational traffic and transport impacts for the project and surrounding network**.** Further detail on forecast traffic volumes is provided in **Appendix F** (Technical working paper: Traffic and transport).
	b. accessibility impacts in commercial centres within the vicinity of the project;	**Chapter 21** (Socio-economics), **Section 21.5** assesses the accessibility impacts during operation. Forecast 30-minute catchments by road for strategic centres in the vicinity of the project are provided in **Appendix F** (Technical working paper: Traffic and transport).
	c. travel time analysis;	**Chapter 9** (Operational traffic and transport), **Section 9.4** provides an assessment of the impact of the project on travel times during operation.

Desired performance outcome	SEARs requirements	Where addressed in this EIS
	d. performance of key interchanges and intersections by undertaking a level of service analysis at key locations;	**Chapter 9** (Operational traffic and transport), **Section 9.4** outlines interchange and intersection performance during operation.
	e. wider transport interactions (local and regional roads, cycling, public and freight transport);	**Chapter 3** (Strategic context and project need) **Section 3.4**, **Section 3.5** and **Section 3.6** describe the relationship and/or integration of the project with existing and proposed public transport and freight transport services. **Chapter 9** (Operational traffic and transport), **Section 9.1** outlines how the project considers specific transport strategies. **Section 9.4** provides an assessment of future traffic and transport interactions.
	f. induced traffic and operational implications for existing and proposed public transport (particularly with respect to strategic bus corridors and bus routes and permanent closure/relocation of bus stops) and consideration of opportunities to improve public transport;	**Chapter 9** (Operational traffic and transport), **Section 9.4** discusses implications and impacts to public transport.
	g. impacts on cyclists and pedestrian access and safety;	**Chapter 9** (Operational traffic and transport), **Section 9.4** outlines impacts to pedestrians and cyclists, including access and safety.
	h. property and business access and on street parking; and	**Chapter 9** (Operational traffic and transport), **Section 9.4** describes road network changes and access arrangements. **Chapter 21** (Socio-economics), **Section 21.5** describes operational impacts to properties and businesses.
	i. an explanation for the scope of the modelled area, including justification of the nominated boundaries.	**Chapter 9** (Operational traffic and transport), **Section 9.2** presents the assessment methodology of operational traffic and transport impacts.

Desired performance outcome	SEARs requirements	Where addressed in this EIS
2. Air Quality The project is designed, constructed and operated in a manner that minimises air quality impacts (including nuisance dust and odour) to minimise risks to human health and the environment to the greatest extent	1. The Proponent must undertake an air quality impact assessment (AQIA) for construction and operation of the project in accordance with the current guidelines.	**Chapter 12** (Air quality) outlines the impacts of the construction and operation of the project on air quality, as detailed in **Section 12.5** and **Section 12.6** respectively.
	2. The Proponent must ensure the AQIA also includes the following:	
	a. demonstrated ability to comply with the relevant regulatory framework, specifically the *Protection of the Environment Operations Act 1997* and the *Protection of the Environment Operations (Clean Air) Regulation 2010*;	**Chapter 12** (Air quality), **Section 12.1** outlines information with respect to the *Protection of the Environment Operations Act 1997* and the Protection of the Environment Operations (Clean Air) Regulation 2010.
	b. the identification of all potential sources of air pollution including details of the location, configuration and design of all potential emission sources including ventilation systems and tunnel portals;	**Chapter 12** (Air quality), **Section 12.2** sets out the methodology for identifying all potential sources of air pollution. Details of potential sources of air pollution are provided in **Section 12.4**, **Section 12.5** and **Section 12.6**. The configuration and design of ventilation systems and tunnel portals are shown in **Chapter 5** (Project description).
	c. a review of vehicle emission trends and an assessment that uses or sources best available information on vehicle emission factors;	**Chapter 12** (Air quality), **Section 12.4** provides the best available information on vehicle emission trends.
	d. an assessment of impacts (including human health impacts) from potential emissions of PM_{10}, $PM_{2.5}$, CO, NO_2 and other nitrogen oxides and volatile organic compounds (eg BTEX) including consideration of short and long term exposure periods;	**Chapter 12** (Air quality), **Section 12.6** provides an assessment of impacts (including human health impacts) of air pollutants during short and long term exposure periods. Impacts to human health due to the operation of the project are provided in **Chapter 13** (Human health), **Section 13.5**.

Desired performance outcome	SEARs requirements	Where addressed in this EIS
	e. consider the impacts from the dispersal of these air pollutants on the ambient air quality along the proposal route, proposed ventilation outlets and portals, surface roads, ramps and interchanges and the alternative surface road network;	**Chapter 12** (Air quality), **Section 12.6** provides an assessment of impacts from the dispersal of air pollutants on ambient air quality along the project alignment.
	f. a qualitative assessment of the redistribution of ambient air quality impacts compared with existing conditions, due to the predicted changes in traffic volumes;	**Chapter 12** (Air quality), **Section 12.6.3** presents a qualitative assessment of the redistribution of ambient air quality impacts in comparison to existing conditions.
	g. assessment of worst case scenarios for in-tunnel and ambient air quality, including a range of potential ventilation scenarios and range of traffic scenarios, including worst case design maximum traffic flow scenario (variable speed) and worst case breakdown scenario, and discussion of the likely occurrence of each;	**Chapter 12** (Air quality), **Section 12.6** outlines the assessment of in-tunnel air quality in addition to the assessment of issues related to ambient air quality.
	h. details of the proposed tunnel design and mitigation measures to address in-tunnel air quality and the air quality in the vicinity of portals and any mechanical ventilation systems (ie ventilation outlets and air inlets) including details of proposed air quality monitoring (including frequency and criteria);	Details of the proposed tunnel design are presented in **Chapter 5** (Project description), while mitigation and management measures in relation to in-tunnel air quality and air quality in the vicinity of portals and ventilation systems are outlined in **Chapter 12** (Air quality), **Section 12.7**.
	i. a demonstration of how the project and ventilation design ensures that concentrations of air emissions meet NSW, national and international best practice for in-tunnel and ambient air quality, and taking into consideration the approved criteria for the M4 East project, New M5 project and the In-Tunnel Air Quality (Nitrogen Dioxide) Policy;	Information relating to the design standard of the proposed ventilation system for the project are set out in **Chapter 5** (Project description). Criteria applied in this assessment are discussed in **Chapter 12** (Air quality), **Section 12.1** and **Section 12.3**. The project and its ventilation systems have been designed to meet in-tunnel criteria and ambient air quality goals and criteria as outlined in **Chapter 12** (Air quality), **Section 12.6**.

Desired performance outcome	SEARs requirements	Where addressed in this EIS
	j. details of any emergency ventilation systems, such as air intake/exhaust outlets, including protocols for the operation of these systems in emergency situations, potential emission of air pollutants and their dispersal, and safety procedures;	Details of emergency ventilation systems, operating protocols and safety procedures are presented in **Chapter 5** (Project description).
	k. details of in-tunnel air quality control measures considered, including air filtration, and justification of the proposed measures or for the exclusion of other measures;	Details of in-tunnel air quality control measures considered and justification of the proposed measures or for the exclusion of other measures are outlined in **Chapter 12** (Air quality), **Section 12.7** and expanded upon in **Chapter 5** (Project description). **Chapter 4** (Project development and alternatives), **Section 4.5** discusses the ventilation system design alternatives considered.
	l. a description and assessment of the impacts of potential emissions sources relating to construction, including details of the proposed mitigation measures to prevent the generation and emission of dust (particulate matter and TSP) and air pollutants (including odours) during the construction of the proposal, particularly in relation to ancillary facilities (such as concrete batching plants), dredge and tunnel spoil handling and storage, the use of mobile plant, stockpiles and the processing and movement of spoil; and	**Chapter 12** (Air quality), **Section 12.5** provides a description and assessment of the impacts of potential emissions sources relating to construction, while mitigation measures to prevent the generation and emission of dust and other air pollutants (including odours) are presented in **Section 12.7**.
	m. a cumulative assessment of the in-tunnel, local and regional air quality impacts from the operation of the project and due to the operation of and potential continuous travel through motorway tunnels and surface roads.	A cumulative assessment of the in-tunnel, local and regional air quality impacts are outlined within **Chapter 12** (Air quality), **Section 12.6.**

Desired performance outcome	SEARs requirements	Where addressed in this EIS
3. Health and Safety The project avoids or minimises any adverse health impacts arising from the project. The project avoids, to the greatest extent possible, risk to public safety.	1. The Proponent must assess the potential health risks from the construction and operation of the project.	**Chapter 13** (Human health), **Section 13.4** and **Section 13.5** describe the potential human health risks from the construction and operation of the project.
	2. The assessment must: a. describe the current known health status of the potentially affected population;	**Chapter 13** (Human health), **Section 13.3** describes the potentially affected communities and their current health status.
	b. describe how the design of the proposal minimises adverse health impacts and maximises health benefits;	**Chapter 5** (Project description), **Section 5.2.7** describes the tunnel ventilation systems which manage in-tunnel air quality to protect human health and amenity, and manage fire and smoke in the event of a tunnel incident. **Section 2.3** of **Appendix I** (Technical working paper: Health impact assessment) outlines how health issues have been considered in project design.
	c. assess human health risks from the operation and use of the tunnel under a range of conditions, including worst case operating conditions and the potential length of motorway tunnels in Sydney;	**Chapter 13** (Human health), **Section 13.5** assesses the human health risks associated with the operation and use of the project.
	d. human health risks and costs associated with the construction and operation of the proposal, including those associated with air quality, odours, noise and vibration (including residual noise following application of mitigation measures), construction fatigue, and social impacts (including from acquisitions) on the adjacent and surrounding areas as well as opportunity costs (such as those from social infrastructure and active transport impacts) during the construction and operation of the proposal;	**Chapter 13** (Human health), **Section 13.4** and **Section 13.5** outline the construction and operational impacts including those related to air quality, noise and vibration, construction fatigue, social impacts and cumulative impacts associated with the project. **Appendix I** (Technical working paper: Health impact assessment) includes consideration of opportunity costs for particulates, noting there are no methods to quantify health costs other than particulates.
	e. include both incremental changes in exposure from existing background pollutant levels and the cumulative impacts of project specific and existing pollutant levels at the location of the most exposed receivers and other sensitive receptors (including public open space areas child care centres, schools, hospitals and aged care facilities);	**Chapter 13** (Human health), **Section 13.5** discusses health related air quality impacts during operation, including cumulative impacts.

Desired performance outcome	SEARs requirements	Where addressed in this EIS
	f. assess the likely risks of the project to public safety, paying particular attention to pedestrian safety, subsidence risks, bushfire risks and the handling and use of dangerous goods;	**Chapter 8** (Construction traffic and transport), **Section 8.4** and **Chapter 9** (Operational traffic and transport), **Section 9.4** provide an assessment of potential traffic impacts for pedestrians and users of Middle Harbour. **Chapter 13** (Human health), **Section 13.4** and **Section 13.5** consider pedestrian/public safety during construction and operation. **Chapter 16** (Geology, soils and groundwater), **Section 16.4.2** considers potential ground movement (subsidence) impacts. **Chapter 23** (Hazards and risks), **Section 23.2.1** and **Section 23.2.6** include assessments of handling and use of dangerous goods and bushfire risk, respectively, during construction. **Section 23.3.1** and **Section 23.3.5** include assessments of handling and use of dangerous goods and bushfire risk, respectively, during operation. Ground movement due to construction activities is also discussed in **Section 23.2.3**. **Section 23.3.3** provides an assessment of the impacts of potential traffic incidents during operation.
	g. assess the opportunities for health improvement;	**Chapter 13** (Human health) outlines the beneficial impacts associated with the project in **Section 13.4** and **Section 13.5**.
	h. assess the distribution of the health risks and benefits; and	**Chapter 13** (Human health) presents the distribution of health related risks and benefits in **Section 13.4** and **Section 13.5**. Consideration of the distribution of noise and air quality impacts are presented in **Chapter 10** (Construction noise and vibration), **Chapter 11** (Operational noise and vibration) and **Chapter 12** (Air quality).
	i. include a cumulative human health risk assessment inclusive of in-tunnel, local and regional impacts due to the operation of and potential continuous travel through motorway tunnels and surface roads.	**Chapter 13** (Human health), **Section 13.5.1** and **Section 13.5.2** discuss health related air quality impacts.

Desired performance outcome	SEARs requirements	Where addressed in this EIS
4. Noise and Vibration – Amenity Construction noise and vibration (including airborne noise, ground-borne noise and blasting) are effectively managed to minimise adverse impacts on acoustic amenity. Increases in noise emissions and vibration affecting nearby properties and other sensitive receivers during operation of the project are effectively managed to protect the amenity and well-being of the community.	1. The Proponent must assess construction and operational noise and vibration impacts in accordance with relevant NSW noise and vibration guidelines. The assessment must take into consideration and address the redistribution of traffic (including on local feeder roads) and operational plant and equipment and must include consideration of impacts to sensitive receivers and include consideration of sleep disturbance and, as relevant, the characteristics of noise and vibration (for example, low frequency noise).	**Chapter 10** (Construction noise and vibration), **Section 10.4** outlines the relevant NSW noise and vibration guidelines informing the construction noise and vibration assessment. **Chapter 11** (Operational noise and vibration), **Section 11.5** documents the impacts from the redistribution of traffic (including on local feeder roads) and operational plant and equipment.
	2. An assessment of construction noise and vibration impacts which must address: a. the nature of construction activities (including transport, tonal or impulsive noise-generating works and the removal of operational noise barriers, as relevant);	The nature of construction activities and potential noise and vibration impacts are outlined in **Chapter 10** (Construction noise and vibration), **Section 10.6** and **a**dditional detail is provided in **Appendix G** (Technical working paper: Noise and vibration).
	b. the intensity and duration of noise and vibration impacts (both air and ground borne). This must include consideration of extended construction impacts associated with ancillary facilities (and the like) and construction fatigue;	The intensity and duration of noise and vibration impacts are described in **Chapter 10** (Noise and vibration), **Section 10.6** and additional detail is available in provided within **Appendix G** (Technical working paper: Noise and vibration). Construction fatigue is also discussed in **Chapter 27** (Cumulative impacts).
	c. the identification of receivers, existing and likely, during the construction period;	**Chapter 10** (Construction noise and vibration), **Section 10.5** identifies receivers, both existing and likely, while **Section 10.6** outlines the potential impacts on receivers.
	d. the nature, sensitivity and impact to receivers;	**Chapter 10** (Construction noise and vibration), **Section 10.5** and **Section 10.6** present information on the nature, sensitivity and impact on receivers.
	e. the need to balance timely conclusion of noise and vibration-generating works with periods of receiver respite, and other factors that may influence the timing and duration of construction activities (such as traffic management);	Information regarding the need to balance timely conclusion of noise and vibration-generating works with periods of receiver respite, and other factors that may influence the timing and duration of construction activities (such as traffic management) is outlined in **Chapter 10** (Construction noise and vibration), **Section 10.6** and **Appendix G** (Technical working paper: Noise and vibration).

Desired performance outcome	SEARs requirements	Where addressed in this EIS
	f. the potential for works outside standard construction hours, including predicted levels, exceedances, number of potentially affected receivers, and justification for the activity in terms of the Interim Construction Noise Guideline (DECCW, 2009);	**Chapter 10** (Construction noise and vibration), **Section 10.6** and **Appendix G** (Technical working paper: Noise and vibration) present details on the potential (and parameters) for works outside of standard construction hours.
	g. a cumulative noise and vibration assessment inclusive of impacts from the project (including concurrent project construction activities);	**Chapter 10** (Construction noise and vibration), **Section 10.6** and **Appendix G** (Technical working paper: Noise and vibration) present detail on the cumulative noise and vibration assessment inclusive of impacts from the project (including concurrent project construction activities). **Chapter 27** (Cumulative impacts) assesses the cumulative construction noise and vibration impacts generated by major projects, including the Western Harbour Tunnel and Warringah Freeway Upgrade project.
	h. a cumulative noise and vibration assessment of the impacts from the project and the construction of other relevant development in the vicinity of the proposal;	**Chapter 10** (Construction noise and vibration), **Section 10.6** and **Appendix G** (Technical working paper: Noise and vibration) present detail on the cumulative noise and vibration assessment of impacts from the project and the construction of other relevant development in the vicinity of the project. **Chapter 27** (Cumulative impacts) assesses the cumulative construction noise and vibration impacts associated with the project and other relevant developments in the vicinity of the project.
	i. details and analysis of the effectiveness of mitigation measures to adequately manage identified impacts, including cumulative impacts as identified in (g) and (h) and a clear identification of residual noise and vibration following application of mitigation measures; and	**Chapter 10** (Construction noise and vibration), **Section 10.6** and **Appendix G** (Technical working paper: Noise and vibration) present details and analysis of the effectiveness of mitigation measures (as outlined in **Section 10.7**) to adequately manage identified impacts, including cumulative impacts, and a clear identification of residual noise and vibration following the application of such measures. **Chapter 27** (Cumulative impacts) details the environmental management measures relating to cumulative impacts.

Desired performance outcome	SEARs requirements	Where addressed in this EIS
	j. a description of how community preferences have been taken into account in the design of mitigation measures and consider tailored mitigation, management and communication strategies for vulnerable community members.	**Appendix E** (Community consultation framework) presents details of how community preferences will be taken into account in the design of mitigation measures and commitments.
	3. The Proponent must demonstrate that blast impacts are capable of complying with the current guidelines, if blasting is required.	**Chapter 10** (Construction noise and vibration), **Section 10.4** and **Section 10.6** outline how blast impacts will comply to relevant guidelines.
5. Noise and Vibration – Structural Construction noise and vibration (including airborne noise, ground-borne noise and blasting) are effectively managed to minimise adverse impacts on the structural integrity of buildings and items including Aboriginal places and environmental heritage. Increases in noise emissions and vibration affecting environmental heritage as defined in *the Heritage Act 1977* during operation of the project are effectively managed.	1. The Proponent must assess construction and operation noise and vibration impacts in accordance with relevant NSW noise and vibration guidelines. The assessment must include consideration of impacts to the structural integrity and heritage significance of items (including Aboriginal places and items of environmental heritage).	**Chapter 10** (Construction noise and vibration), **Section 10.6** and **Appendix G** (Technical working paper: Noise and vibration) present detail on the assessment of construction and operational noise and vibration impacts in respect to relevant NSW noise and vibration guidelines as well as the consideration of impacts on the structural integrity of buildings and heritage items. **Chapter 11** (Operational noise and vibration), **Section 11.2** and **Section 11.7** present information with respect to the operational phase. **Chapter 14** (Non-Aboriginal heritage), **Section 14.4** provides an assessment of impacts to items of significance as a result of vibration. **Chapter 15** (Aboriginal heritage), **Section 15.4** provides an assessment of impacts to items of significance as a result of vibration.
	2. The Proponent must demonstrate that blast impacts are capable of complying with the current guidelines, if blasting is required.	**Chapter 10** (Construction noise and vibration), **Section 10.4** and **Section 10.6** outline how blast impacts would comply with relevant guidelines.

Desired performance outcome	SEARs requirements	Where addressed in this EIS
6. Biodiversity The project design considers all feasible measures to avoid and minimise impacts on terrestrial and aquatic biodiversity. Offsets and/or supplementary measures are assured which are equivalent to any remaining impacts of project construction and operation.	1. Biodiversity impacts related to the proposal are to be assessed in accordance with the Biodiversity Assessment Method and documented in a Biodiversity Development Assessment Report (BDAR).	Biodiversity impacts related to the project are outlined in **Chapter 19** (Biodiversity), **Section 19.5** and documented in detail in **Appendix S** (Technical working paper: Biodiversity development assessment report).
	2. The BDAR must include information in the form detailed in the *Biodiversity Conservation Act 2016* (s. 6.12), *Biodiversity Conservation Regulation 2017* (s 6.8) and Biodiversity Assessment Method (BAM) including details of the measures proposed to address the offset obligation as follows: a. the total number and classes of biodiversity credits required to be retired for the developments/project; b. the number of classes of like-for-like biodiversity credits proposed to be retired; c. the number and classes of biodiversity credits proposed to be retired in accordance with the variation rules; d. any proposal to fund a biodiversity conservation action; and e. any proposal to make a payment to the Biodiversity Conservation Fund.	The Biodiversity development assessment report is provided in **Appendix S** (Technical working paper: Biodiversity development assessment report) and provides details of biodiversity offsets and credits addressing requirements a to e.
	3. The BDAR must document the application of the avoid, minimise and offset framework including assessing all direct, indirect and prescribed impacts in accordance with the BAM.	**Appendix S** (Technical working paper: Biodiversity development assessment report), **Section 4** and **Section 5** document the application of the avoid, minimise and offset framework.
	4. If requesting the application of the variation rules, the BDAR must contain details of the reasonable steps that have been taken to attempt to obtain the required like-for-like biodiversity credits.	Not applicable.
	5. The BDAR must include all spatial data associated with the survey and assessments as per Appendix 11 of the BAM.	**Appendix S** (Technical working paper: Biodiversity development assessment report) includes required spatial data.

Desired performance outcome	SEARs requirements	Where addressed in this EIS
	6. The BDAR must be prepared by a person accredited in accordance with the *Accreditation scheme for the Application of the Biodiversity Assessment Method Order 2017* under s. 6.10 of the *Biodiversity Conservation Act 2016*.	Evidence that the Biodiversity Development Assessment Report has been prepared in accordance with the *Accreditation scheme for the Application of the Biodiversity Assessment Method Order 2017* is provided in **Appendix S** (Technical working paper: Biodiversity development assessment report).
	7. In accordance with section 9.1 and 9.2 of the BAM the BDAR must assess all direct and indirect impacts of the proposal on native vegetation, threatened ecological communities and threatened species habitat.	**Chapter 19** (Biodiversity), **Section 19.5** provides an assessment of biodiversity impacts related to the project with further detail provided in **Appendix S** (Technical working paper: Biodiversity development assessment report).
	8. Impacts on biodiversity values that cannot be assessed using the BAM must also be otherwise assessed. The values include: a. marine mammals; b. wandering seabirds; and c. matters of national significance listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.	**Chapter 19** (Biodiversity), **Section 19.5** provides an assessment of biodiversity impacts related to the project with further detail provided in **Appendix S** (Technical working paper: Biodiversity development assessment report).
	9. Species declared as threatened under the *Biodiversity Conservation Act 2016* and recorded recently (since 1990) within approximately 1.5 kilometres of the project's development corridor should be considered as likely to be affected by the proposal.	**Chapter 19** (Biodiversity), **Section 19.5** provides an assessment of the impacts to threatened species. Consideration of species recently recorded within 1.5 kilometres of the construction footprint are documented in **Appendix S** (Technical working paper: Biodiversity development assessment report).
	10. Identify and assess the impact of tidal flushing on the crossing of Middle Harbour. This assessment should also include details of any potential sediment accumulation and the impact this may have on marine populations that dwell on the harbour floor.	**Chapter 19** (Biodiversity), **Section 19.5** provides an assessment of the impacts of tidal flushing, including low dissolved oxygen and sedimentation on marine populations. This is further discussed in **Appendix T** (Technical working paper: Marine ecology).

Desired performance outcome	SEARs requirements	Where addressed in this EIS
7. Place Making and Urban Design The project design complements the visual amenity, character and quality of the surrounding environment. The project contributes to the accessibility and connectivity of communities.	1. The Proponent must identify how functional 'place' outcomes of public benefit will be achieved, including design principles and strategies that:	**Chapter 22** (Urban design and visual amenity), **Section 22.2** provides the principles that identifies how functional 'place' outcomes of public benefit would be achieved (with respect to requirements a to h). These are further discussed in **Appendix V** (Technical working paper: Urban design, landscape character and visual impact). Justification for the location of ancillary facilities is provided in **Chapter 4** (Project development and alternatives), **Chapter 5** (Project description) and **Chapter 6** (Construction work).
	a. consider areas identified for future urban renewal;	
	b. capitalise on reduced traffic volumes and the reduction of traffic permeation, particularly in and around commercial and community centres	
	c. avoid locating infrastructure, including ancillary facilities, adjoining residential areas and other sensitive receivers, and justify where this cannot be achieved;	
	d. achieve high quality landscaping, streetscapes, architecture and design;	
	e. identify urban design strategies and opportunities that will enhance healthy, cohesive and inclusive communities, including in relation to accessibility and connectivity	
	f. consider resulting residual land treatments, and demonstrate how the proposed hard and soft urban design elements of the proposal would be consistent with the existing and desired future character of the area traversed or affected by the proposal;	
	g. identify opportunities to utilise surplus or residual land, particularly for the provision of community space (passive and recreational) and utilise key structures (such as ventilation outlets) for multiple uses i.e. integration with other structures; and	

Desired performance outcome	SEARs requirements	Where addressed in this EIS
	h. explore the use of Crime Prevention Through Environmental Design (CPTED) principles during the design development process, including natural surveillance, lighting, walkways, signage and landscape.	
	2. The Proponent must describe the accessibility elements of the proposal including relevant accessibility legislation and guidelines, including: a. impacts on public transport infrastructure and services; b. impacts on pedestrian and cyclist access and safety across and adjoining the proposal; and c. opportunities to integrate and enhance accessibility including the provisions public and active transport infrastructure as a result of the proposal.	**Chapter 5** (Project description), **Section 5.2** and **Section 5.3** describe the proposed public and active transport infrastructure that would be provided by the project. **Chapter 8** (Construction traffic and transport), **Section 8.4** assesses the impacts of construction of the project on pedestrian and cyclist access and safety as well as impacts on public transport infrastructure and services. **Chapter 22** (Urban design and visual amenity), **Section 22.1** provides a high-level outline of legislation and guidelines relevant to the assessment of visual amenity and landscape impacts.
	3. The Proponent must assess the visual and landscape impacts of the proposal, including ancillary infrastructure on: a. views and vistas; b. streetscapes, key sites and buildings; c. landscaping, green spaces and existing trees and tree canopy, including an assessment of likely magnitude of impacts to trees and need for removal to be undertaken by an arborist, including the provision of measures to minimise and offset impacts; d. heritage items including Aboriginal places, environmental heritage; and areas of heritage sensitivity; and e. the local community.	**Chapter 22** (Urban design and visual amenity) provides the visual and landscape impacts of the proposal, including associated ancillary infrastructure (with respect to requirements a, b, d, and e), in **Section 22.5** and **Section 22.6**. Artist impressions and perspective drawings of the project from key receiver locations are also provided in these sections. The potential removal of trees and likely magnitude of impacts to trees is assessed in **Appendix W** (Technical working paper: Arboricultural impact assessment). The information contained within **Appendix W** (Technical working paper: Arboricultural impact assessment) has been considered within the landscape character and visual impact assessment. **Chapter 14** (Non-Aboriginal heritage), **Section 14.4** assesses the impacts related to non-Aboriginal heritage. **Chapter 15** (Aboriginal cultural heritage), **Section 15.4** assesses the impacts related to Aboriginal cultural heritage.

Desired performance outcome	SEARs requirements	Where addressed in this EIS
	4. The Proponent must provide artist impressions and perspective drawings of the proposal from key receiver locations to illustrate the proposal and its visual impacts.	**Chapter 22** (Urban design and visual amenity), **Section 22.6** and **Appendix V** (Technical working paper: Urban design, landscape character and visual impact) include artist impressions and perspective drawings of the project from key receiver locations.
8. Socio-economic, Land Use and Property The project minimises adverse social and economic impacts and capitalises on opportunities potentially available to affected communities. The project minimises impacts to property and business and achieves appropriate integration with adjoining land uses, including maintenance of appropriate access to properties and community facilities, and minimisation of displacement of existing land use activities, dwellings and infrastructure	1. The Proponent must assess social and economic impacts (of all phases of the project) in accordance with the current guidelines (including cumulative construction and operational impacts of the proposal and major projects in the vicinity of the project) and in consultation with relevant land owners (such as the Ports Authority of NSW and those land owners whose property is being acquired).	**Chapter 7** (Stakeholder and community engagement) presents the engagement and consultation activities carried out to date and planned future consultation. **Chapter 21** (Socio-economics) presents an assessment of the socio-economic impacts as a result of the project in **Section 21.4** and **Section 21.5**. Stakeholder consultation is discussed in **Section 21.2**. **Chapter 27** (Cumulative impacts) assesses the cumulative construction and operational impacts of the project and major projects in the vicinity of the project.
	2. The Proponent must assess impacts from construction and operation on potentially affected properties, businesses, recreational users and land and water users, including amenity impacts (including from cumulative and extended construction time frames and construction fatigue), property acquisitions/adjustments, future land uses, access, relevant statutory rights, and community severance and barrier impacts resulting from the project.	**Chapter 7** (Stakeholder and community engagement) presents the engagement and consultation activities carried out to date and planned future consultation. **Chapter 20** (Land use and property), **Section 20.4** discusses impacts to properties, including property acquisitions and future land uses during construction and operation. **Chapter 21** (Socio-economics), **Section 21.4** and **Section 21.5** present the socio-economic impacts as a result of the project. Stakeholder consultation is discussed in **Section 21.2**. **Chapter 27** (Cumulative impacts) assesses the cumulative construction and operational impacts of the project and major projects in the vicinity of the project.

Desired performance outcome	SEARs requirements	Where addressed in this EIS
	3. Where an immersed tube method (IMT) of construction is proposed for use in Middle Harbour, the Proponent must: a. provide details of how reductions to current Harbour depths will be avoided;	The immersed tube tunnel construction methodology is presented in **Chapter 6** (Construction work). Details of the tunnelling method alternatives considered for the crossing of Middle Harbour are included in **Chapter 4** (Project development and alternatives). An assessment of the project on navigable water depths is provided in **Section 7.8** and Annexure A of **Appendix F** (Technical working paper: Traffic and transport).
	b. provide details confirming the level of protection for the IMTs will be similar to or better than that of the existing Sydney Harbour Tunnel;	**Chapter 6** (Construction work), **Section 6.4** provides details confirming the level of detail of protection for the immersed tube tunnels.
	c. identify impacts to ship scheduling in consultation and agreement with the Harbour Master; and	**Chapter 8** (Construction traffic and transport) and **Chapter 9** (Operational traffic and transport) outline impacts related to the construction and operation of the immersed tube tunnels in **Section 8.4** and **Section 9.4** respectively. **Section 8.5** specifies the consultation requirements with the Harbour Master to minimise impacts during construction. **Chapter 21** (Socio-economics), **Section 21.4** and **Section 21.5** and **Appendix U** (Technical working paper: Socio-economic assessment) discuss impacts to maritime businesses and marine vessels, including access.
	d. provide details of full mission simulation which takes in account, movement of tunnel units past Spit Bridge and within Middle Harbour.	**Chapter 8** (Construction traffic and transport), **Section 8.4** presents the outcomes of the simulation report which shows that transportation of the immersed tube tunnel units into and within Middle Harbour would be feasible and could be carried out safely.
	4. The Proponent must assess potential impacts on utilities (including communications, electricity, gas, fuel and water and sewerage) and the relocation of these utilities.	**Chapter 6** (Construction work) details utilities impacted during construction. **Chapter 5** (Project description), **Section 5.2** and **Section 5.3** outline utilities and services management for the project. **Appendix D** (Utilities management strategy) provides a detailed description of utilities likely to be impacted and a framework for utility installations, relocations, adjustments and protection.

Desired performance outcome	SEARs requirements	Where addressed in this EIS
	5. Where the project is predicted to impact on utilities the Proponent must undertake a utilities management strategy, identifying management options, including relocation or adjustment of the utilities.	**Appendix D** (Utilities management strategy) provides a detailed description of utilities likely to be impacted and a framework for utility management.
	6. A draft Community Consultation Framework must be prepared identifying relevant stakeholders, procedures for distributing information and receiving/responding to feedback and procedures for resolving stakeholder and community complaints during construction and operation. Key issues that must be addressed in the draft Framework include, but are not limited to: a. traffic management (including property access, pedestrian access); b. landscaping/urban design matters; c. construction activities including out of hours work; and d. noise and vibration mitigation and management.	**Chapter 7** (Stakeholder and community engagement), **Section 7.5** outlines the content for the framework and a community consultation framework for the project is provided in **Appendix E** (Community consultation framework).
9. Water – Hydrology Long term impacts on surface water and groundwater hydrology (including drawdown, flow rates and volumes) are minimised. The environmental values of nearby, connected and affected water sources, groundwater and dependent ecological systems including estuarine and marine water (if applicable) are maintained (where values are achieved) or improved and maintained	1. The Proponent must describe (and map) the existing hydrological regime for any surface and groundwater resource (including reliance by users and for ecological purposes and groundwater dependent ecosystems) likely to be impacted by the project, including rivers, streams, wetlands and estuaries as described in Appendix 2 of the *Framework for Biodiversity Assessment – NSW Biodiversity Offsets Policy for Major Projects* (OEH, 2014a).	**Chapter 16** (Geology, soils and groundwater), **Section 16.3.4** presents the hydrological regime for groundwater. **Chapter 17** (Hydrodynamics and water quality), **Section 17.3** outlines the surface water resources likely to be impacted by the project. **Chapter 19** (Biodiversity) provides consideration of relevant biodiversity matters.
	2. The Proponent must prepare a detailed water balance for ground and surface water including the proposed intake and discharge locations (including mapping of these locations), volume, frequency and duration for both the construction and operational phases of the project.	**Chapter 16** (Geology, soils and groundwater), **Section 16.4.5** and **Section 16.5.2** describe the groundwater inflow predictions during construction and operation respectively. **Chapter 17** (Hydrodynamics and water quality) presents the surface water balance for construction and operation in **Section 17.4.5** and **Section 17.5.6** respectively.

Desired performance outcome	SEARs requirements	Where addressed in this EIS
(where values are not achieved). Sustainable use of water resources.	3. The Proponent must assess (and model if appropriate) the impact of the construction and operation of the project and any ancillary facilities (both built elements and discharges) on surface and groundwater hydrology in accordance with the current guidelines, including:	**Chapter 16** (Geology, soils and groundwater) discusses groundwater impacts during construction and operation in **Section 16.4** and **Section 16.5** respectively. **Chapter 17** (Hydrodynamics and water quality) describes surface water hydrological impacts and impacts on natural processes during construction and operation in **Section 17.4** and **Section 17.5** respectively.
	a. natural processes within rivers, wetlands, estuaries, marine waters and floodplains that affect the health of the fluvial, riparian, estuarine or marine system and landscape health (such as modified discharge volumes, durations and velocities), aquatic connectivity water-dependent fauna and flora and access to habitat for spawning and refuge;	**Chapter 18** (Flooding) discusses hydrological impacts on natural processes. **Chapter 19** (Biodiversity), **Section 19.5** assesses surface water and groundwater hydrological impacts on the health of aquatic fauna and flora, aquatic habitats, connectivity and groundwater dependent ecosystems.
	b. impacts from any permanent and temporary interruption of groundwater flow, including the extent of drawdown, barriers to flows, implications for groundwater dependent surface flows, ecosystems and species, groundwater users and the potential for settlement;	**Chapter 16** (Geology, soils and groundwater) discusses the groundwater hydrological impacts associated with construction and operation in **Section 16.4** and **Section 16.5** respectively. **Chapter 19** (Biodiversity) discusses impacts from any permanent and temporary interruption of groundwater flow for ecosystems and species.
	c. changes to environmental water availability and flows, both regulated/licensed and unregulated/rules-based sources including the stormwater harvesting scheme implemented by North Sydney Council at the storage dam at Cammeray Golf Course;	**Chapter 17** (Hydrodynamics and water quality), **Section 17.4.5** and **Section 17.5.6** include an assessment of the changes to environmental water availability and flows (including impacts on the stormwater harvesting scheme implemented by North Sydney Council at the storage dam at Cammeray Golf Course). **Chapter 18** (Flooding) assesses the impacts on flooding and flows.

Desired performance outcome	SEARs requirements	Where addressed in this EIS
	d. direct or indirect increases in erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses;	**Chapter 17** (Hydrodynamics and water quality) provides an assessment of potential impacts on surface water from erosion, siltation, and bank stability in **Section 17.4** and **Section 17.5**. Impacts from scour and erosion on geomorphology are discussed in **Section 17.5.5**. The effects of proposed stormwater and wastewater management on surface water quality are assessed in **Section 17.4.3** and **Section 17.5.3**. Impacts on riparian vegetation are included in **Chapter 19** (Biodiversity).
	e. minimising the effects of proposed stormwater and wastewater management during construction and operation on natural hydrological attributes (such as volumes, flow rates, management methods and re-use options) and on the conveyance capacity of existing stormwater systems where discharges are proposed through such systems; and	**Chapter 17** (Hydrodynamics and water quality), **Section 17.4.3**, **Section 17.4.4** and **Section 17.5.3** include information on wastewater discharge, including volumes and rates of discharge.
	f. measures to mitigate the impacts of the proposal and manage the disposal of produced and incidental water.	**Chapter 17** (Hydrodynamics and water quality), **Section 17.6** details environmental management measures relating to surface water. Water drainage and management infrastructure is detailed in **Chapter 5** (Project description) and **Chapter 6** (Construction work).
	4. The assessment must provide details of the final landform of the sites to be excavated or modified (e.g. portals), including final void management and rehabilitation measures.	**Chapter 22** (Urban design and visual amenity) provides details of the final landform, including management and rehabilitation measures. Landscape treatments for the project are detailed in **Chapter 5** (Project description). The management of voids (shafts and access declines) is detailed in **Chapter 6** (Construction work), **Section 6.4.1**.

Desired performance outcome	SEARs requirements	Where addressed in this EIS
	5. The Proponent must identify any requirements for baseline monitoring of hydrological attributes.	**Chapter 16** (Geology, soils and groundwater) outlines requirements for baseline groundwater monitoring in **Section 16.6** and **Section 16.7**. **Chapter 17** (Hydrodynamics and water quality) describes surface water monitoring carried out to inform this environmental impact statement in **Section 17.2**. Requirements for construction and operational monitoring are provided in **Section 17.6**.
	6. The assessment must include details of proposed surface and groundwater monitoring.	**Chapter 16** (Geology, soils and groundwater) outlines requirements for baseline groundwater monitoring in **Section 16.6** and **Section 16.7**. **Chapter 17** (Hydrodynamics and water quality) describes surface water monitoring carried out to inform this environmental impact statement in **Section 17.2**. Requirements for construction and operational monitoring are provided in **Section 17.6**.
	7. The Proponent must identify design approaches to minimise or prevent drainage of alluvium in the paleochannels.	**Chapter 16** (Geology, soils and groundwater), **Section 16.3.4** describes paleochannels near the project. **Chapter 5** (Project description) and **Chapter 6** (Construction work) provide details of tunnel design.
10. Water – Quality The project is designed, constructed and operated to protect the NSW Water Quality Objectives where they are currently being achieved, and contribute towards achievement of the Water Quality Objectives over time where they are currently not being achieved, including downstream of the project to the extent of the project	1. The Proponent must: a. describe the background conditions for any surface or groundwater resource likely to be affected by the development	**Chapter 16** (Geology, soils and groundwater), **Section 16.3** provides a description of the background groundwater conditions. **Chapter 17** (Hydrodynamics and water quality), **Section 17.3** provides a description of the background surface water conditions.
	b. state the ambient NSW Water Quality Objectives (NSW WQO) (as endorsed by the NSW Government [see www.environment.nsw.gov.au/ieo/index.htm]) and environmental values for the receiving waters (including groundwater where appropriate) relevant to the project, including the indicators and associated trigger values or criteria for the identified environmental	**Chapter 17** (Hydrodynamics and water quality), **Section 17.1.2** includes a list of the ambient NSW Water Quality Objectives (NSW WQO) for receiving waters within the project area. Environmental values for the receiving waters are discussed in **Section 17.3.8**. The ANZG (2018) and ANZECC/ARMCANZ (2000) default trigger values are provided in **Appendix O** (Technical working paper: Surface

Desired performance outcome	SEARs requirements	Where addressed in this EIS
impact including estuarine and marine waters (if applicable).	values in accordance with the ANZECC (2000) Guidelines for Fresh and Marine Water Quality and/or local objectives, criteria or targets endorsed by the NSW Government;	water quality and hydrology) and **Appendix Q** (Technical working paper: Marine water quality).
	c. identify and estimate the quality and quantity of all pollutants that may be introduced into the water cycle by source and discharge point and describe the nature and degree of impact that any discharge(s) may have on the receiving environment, including consideration of all pollutants that pose a risk of non-trivial harm to human health and the environment;	**Chapter 17** (Hydrodynamics and water quality) identifies pollutants of concern in **Section 17.4** and **Section 17.5.** Pollutants are also discussed in **Appendix O** (Technical working paper: Surface water quality and hydrology). An assessment of the potential for construction to introduce pollutants into receiving waterways is provided in **Section 17.4**. Discharge quantities and locations are provided in **Section 17.4.3**, **Section 17.4.4** and **Section 17.5.3**.
	d. identify the rainfall event that the water quality protection measures will be designed to cope with;	**Appendix O** (Technical working paper: Surface water quality and hydrology) outlines water quality protection measures proposed for adoption during construction and operation and what event basins would be designed for.
	e. assess the significance of any identified impacts including consideration of the relevant ambient water quality outcomes;	**Chapter 17** (Hydrodynamics and water quality), **Section 17.4** and **Section 17.5** assess the significance of identified impacts on ambient water quality outcomes.
	f. demonstrate how construction and operation of the project (including mitigating effects of proposed stormwater and wastewater management) will, to the extent that the project can influence, ensure that: - where the NSW WQOs for receiving waters are currently being met they will continue to be protected; and - where the NSW WQOs are not currently being met, activities will work toward their achievement over time;	**Chapter 17** (Hydrodynamics and water quality), **Section 17.4.3** and **Section 17.5.3** include a discussion of whether the NSW WQOs are protected (if currently met) or achieved (if not currently met). Management measures relevant to surface water quality impacts are provided in **Section 17.6**.

Desired performance outcome	SEARs requirements	Where addressed in this EIS
	g. justify, if required, why the WQOs cannot be maintained or achieved over time;	**Chapter 17** (Hydrodynamics and water quality), **Section 17.4** and **Section 17.5** discuss the ability of the project to meet the NSW WQOs.
	h. demonstrate that all practical measures to avoid or minimise water pollution and protect human health and the environment from harm are investigated and implemented	The project has been designed to avoid or minimise environmental impacts. Relevant environmental controls are detailed in **Chapter 5** (Project description) and **Chapter 6** (Construction work). **Chapter 17** (Hydrodynamics and water quality), **Section 17.6** provides practical management measures to be adopted for the project. **Chapter 13** (Human health), **Section 13.4** and **Section 13.5** consider health related risks. Management measures to ensure the protection of human health are outlined in **Section 13.6**.
	i. identify sensitive receiving environments (which may include estuarine and marine waters downstream including Burnt Bridge Creek, Quarry Creek and Flat Rock Creek) and develop a strategy to avoid or minimise impacts on these environments; and	**Chapter 17** (Hydrodynamics and water quality), **Section 17.3.7** identifies and describes sensitive receiving environments. Management measures to avoid (or minimise) impacts are provided in **Section 17.6**. Further details, including water quality monitoring frequency and indicators are provided in **Appendix O** (Technical working paper: Surface water quality and hydrology). The project has been designed to avoid or minimise environmental impacts. Relevant environmental controls are detailed in **Chapter 5** (Project description) and **Chapter 6** (Construction work).
	j. identify proposed monitoring locations, monitoring frequency and indicators of surface and groundwater quality.	**Chapter 16** (Geology, soils and water quality), **Section 16.7** identifies the proposed monitoring locations, frequency and indicators for groundwater quality. **Chapter 17** (Hydrodynamics and water quality), **Section 17.6** identifies the proposed surface water monitoring locations, frequency and indicators for surface water quality.

Desired performance outcome	SEARs requirements	Where addressed in this EIS
	k. identify how the development meets the objectives of the *Coastal Management Act 2016* and management objectives of relevant Coastal Management Areas defined under the *Coastal Management Act 2016*.	**Chapter 17** (Hydrodynamics and water quality), **Section 17.1.1** outlines consistency with the objectives and management objectives of the *Coastal Management Act 2016.*
	l. demonstrate consistency with any relevant certified Coastal Management Program (or Coastal Zone Management Plan).	**Chapter 17** (Hydrodynamics and water quality), **Section 17.1.2** outlines consistency with the vision and objectives presented in the Greater Sydney Harbour Estuary Coastal Management Program Scoping Study.
	2. The assessment should consider the results of any current water quality studies, as available, in the project catchment.	Surface water quality studies considered for this assessment are listed in **Appendix O** (Technical working paper: Surface water quality and hydrology).
11. Flooding The project minimises adverse impacts on existing flooding characteristics. Construction and operation of the project avoids or minimises the risk of, and adverse impacts from, infrastructure flooding, flooding hazards, or dam failure.	1. The EIS must map the following features relevant to flooding as described in the *NSW Floodplain Development Manual 2005* (NSW Government, 2005) including: a. Flood prone land; b. Flood planning areas, the area below the flood planning level; c. Hydraulic categorisation (floodways and flood storage areas); and d. Flood Hazard	**Chapter 18** (Flooding), **Appendix R** (Technical working paper: Flooding) provides figures containing maps of features relevant to flooding addressing requirements a to d.

Desired performance outcome	SEARs requirements	Where addressed in this EIS
	2. The Proponent must assess and (model where required) the impacts on flood behaviour during construction and operation for a full range of flood events up to the probable maximum flood (taking into account sea level rise and storm intensity due to climate change) including: a. how the tunnel entries and cut-and-cover sections of the tunnels would be protected from flooding during construction works;	**Chapter 18** (Flooding), **Section 18.3** sets out the approach that was adopted to assess the impact the project would have on flood behaviour during its construction and operation. **Section 18.5** and **Section 18.6** detail the findings of the impact assessment during construction and operation respectively thereafter. **Section 18.5.2** summarises the findings of the assessed flood risk at the temporary construction support sites that would be used to support tunnel excavation and the construction of cut and cover sections of tunnel, while **Section 18.8** contains a set of measures which are aimed at managing the flood risk during tunnel construction.
	b. any detrimental increases in the potential flood affectation of the project infrastructure and other properties, assets and infrastructure;	**Chapter 18** (Flooding), **Section 18.5** and **Section 18.6** present the findings of an assessment of the potential impacts on flood behaviour during the construction and operational phases of the project, respectively.
	c. consistency (or inconsistency) with applicable Council floodplain risk management plans;	**Chapter 18** (Flooding), **Section 18.6.3** presents the findings of a review of the project in terms of its consistency with Council floodplain risk management plans.
	d. compatibility with the flood hazard of the land;	**Chapter 18** (Flooding), **Section 18.4** describes the existing flood behaviour in the vicinity of the project, including an overview of the provisional flood hazard for a 1% AEP flood. **Section 18.5.2** includes discussion on the potential flood hazard at proposed temporary construction support sites, while **Section 18.6** includes discussion on the findings of the assessment in terms of the impact that the operation of the project would have on the hazard categorisation of the floodplain.
	e. compatibility with the hydraulic functions of flow conveyance in flood ways and storage areas of the land;	**Chapter 18** (Flooding), **Section 18.4** describes the existing flood behaviour in the vicinity of the project, including the hydraulic categorisation of the floodplain into floodways, flood storage and flood fringe for a 1% AEP flood. **Section 18.5** and **Section 18.6** describe the impacts on flood behaviour as a result of changes to flow conveyance and flood storage across the floodplain.

Desired performance outcome	SEARs requirements	Where addressed in this EIS
	f. whether there will be adverse effect to beneficial inundation of the floodplain environment, on, or adjacent to or downstream of the site;	**Chapter 18** (Flooding) identifies that, due to the urbanised nature of the floodplain, no areas have been identified where there would be an adverse effect caused by a reduction in inundation. **Section 18.5** and **Section 18.6** present the findings of an assessment of more general impacts of the project on flood behaviour, including changes in the extent of inundation.
	g. downstream velocity and scour potential;	**Chapter 18** (Flooding), **Section 18.5** identifies potential impacts that the construction of the project could have on velocity and scour potential, while **Section 18.6** present the findings of an assessment of the corresponding impacts during the operation of the project. **Chapter 17** (Hydrodynamics and water quality), **Section 17.5.5** discusses impacts from scour and erosion on geomorphology.
	h. impacts the development may have upon existing community emergency management arrangements for flooding. These matters must be discussed with the State Emergency Services and Council;	**Chapter 18** (Flooding), **Section 18.6** provides an assessment of the impact of the project on transport infrastructure that may be relied upon as part of community emergency management arrangements. **Section 18.8** includes a recommendation for the incorporation of flood emergency management measures into the relevant environmental and/or safety management documentation for the project.
	i. any impacts the development may have on the social and economic costs to the community as consequence of flooding;	**Chapter 18** (Flooding), **Section 18.5** and **Section 18.6** present the findings of an assessment of the potential impacts on flood behaviour during the construction and operational phases of the project respectively, including consideration of social, community and economic impacts.
	j. whether there will be direct or indirect increase in erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses; and	**Chapter 18** (Flooding), **Section 18.5** identifies potential impacts that the construction of the project could have on erosion, siltation and the stability of watercourses, while **Section 18.6** present the findings of an assessment of the corresponding impacts during the operation of the project.

Desired performance outcome	SEARs requirements	Where addressed in this EIS
		Chapter 17 (Hydrodynamics and water quality), **Section 17.5.5** discusses impacts from scour and erosion on geomorphology.
	k. any mitigation measures required to offset potential flood risks attributable to the project (these mitigation measures must be discussed with the State Emergency Services and Council where appropriate).	**Chapter 18** (Flooding), **Section 18.8** outlines potential measures to mitigate construction and operational related impacts of the project on flooding conditions (and therefore the potential for increased flood risk) in adjacent development and to manage the risk of flooding to the project.
	3. The assessment should take into consideration any flood studies undertaken by local government councils, as available.	**Chapter 18** (Flooding), **Section 18.3** and **Appendix R** (Technical working paper: Flooding) contain details of previous flood studies that were considered as part of the present investigation.
	4. The EIS must assess and model the effect of the proposed development (including fill) on current flood behaviour for the 1 in 200 and 1 in 500 year flood events as proxies for assessing sensitivity to an increase in rainfall intensity of flood producing rainfall events due to climate change.	**Chapter 18** (Flooding), **Section 18.6.4** provides an assessment of the impact the project would have on flood behaviour under future climate change conditions.
12. Spoil The Proponent must ensure that spoil generated during the construction is effectively stored, handled, treated (if necessary), reused, and/or disposed of lawfully and in a manner that protects environmental values.	1. The Proponent must identify and assess spoil generation and reuse, including: a. type and quantity;	**Chapter 24** (Resource use and waste management), **Section 24.3.3** outlines spoil balance and management including estimates of the type and quantities of spoil.
	b. onsite storage (including capacity to minimise amenity impacts);	**Chapter 24** (Resource use and waste management), **Section 24.3.3** identifies indicative stockpile locations, volumes and descriptions of onsite storage.
	c. reuse potential and disposal sites;	**Chapter 24** (Resource use and waste management), **Section 24.3.3** discusses the reuse of construction spoil. Waste disposal locations are discussed in **Section 24.5**.

Desired performance outcome	SEARs requirements	Where addressed in this EIS
	d. transport and handling options (including traffic, distance, road safety and related amenity and environmental impacts); and	**Chapter 4** (Project development and alternatives), **Section 4.5.8** outlines spoil transport alternatives that were considered for the project.
	e. illegal dumping.	**Chapter 24** (Resource use and waste management), **Section 24.3** considers the potential risk of illegal dumping of spoil. **Section 24.6** outlines the management of waste disposal.

Desired performance outcome	SEARs requirements	Where addressed in this EIS
13. Soils and Contamination The environmental values of land, including soils, subsoils and landforms, are protected. Risks arising from the disturbance and excavation of land and disposal of soil are minimised, including disturbance to acid sulfate soils and site contamination.	1. The Proponent must verify the risk of acid sulfate soils (Class 1, 2, 3 or 4 on the Acid Sulfate Soil Risk Map) within, and in the area likely to be impacted by, the project.	Details with respect to the risk of acid sulfate soils are presented within **Chapter 16** (Geology, soils and groundwater), **Section 16.3.3**, **Appendix M** (Technical working paper: Contamination), **Appendix N** (Technical working paper: Groundwater) and **Appendix O** (Technical working paper: Surface water quality and hydrology).
	2. The Proponent must assess the impact of the project on acid sulfate soils (including impacts of acidic runoff offsite) in accordance with the current guidelines and detail the mitigation measures proposed to minimise potential impacts.	**Chapter 16** (Geology, soils and groundwater), **Section 16.4.1** provides an assessment of the impact of the project on acid sulfate soils. Mitigation measures to minimise these impacts are outlined in **Section 16.7**. More specific details with respect to contamination are provided in **Appendix M** (Technical working paper: Contamination), groundwater in **Appendix N** (Technical working paper: Groundwater) and surface water within **Appendix O** (Technical working paper: Surface water quality and hydrology).
	3. The Proponent must assess whether the land and harbour sediment is likely to be contaminated and identify if remediation is required, having regard to the ecological and human health risks posed by the contamination in the context of past, existing and future land uses.	**Chapter 16** (Geology, soils and groundwater), **Section 16.4** provides a qualitative assessment of the potential contamination risks and the need for remediation. Requirements for future remediation activities are identified **Section 16.7**. **Chapter 13** (Human health), **Section 13.4** discusses human health risks and impacts due to potential contaminated soil/groundwater exposure. Further details are presented in **Appendix I** (Technical working paper: Health impact assessment). Ecological risks posed by contamination are considered within **Chapter 19** (Biodiversity) and presented in more detail in **Appendix M** (Technical working paper: Contamination), **Appendix Q** (Technical working paper: Marine water quality), **Appendix S** (Technical working paper: Biodiversity development assessment report) and **Appendix T** (Technical working paper: Marine ecology).

Desired performance outcome	SEARs requirements	Where addressed in this EIS
	4. Where assessment and/or remediation is required, the Proponent must document how the assessment and/or remediation would be undertaken in accordance with current guidelines.	**Chapter 16** (Geology, soils and groundwater), **Section 16.7** outlines the process for further assessment and remediation should it be required.
	5. Where contaminated spoil and/or sediments are to be handled, the Proponent must provide details of contamination characteristics and measures to manage this spoil to avoid adverse impacts to land and water quality;	**Chapter 6** (Construction work) details the proposed construction method which has considered measures from **Appendix Q** (Technical working paper: Marine water quality) to avoid adverse impacts to land and water quality during spoil handling. **Appendix P** (Technical working paper: Hydrodynamics and dredge plume modelling) outlines the proposed dredge methodology. **Chapter 16** (Geology, soils and groundwater), **Section 16.3.5** and **Section 16.4.3** provide the contamination characteristics of the spoil likely to be handled. **Section 16.7** provides the environmental management measures proposed to manage the spoil to avoid adverse impacts to land and water quality. Further detail is provided in **Appendix M** (Technical working paper: Contamination).
	6. The Proponent must assess whether salinity is likely to be an issue and if so, determine the presence, extent and severity of soil salinity within the project area.	**Chapter 16** (Geology, soils and groundwater), **Section 16.3.3** provides an assessment of the potential for salinity to be present including its severity.
	7. The Proponent must assess the impacts of the project on soil salinity and how it may affect groundwater resources and hydrology.	**Chapter 16** (Geology, soils and groundwater), **Section 16.3.3** and **Section 16.4.1** provide an assessment of the project's impact on soil salinity and how it may affect groundwater resources and hydrology.
	8. The Proponent must assess the impacts on soil and land resources (including erosion risk or hazard). Particular attention must be given to soil erosion and sediment	**Chapter 16** (Geology, soils and groundwater), **Section 16.3.3** and **Section 16.4.1** provide an assessment of the project's impact on soil and land resources, with particular emphasis on soil erosion and sediment transport.

Desired performance outcome	SEARs requirements	Where addressed in this EIS
	transport consistent with the practices and principles in the current guidelines.	
	9. The Proponent must assess the impact of any disturbance of contaminated groundwater and the tunnels should be designed so as to not exacerbate mobilisation of contaminated groundwater and/or prevent contaminated groundwater flow.	**Chapter 16** (Geology, soils and groundwater), **Section 16.4** and **Chapter 5** (Project description) provide an assessment of contaminated groundwater impacts and a description of how the tunnel has been designed so as to not exacerbate mobilisation of contaminated groundwater and/or prevent contaminated groundwater flow.
14. Heritage The design, construction and operation of the project facilitates, to the greatest extent possible, the long term protection, conservation and management of the heritage significance of items of environmental heritage and Aboriginal objects and places. The design, construction and operation of the project avoids or minimises impacts, to the greatest extent possible, on the heritage significance of environmental heritage and Aboriginal objects and places.	1. The Proponent must identify and assess any direct and/or indirect impacts (including cumulative, vibration and visual impacts) to the heritage significance of listed (and nominated) heritage items inclusive of:	
	a. Aboriginal places and objects, as defined under the *National Parks and Wildlife Act 1974* and in accordance with the principles and methods of assessment identified in the current guidelines;	**Chapter 15** (Aboriginal cultural heritage), **Section 15.4** identifies and assesses all Aboriginal places and objects. The legislative and policy framework used for the assessment is outlined in **Section 15.1**, which includes reference to the guidelines used to consider potential impacts.
	b. Aboriginal places of heritage significance, as defined in the Standard Instrument – Principal Local Environmental Plan;	**Chapter 15** (Aboriginal cultural heritage), **Section 15.3.3** identifies Aboriginal places of heritage significance as defined in the Standard Instrument – Principal Local Environmental Plan.
	c. environmental heritage, as defined under the *Heritage Act 1977* (including potential items of heritage value, conservation areas, open space heritage landscapes, built heritage landscapes and archaeology);	**Chapter 14** (Non-Aboriginal heritage), **Section 14.3** presents a summary of listed heritage items and conservation areas within the study area. **Section 14.4** assesses the direct and/or indirect impacts (including potential items of heritage value, conservation

Desired performance outcome	SEARs requirements	Where addressed in this EIS
		areas, open space heritage landscapes, built heritage landscapes and archaeology) to the heritage significance of listed (and nominated) heritage items.
	d. items listed on the State, National and World Heritage lists;	**Chapter 14** (Non-Aboriginal heritage), **Section 14.4.2** assesses the direct and/or indirect impacts (including potential items of heritage value, conservation areas, open space heritage landscapes, built heritage landscapes and archaeology) to the heritage significance of listed (and nominated) heritage items.
	e. heritage items and conservation areas identified in local and regional planning environmental instruments covering the project area; and	**Chapter 14** (Non-Aboriginal heritage), **Section 14.4.2** assesses the direct and/or indirect impacts (including potential items of heritage value, conservation areas, open space heritage landscapes, built heritage landscapes and archaeology) to the heritage significance of listed (and nominated) heritage items.
	f. marine items of potential heritage significance within Middle Harbour, such as any shipwrecks.	**Chapter 14** (Non-Aboriginal heritage)**, Section 14.4.3** includes assessment of maritime items of potential heritage significance within Middle Harbour. Further details are provided in **Appendix K** (Technical working paper: Maritime heritage).
	2. Where impacts to State or locally significant heritage items or archaeology are identified, the assessment must: a. include a significance assessment and statement of heritage impact for all heritage items (including any unlisted places that are assessed of heritage value;	Significance assessments and statements of heritage impact are presented in **Chapter 14** (Non-Aboriginal heritage), **Section 14.4**, **Appendix J** (Technical working paper: Non-Aboriginal heritage), **Chapter 15** (Aboriginal cultural heritage), **Section 15.3.7** and **Appendix L** (Technical working paper: Aboriginal cultural heritage assessment report).
	b. provide a discussion of alternative locations and design options that have been considered to reduce heritage impacts;	**Chapter 14** (Non-Aboriginal heritage), **Section 14.4.1** and **Appendix J** (Technical working paper: Non-Aboriginal heritage) provide a discussion of alternative locations and design options with respect to non-Aboriginal heritage. **Appendix L** (Technical working paper: Aboriginal cultural heritage assessment report) provides a discussion of alternative locations and design options with respect to Aboriginal cultural heritage items.

Desired performance outcome	SEARs requirements	Where addressed in this EIS
		Chapter 4 (Project development and alternatives), **Section 4.4** and **Section 4.5** detail alternative locations and design options which were considered with respect to environmental considerations.
	c. in areas identified as having potential archaeological significance, undertake a comprehensive archaeological assessment and management plan in line with Heritage Council guidelines which includes a methodology and research design to assess the impact of the works on the potential archaeological resource and to guide physical archaeological test excavations and include the results of these excavations. This is to be carried out by a suitably qualified archaeologist and is to discuss the likelihood of significant historical, maritime and Aboriginal archaeology on the site, how this may be impacted by the project, and includes measures to mitigate any impacts;	**Chapter 15** (Aboriginal cultural heritage), **Section 15.3** provides details of test excavations carried out. Further details are provided in Annexure E of **Appendix L** (Technical working paper: Aboriginal cultural heritage assessment report).
	d. consider impacts to the item of significance caused by, but not limited to, vibration, demolition, archaeological disturbance, altered historical arrangements and access, increased traffic, visual amenity, landscape and vistas, curtilage, subsidence and architectural noise treatment (as relevant);	**Chapter 14** (Non-Aboriginal heritage), **Section 14.4** and **Appendix J** (Technical working paper: Non-Aboriginal heritage) discuss the impacts as a result of vibration, demolition, archaeological disturbance, altered historical arrangements and access, increased traffic, visual amenity, landscape and vistas, curtilage, subsidence and architectural noise treatment (as relevant). **Chapter 15** (Aboriginal cultural heritage), **Section 15.4** and **Appendix L** (Technical working paper: Aboriginal cultural heritage assessment report) discuss the impacts as a result of vibration, demolition, archaeological disturbance, altered historical arrangements and access, increased traffic, visual amenity, landscape and vistas, curtilage, subsidence and architectural noise treatment (as relevant).
	e. provide a comparative analysis to inform the rarity and representative value of any heritage places proposed for demolition;	A comparative analysis is not required for the reasons stated in **Appendix J** (Technical working paper: Non-Aboriginal

Desired performance outcome	SEARs requirements	Where addressed in this EIS
		heritage). This is summarised in **Section 14.4.1** of **Chapter 14** (Non-Aboriginal heritage).
	f. outline mitigation measures to avoid and minimise impacts identified in accordance with the current guidelines; and	**Chapter 14** (Non-Aboriginal heritage), **Section 14.5** presents the environmental management measures regarding non-Aboriginal heritage items. **Chapter 15** (Aboriginal cultural heritage), **Section 15.5** presents environmental management measures for Aboriginal heritage items.
	g. be undertaken by a suitably qualified heritage consultant(s) (note: where archaeological excavations are proposed the relevant consultant must meet the NSW Heritage Council's Excavation Director criteria).	**Appendix J** (Technical working paper: Non-Aboriginal heritage) provides details of qualifications held by the heritage consultants who carried out the non-Aboriginal heritage assessment. **Appendix L** (Technical working paper: Aboriginal cultural heritage assessment report) provides details of qualifications held by the archaeologists who carried out the Aboriginal cultural heritage assessment.
	3. Where archaeological investigations of Aboriginal objects are proposed these must be conducted by a suitably qualified archaeologist, meeting the minimum qualification requirements specified in section 1.6 of the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010).	**Appendix L** (Technical working paper: Aboriginal cultural heritage assessment report) provides details of qualifications held by the archaeologists who carried out the Aboriginal cultural heritage assessment.
	4. The Proponent must identify and describe the Aboriginal cultural heritage values that exist across the whole area that would be affected by the development and document these in an Aboriginal Cultural Heritage Assessment Report (ACHAR). This may include the need for surface survey and test excavation. The identification of cultural heritage values must be conducted in accordance with *Code of Practice for Archaeological Investigations of Aboriginal Objects in NSW* (OEH 2010), and guided by the *Guide to*	**Chapter 15** (Aboriginal cultural heritage), **Section 15.3** and **Appendix L** (Technical working paper: Aboriginal cultural heritage assessment report) document Aboriginal cultural heritage values

Desired performance outcome	SEARs requirements	Where addressed in this EIS
	investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW (DECCW, 2011).	
	5. Consultation with Aboriginal people must be undertaken and documented in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW). The significance of cultural heritage values for Aboriginal people who have a cultural association with the land must be documented in the ACHAR.	**Chapter 7** (Stakeholder and community engagement) discusses the Aboriginal stakeholder consultation that was carried out in accordance with the Procedure for Aboriginal Cultural Heritage Consultation and Investigation (PACHCI) (Roads and Maritime, 2011). **Chapter 15** (Aboriginal cultural heritage), **Section 15.3.7** summarises how Aboriginal cultural significance was assessed through consultation.
	6. Impacts on Aboriginal cultural heritage values are to be assessed and documented in the ACHAR. The ACHAR must demonstrate attempts to avoid impact upon cultural heritage values and identify any conservation outcomes. Where impacts are unavoidable, the ACHAR must outline measures proposed to mitigate impacts. Any objects recorded as part of the assessment must be documented and notified to the Environment, Energy and Science Group in the Department of Planning, Industry and Environment. Note that due diligence is not an appropriate assessment, and an ACHAR is required.	**Chapter 15** (Aboriginal cultural heritage), **Section 15.4** and **Appendix L** (Technical working paper: Aboriginal cultural heritage assessment report) document potential impacts and management recommendations.
15. Sustainability The project reduces the NSW Government's operating costs and ensures the effective and efficient use of resources. Conservation of natural resources is maximised.	1. The Proponent must assess the sustainability of the project in accordance with the Infrastructure Sustainability Council of Australia (ISCA) *Infrastructure Sustainability Rating Tool* and recommend an appropriate target rating for the project.	**Chapter 25** (Sustainability), **Section 25.2** provides an assessment of the sustainability of the project in accordance with the ISCA Infrastructure Sustainability Rating Tool. The Sustainability Management Plan will detail measures to meet the sustainability objectives and targets.
	2. The Proponent must assess the project against the current guidelines including targets and strategies to improve Government efficiency in use of water, energy and transport.	**Chapter 25** (Sustainability), **Section 25.2.1** provides a discussion of the sustainability framework and its relevance to legislation, policies and guidelines. The sustainable use of water and energy resources is discussed in **Chapter 24** (Resource use and waste management).

Desired performance outcome	SEARs requirements	Where addressed in this EIS
16. Waste All wastes generated during the construction and operation of the project are effectively stored, handled, treated, reused, recycled and/or disposed of lawfully and in a manner that protects environmental values.	1. The Proponent must assess predicted waste generated from the project during construction and operation, including: a. classification of the waste in accordance with the current guidelines;	**Chapter 24** (Resource use and waste management), **Section 24.3.2** and **Section 24.4.2** classify the waste streams associated with the project.
	b. estimates / details of the quantity of each classification of waste to be generated during the construction of the project, including bulk earthworks and spoil balance;	**Chapter 24** (Resource use and waste management), **Section 24.3.2** and **Section 24.4.2** provide estimates of the quantities of waste generated by the project. Spoil balance and management is outlined in **Section 24.3.3**.
	c. handling of waste including measures to facilitate segregation and prevent cross contamination;	**Chapter 24** (Resource use and waste management), **Section 24.6** provides construction waste management measures.
	d. management of waste including estimated location and volume of stockpiles;	**Chapter 24** (Resource use and waste management), **Section 24.3** provides indicative stockpile locations and volumes.
	e. waste minimisation and reuse;	**Chapter 24** (Resource use and waste management) discusses the reuse of construction and operational waste in **Section 24.3.2** and **Section 24.4.2** respectively.
	f. lawful disposal or recycling locations for each type of waste; and	**Chapter 24** (Resource use and waste management), **Section 24.3.2** and **Section 24.5** outline disposal and recycling options
	g. contingencies for the above, including managing unexpected waste volumes.	**Chapter 24** (Resource use and waste management), **Section 24.6** discusses contingencies for managing unexpected waste.
	2. The Proponent must assess potential environmental impacts from the excavation, handling, storage on site and transport of the waste particularly with relation to sediment/leachate control, noise and dust.	**Chapter 24** (Resource use and waste management), **Section 24.3.1** and **Section 24.4.1** discuss potential environmental impacts associated with the handling, storage and transport of waste. Dust impacts and management are discussed in **Chapter 12** (Air quality).

Desired performance outcome	SEARs requirements	Where addressed in this EIS
		Noise impacts and management are discussed in **Chapter 10** (Construction noise and vibration). Sediment control and potential environmental impacts associated with the excavation of waste are described in **Chapter 16** (Geology, soils and groundwater) and **Chapter 17** (Hydrodynamics and water quality).
17. Climate Change Risk The project is designed, constructed and operated to be resilient to the future impacts of climate change.	1. The Proponent must assess the risk and vulnerability of the project to climate change in accordance with the current guidelines.	**Chapter 26** (Climate change risk and greenhouse gas) and **Appendix X** (Climate change and greenhouse gas calculations), present a climate change risk assessment for the project in accordance with current guidelines as listed in **Section 26.1.1**.
	2. The Proponent must quantify specific climate change risks with reference to either the NSW Government's climate projections at 10 km resolution (or lesser resolution if 10 km projections are not available) or equivalent projection tool (such as the Climate Futures Tool from CSIRO and BoM (attenuated for project region)) and incorporate specific adaptation actions in the design.	**Chapter 26** (Climate change risk and greenhouse gas), **Section 26.1** and **Appendix X** (Climate change and greenhouse gas calculations) quantify the climate change risks to the project. Current climate change projections are presented in **Section 26.1.3**.
18. Hazards	1. The Proponent must describe the process for assessing the risk of emissions from ventilation facilities on aircraft operations taking into consideration the requirements of the *Airports Act 1996* (Commonwealth) and the *Airport Regulations 1997*.	**Chapter 2** (Assessment process), **Section 2.2** summarises the process for the assessment of risk of emissions from ventilation outlets on aircraft operation. **Chapter 23** (Hazards and risks), **Section 23.3.6** presents the findings of this assessment.