ATTACHMENT 2

Cross Reference to
Assessment Requirements

Table A2-1
Reconciliation Table for the SEARs

Assessment Requirement	EIS Reference
General Requirements	
The Environmental Impact Statement (EIS) must meet the minimum form and content requirements as prescribed by Schedule 2 of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation) and must have regard to the *State Significant Infrastructure Guidelines*. Note: The *Environmental Planning and Assessment Regulation 2000* was replaced by the *Environmental Planning and Assessment Regulation 2021*, which replicates the requirements of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000* in Division 8 of Part 5 of *Environmental Planning and Assessment Regulation 2021*.	EIS (general structure and content)
In particular, the EIS must include: • a stand-alone executive summary;	Executive Summary
• a full description of the development, including: - historical mining operations at the mine and in the surrounding region;	Section 3
- details of the resource to be extracted and justification for the proposed mine design, having regard to the advice of Regional NSW – Mining, Exploration and Geosciences (see Attachment 2);	Section 4
- the mine layout and likely staging or sequencing of the development, including construction, exploration, operation and rehabilitation;	Section 4
- coal production rates (ROM and product) and a life of mine production schedule;	Section 4.5
- forecast production tonnages split into market segment, including export/domestic and thermal/metallurgical coal markets;	Section 4[1]
- coal processing and transportation arrangements;	Sections 4.6 and 4.7
- surface infrastructure and facilities;	Section 4.10
- workforce requirements during all phases of the development (on a full-time equivalent basis);	Section 4.14
- a waste management strategy;	Section 4.11
- a water management strategy;	Section 4.9
- a rehabilitation strategy;	Section 4.13 and Attachment 9
- the likely interactions between the development and any other historical, existing, approved or proposed mining or infrastructure projects in the vicinity of the site;	Sections 1.1, 1.2 and 4.15
• strategic context for the development in regard to supply of coal for steelmaking or other purposes;	Section 2
• the statutory context for the development including any approvals that must be obtained before the development may commence;	Section 5
• consideration of alternatives;	Section 2 and Attachment 11
• an assessment of the likely impacts of the development on the environment focusing on the specific issues identified below, including: - a description of the existing environment likely to be affected by the development, using sufficient baseline data;	Section 7 and Appendices A to S
- an assessment of the likely impacts of all stages of the development, including appropriate worst-case scenarios, consideration of any cumulative impacts, taking into consideration any relevant legislation, environmental planning instruments, guidelines, policies, plans and industry codes of practice and with consideration to advice provided by agencies in Attachment 2;	

[1] Forecast production tonnages cannot be accurately split into market segments, as product coal is blended with coal from the Appin Mine to meet customer specifications, and sold as a single IMC product. In addition, this information is considered commercial in confidence (as recognised by the MEG in its advice to the SEARs). IMC can provide this information commercial in confidence to DPIE if requested.

Table A2-1 (Continued)
Reconciliation Table for the SEARs

Assessment Requirement	EIS Reference
- a description of the measures that would be implemented to avoid, mitigate and/or offset the likely impacts of the development, and an assessment of: ○ whether these measures are consistent with industry best practice, and represent the full range of reasonable and feasible mitigation measures that could be implemented;	Section 7, Attachment 10 and Appendices A to S
○ the likely effectiveness of these measures, including performance measures where relevant;	
○ whether contingency plans would be necessary to manage any residual risks; and	
○ a description of the measures that would be implemented to monitor and report on the environmental performance of the development if it is approved;	
• a consolidated summary of all the proposed environmental management and monitoring measures, identifying all the commitments in the EIS;	Attachment 10
• an evaluation of the project as a whole having regard to: - relevant matters for consideration under the *Environmental Planning and Assessment Act 1979*, including the principles of Ecologically Sustainable development and the objects of the Act;	Sections 8.3 and 8.6
- the suitability of the site with respect to potential land use conflicts with existing and future surrounding land uses;	Sections 2.3.4 and 8.2
- the strategic need and justification for the project, including the relative importance of its role in supplying coal to BlueScope Steel, including in the context of medium to long term changes in steel production moving to "green steel" operations;	Section 2, Section 8.2, Attachment 11 and Appendix R
- feasible alternatives to the development (and its key components), including the consequences of not carrying out the development; and	Section 8.2 and Attachment 11
- the biophysical, economic and social costs and benefits of the development;	Section 7, Section 8.5 and Appendices A to S
• a signed statement from the author of the EIS, certifying that the information contained within the document is neither false nor misleading.	EIS Cover Page
Notwithstanding the key issues specified below, the EIS must include an environmental risk assessment to identify the potential environmental impacts associated with the infrastructure.	Appendix M
Where relevant, the assessment of key issues below, and any other significant issues identified in the risk assessment, must include: • adequate baseline data	Section 7 and Appendix A to S
• consideration of the potential cumulative impacts due to other developments in the vicinity (completed, underway or proposed); and	
• measures to avoid, minimise and if necessary, offset predicted impacts, including detailed contingency plans for managing any significant risks to the environment.	Section 7, Attachment 10 Appendix A to S
The EIS must also be accompanied by: • a report from a qualified quantity surveyor providing a detailed calculation of the capital investment value (CIV) (as defined in clause 3 of the Regulation) of the proposal, including details of all assumptions and components from which the CIV calculation is derived. The report shall be prepared on company letterhead and indicate applicable GST component of the CIV and include certification that the information provided is accurate at the date of preparation; and	Attachment 13
• an estimate of jobs that will be created during the construction and operational phases of the proposed infrastructure.	Section 4

Table A2-1 (Continued)
Reconciliation Table for the SEARs

Assessment Requirement	EIS Reference
Key Issues	
The EIS must address the following specific matters: **1. Justification and Alternatives** – including: - detailed consideration of how the issues raised by the Independent Planning Commission of NSW in its determination of the previous Dendrobium Mine Extension Project (SSD-8194), have been taken into account by the development, including consideration of the extent to which the development addresses the issues raised;	Sections 2, 7 and 8 and Attachments 11 and 12
- detailed consideration of how the residual issues raised by key agencies, including WaterNSW, Biodiversity and Conservation Sciences Directorate (BCD) within the Department, the Independent Advisory Panel for Underground Mining (IAPUM) and the Independent Expert Scientific Committee (IESC) regarding the previous Dendrobium Mine Extension Project, have been taken into account by the development;	Attachment 12
- a comprehensive assessment of alternatives, including alternative mine design (including panel dimensions and layout), mining methods (including minimal subsidence options such as bord and pillar/ partial extraction) and coal supply (including supply from other coal operations in the Southern coalfields);	Section 2 and Attachment 11
- the consideration of alternatives must be supported by an assessment comparing the social, economic and environmental impacts of each feasible alternative, a risk evaluation of options and justification for why each alternative has not been adopted; and	Section 2 and Attachment 11
- a strategic justification for the development, demonstrating:	Section 8 and Appendices A to S
○ the need for the development;	Sections 2 and 8
○ how the development has been designed to avoid or minimise, to the greatest extent practicable, impacts on: § significant water resources,	Sections 2, 7.3 and Appendices A, B and C
§ threatened species and biodiversity, and	Sections 2, 7.7 to 7.9, Attachment 11, and Appendices D and E
§ greenhouse gas emissions.	Sections 2, 7.21, Attachment 5 and Appendix R
○ how the development is consistent with the principles of Ecologically Sustainable Development and the objects of the *Environmental Planning and Assessment Act 1979*.	Section 8.6 and Appendices A to S
2. Subsidence – including: - a review of the local and regional geological setting, including identification and characterisation of geological structures and lineaments within the proposed mining area;	Appendix P
- a detailed geotechnical assessment supporting the mine design and mining method, having regard to the advice of Regional NSW – Mining, Exploration and Geoscience (see Attachment 2);	Appendix S
- a detailed review of the status of historical mine workings in the vicinity of the proposed development;	Section 7.3 and Appendix A
- an assessment of the likely conventional and non-conventional subsidence effects and subsidence impacts of the development;	
- a scientifically robust assessment of predicted height of fracturing above longwall panels and the vertical distance separating the fracture zone from the surface cracking zone, including consideration and assessment of alternative mine design options to maximise the vertical distance separating the height of connective fracturing with the surface cracking zone and minimise surface water losses;	Section 8.1.2, Attachment 11, and Appendix B

Table A2-1 (Continued)
Reconciliation Table for the SEARs

Assessment Requirement	EIS Reference
- assessment of the potential consequences of subsidence-related effects and impacts on the natural and built environment, paying particular attention to those features that are considered to have significant ecological, economic, social, cultural or environmental value, taking into consideration connective fracturing above the longwall panels and recorded regional and historical subsidence;	Section 7.3 and Appendix A
- proposed remediation of predicted residual subsidence impacts	Section 7.3, Attachment 9 and Appendix A
- details of the proposed subsidence monitoring network capable of detecting vertical, horizontal and far-field subsidence movements; and	Section 7.3 and Appendix A
- an independent peer review of the subsidence and height of fracturing assessment/s prepared for the development.	Section 7.3 and Attachment 5
3. Water – including: - an assessment of the likely impacts of the development on the quantity and quality of surface and groundwater resources, having regard to the NSW Aquifer Interference Policy and the advice of DPIE Water, WaterNSW and the Environment Protection Authority (EPA) (see Attachment 2). The assessment is to be supported by groundwater modelling and uncertainty analysis generally consistent with the Australian Groundwater Modelling Guidelines;	Sections 7.5 and 7.6, Attachment 8 and Appendices B and C
- an assessment of the likely impacts of the development on aquifers, watercourses, swamps, riparian land, groundwater dependent ecosystems, water supply infrastructure and systems including Cordeaux Dam and Avon Dam, basic landholder rights and other water users. The significance of water-related features must be considered individually for the purpose of impact assessment;	Sections 7.5 and 7.6 and Appendices A, B, C and D
- an assessment of all water take for the life of the project and post-closure, including water taken directly and indirectly and itemised to quantify the contributions from each water source;	Section 7.5, Attachment 8 and Appendix B
- an assessment on whether the development can be operated to achieve a neutral or beneficial effect on water quality in the Sydney Drinking Water Catchment, consistent with the provisions of State Environmental Planning Policy (Sydney Drinking Water Catchment) 2021;	Section 7.6, Attachment 8 and Appendix C
- an assessment of post-mining groundwater recovery and the potential long-term impacts on water quality and quantity of post-closure groundwater discharges, including the proposed method for managing post-closure groundwater discharges. If sealing of mine entries is proposed as a management strategy, the EIS must present:	Section 7.5 and Appendices B and Q
○ evidence to support the feasibility and likely success of this strategy in mitigating ongoing water losses; and	Appendix Q
○ detailed assessment of the long-term effects, impacts and consequences of mine sealing on neighbouring mines, the environment, water quantity and quality in the catchment and public safety;	Appendices B and Q
- a detailed site water balance, including a description of site water demands, water disposal methods (including the location, volume and frequency of any water discharges and management of discharge water quality), water supply and transfer infrastructure and water storage structures, including:	Section 7.5 and Appendix C
○ an assessment of the reliability of water supply, including consideration of climate change; and	Appendix C
○ demonstration that water can be obtained from an appropriately authorised supply in accordance with the operating rules of any relevant Water Sharing Plans (WSP) or any alternative mechanisms agreed following consultation with the relevant NSW government agencies/statutory authorities;	Attachment 8 and Appendices B and C

Table A2-1 (Continued)
Reconciliation Table for the SEARs

Assessment Requirement	EIS Reference
- identification of an adequate and secure water supply for the life of the project and any licensing requirements or other approvals under the Water Act 1912 and/or Water Management Act 2000, including a description of the measures proposed to ensure the development can operate in accordance with the requirements of any relevant water sharing plan or water source embargo, or any alternative mechanisms agreed following consultation with the relevant NSW government agencies/ statutory authorities;	Sections 7.5 and 7.6, Attachment 8 and Appendices B and C
- a detailed description of the proposed water management system (including sewerage), beneficial water re-use program, water monitoring program and other measures to mitigate surface water and groundwater impacts;	Section 4.9 and Appendices B and C
- an assessment of the potential flooding impacts of the development;	Appendix C
- a description of proposed surface and groundwater monitoring activities and methodologies;	Sections 7.5 and 7.6 and Appendices B and C
- an assessment of any potential cumulative impacts on water resources, and any proposed options to manage the cumulative impacts;	
- a description of the reasonable and feasible mitigation and management measures proposed to prevent pollution of waters and to avoid or mitigate impacts to the quality or quantity of surface and groundwater resources, including assessment of the predicted effectiveness and cost of the mitigation measures; and	
- an independent peer review of the groundwater model and the assessment of groundwater impacts prepared for the development.	Section 7.5 and Attachment 5
4. Biodiversity – including: - an assessment of the likely biodiversity impacts of the development in accordance with the Biodiversity Assessment Method (BAM) and documented in a Biodiversity Development Assessment Report (BDAR). The BDAR must have regard to the advice of the BCD (see Attachment 2) and include a strategy to offset any residual impacts of the development, including how required offsets would be achieved;	Appendix D
- the BDAR must demonstrate how impacts to biodiversity values have been avoided and detail measures to mitigate and manage impacts from the development in accordance with the BAM;	Appendix D
- the BDAR must include consideration of the increased risk of bushfire impacts on individual swamps that are predicted to be impacted by the development, and at the landscape scale;	Appendices D and R
- where remediation of impacted swamps and streams is proposed, the BDAR must include evidence to support the likely effectiveness of proposed remediation measures; and	Appendices C and D
- an assessment of the likely impacts of the development on aquatic ecology, including aquatic biodiversity and key fish habitats.	Appendix E
5. Heritage – including: - an assessment of the likely impacts of the development on Aboriginal cultural heritage values having regard to the advice of Heritage NSW (see Attachment 2), including consultation with Aboriginal stakeholders in accordance with Aboriginal Cultural Heritage Consultation Requirements for Proponents (OEH, 2010);	Appendix F
- an assessment of the likely impacts of the development on the historic heritage significance of the site and adjacent areas, including a Statement of Heritage Impact (SOHI) prepared by a suitably qualified heritage consultant in accordance with the guidelines in the NSW Heritage Manual.	Appendix G

Table A2-1 (Continued)
Reconciliation Table for the SEARs

Assessment Requirement	EIS Reference
6. Noise – including: - an assessment of the likely construction, operational and traffic noise impacts of the development, in accordance with the Interim Construction Noise Guideline, NSW Noise Policy for Industry (EPA) and NSW Road Noise Policy, and having regard to the Voluntary Land Acquisition and Mitigation Policy.	Appendix J
7. Air – including: - an assessment of the likely air quality impacts of the development in accordance with the Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW.	Appendix I
8. Greenhouse Gas – including: - an assessment of the likely greenhouse gas emissions of the development;	Appendix I
- analysis of how the development's greenhouse gas emissions would affect State and national greenhouse gas emission reduction targets;	Appendix R
- a review of available best practice greenhouse gas emissions reduction measures available to the development;	Attachment 5 and Appendix R
- details of proposed greenhouse gas emissions avoidance, mitigation and/or offset measures; and	Attachment 10 and Appendix R
9. Land – including: - an assessment of the compatibility of the development with other land uses in the vicinity of the development consistent with the requirements of Clause 12 of State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.	Section 7.4 and Attachments 6 and 7
10. Transport – including: - an assessment of the likely transport impacts of the development on the capacity, condition, safety and efficiency of the surrounding transport network, and any required upgrades or operational measures to minimise transport impacts;	Appendix H
- details of how the development would interact with the Maldon to Dombarton rail corridor and an assessment of the risks to rail assets and the future operational capacity of the corridor from mining operations, undertaken in consultation with the asset owners.	Appendix A
11. Hazards and Bushfire – including: - an assessment of the likely risks to public safety, paying particular attention to potential subsidence risks, bushfire risks, and the handling and use of any dangerous goods;	Appendix N
- an assessment of bushfire risk, including consideration of the impacts of climate change and predicted subsidence-related hydrological changes within the local landscape; and	Appendices D and R
- consideration of State Environmental Planning Policy 33 – Hazardous and Offensive Development with clear justification to support any conclusion that SEPP 33 does not apply. Note: *State Environmental Planning Policy (Resilience and Hazards) 2021* has replaced *State Environmental Planning Policy 33 – Hazardous and Offensive Development*.	Section 7.22 and Appendix N

Table A2-1 (Continued)
Reconciliation Table for the SEARs

Assessment Requirement	EIS Reference
12. Visual – including: - an assessment of the likely visual impacts of the development from key public and private vantage points, and methods to minimise the lighting impacts of the development.	Section 7.18
13. Waste – including: - identification, quantification and classification of the waste streams likely to be generated (including tailings and course rejects) during construction and operation, and describe the measures to be implemented to manage, reuse, recycle and safely dispose of this waste; and	Section 4.11 and Appendix N
- details of proposed methods of storage and management of chemicals, including consideration of any infrastructure required to prevent spills and leaks.	
14. Rehabilitation and Final Landform – including: - a Rehabilitation Strategy addressing:	Attachment 9
○ final land-use options and preferred final land use;	
○ final landform including the conceptual final landform design;	
○ how the rehabilitation of the project will relate to the rehabilitation strategies of neighbouring mines;	Attachment 9
○ management of potential post-mining groundwater discharges; and	Appendix Q
○ inclusion of rehabilitation objectives and completion criteria to achieve the nominated post-mining land use for each mining domain.	Attachment 9
- the Rehabilitation Strategy is to have regard to the advice of the Resources Regulator (see Attachment 2); and	Attachment 9
- identification and discussion of opportunities to improve rehabilitation and environmental outcomes for existing disturbed areas within the project site, and barriers or limitations to effective rehabilitation.	Attachment 9
15. Social - Provide a Social Impact Assessment prepared in accordance with the Social Impact Assessment Guideline.	Appendix K
16. Economic – including: - the likely economic impacts of the development, paying particular attention to:	Appendix L
○ the significance of the resource;	
○ the costs and benefits of the development identifying if it would result in a net benefit to NSW, including consideration of fluctuations in commodity markets and exchange rates, and costs of residual Scope 1 and 2 greenhouse gas emissions appropriately apportioned to NSW; and	
○ the demand for the provision of local infrastructure and services;	
○ the upstream/ downstream inter-relationship of the development for coal supply in the Illawarra region including BlueScope, the Port Kembla coal-loader, and other coal operations in the Southern coalfields; and	Sections 2 and 7.19
- the need for a voluntary planning agreement; in relation to infrastructure, services, and community benefits and to address residual social impacts	

Table A2-1 (Continued)
Reconciliation Table for the SEARs

Assessment Requirement	EIS Reference
Plans and Documents	
The EIS must include all relevant plans, architectural drawings, diagrams and relevant documentation required under Schedule 1 of the Regulation. Provide these as part of the EIS rather than as separate documents. In addition, the EIS must include high quality files of maps and figures of the subject site and proposal.	Throughout EIS
Engagement	
During the preparation of the EIS and subsequent assessment process, you must consult with the Dendrobium Community Consultative Committee (CCC) in accordance with the Community Consultative Committee Guidelines: State Significant Projects.	Section 6.4.2 and Appendix K
You must also consult with the relevant local, State or Commonwealth Government authorities, service providers, community groups including the Aboriginal community and affected landowners.	Sections 6.2, 6.3 and Appendix K
The EIS must detail the engagement undertaken and demonstrate how it was consistent with the Undertaking Engagement Guide: Guidance for State Significant Projects. The EIS must detail how issues raised and feedback provided have been considered and responded to in the project.	
Expiry Date	
If you do not lodge an EIS for the infrastructure within 2 years of the issue date of these SEARs, your SEARs will expire. If an extension to these SEARs will be required, please consult with the Planning Secretary 3 months prior to the expiry date	N/A
References	
The assessment of the key issues listed above must take into account relevant guidelines, policies, and plans as identified. While not exhaustive, Attachment 1 contains a list of some of the guidelines, policies, and plans that may be relevant to the environmental assessment of this proposal.	Throughout EIS

Table A2-2
EPBC Act Assessment Requirements Reference Summary

	Assessment Requirement	EIS Reference
General Requirements		
Relevant Regulations		
5.	The Environmental Impact Statement (EIS) must address the matters outlined in Schedule 4 of the EPBC Regulations and the matters outlined below in relation to the controlling provisions.	EIS (general structure and content)
Project Description		
6.	The title of the action, background to the action and current status.	Sections 1, 2 and 3
7.	The precise location and description of all works to be undertaken (including associated offsite works and infrastructure), structures to be built or elements of the action that may have impacts on Matters of National Environmental Significance (MNES).	Section 4
8.	How the action relates to any other actions that have been, or are being taken in the region affected by the action.	Section 1.2
9.	How the works are to be undertaken and design parameters for those aspects of the structures or elements of the action that may have relevant impacts on MNES.	Sections 4, 7.5, 7.6, 7.7, 7.8 and 7.9
Impacts		
10.	The EIS must include an assessment of the relevant impacts of the action on the matters protected by the controlling provisions, including:	
	i. a description and detailed assessment of the nature and extent of the likely direct, indirect and consequential impacts, including short term and long term relevant impacts;	Sections 7.5, 7.6, 7.7, 7.8, 7.9 and 8 and Appendices B, C, D and E
	ii. a statement whether any relevant impacts are likely to be unknown, unpredictable or irreversible;	Appendices B and C; Appendix 8 of Appendix D; Appendices B, C and D of Appendix E
	iii. analysis of the significance of the relevant impacts; and	Appendices B, C, D and E
	iv. any technical data and other information used or needed to make a detailed assessment of the relevant impacts.	Section 8
Avoidance, mitigation and offsetting		
11.	For <u>each</u> of the relevant matters protected that are likely to be significantly impacted by the action, the EIS must provide information on proposed avoidance and mitigation measures to manage the relevant impacts of the action including:	
	i. a description, and an assessment of the expected or predicted effectiveness of the mitigation measures,	Sections 7.5, 7.6, 7.7, 7.8 and 7.9 and Appendices B, C, D and E
	ii. any statutory policy basis for the mitigation measures;	Sections 7.5, 7.6, 7.7, 7.8 and 7.9 and Appendices B, C, D and E, Sections 5 and 8; Attachment 6
	iii. the cost of the mitigation measures;	Attachment 11 and Appendix L
	iv. an outline of an environmental management plan that sets out the framework for continuing management, mitigation and monitoring programs for the relevant impacts of the action, including any provisions for independent environmental auditing;	Sections 7.5.6, 7.6.6, 7.7.5, 7.8.6 and 7.9.5 and Attachment 10
	v. the name of the agency responsible for endorsing or approving each mitigation measure or monitoring program.	It is understood this would be confirmed in the Infrastructure Approval conditions for the Project should it be approved.
12.	Where a significant residual adverse impact to a relevant protected matter is considered likely, the EIS must provide information on the proposed offset strategy, including discussion of the conservation benefit associated with the proposed offset strategy.	Sections 7.5 and 7.9, Attachment 10 and Appendix D

Table A2-2 (Continued)
EPBC Act Assessment Requirements Reference Summary

	Assessment Requirement	EIS Reference
13.	For each of the relevant matters likely to be impacted by the action the EIS must provide reference to, and consideration of, relevant Commonwealth guidelines and policy statements including any:	Section 7.9 Appendices D and E
	i. conservation advice or recovery plan for the species or community,	Appendices D and E
	ii. relevant threat abatement plan for the species;	Appendices D and E
	iii. wildlife conservation plan for the species; and	Appendices D and E
	iv. any strategic assessment. **Note:** the relevant guidelines and policy statements for each species and community are available from the Department of Agriculture, Water and the Environment Species Profile and Threats Database. http://www.environment.gov.au/cgi-bin/sprat/public/sprat.	Appendices D and E
Key Issues		
14.	Key risks associated with the proposed action from the Commonwealth perspective include:	
	i. Impacts on species and ecological communities:	Appendices D and E
	• Potential impacts arising from clearing approx. 20 hectares (ha) of native vegetation for the construction of infrastructure required for the mining operations. This area comprises of foraging and nesting habitat for threatened species, including the Grey-headed Flying-fox (*Pteropus poliocephalus*) and the Koala (*Phascolarctos cinereus*).	Appendix D
	• Potential impacts on threatened species and ecological communities associated with the underground mining component of the project, including subsidence events which may have implications for species and threatened ecological communities within and surrounding the project site, including the Coastal Upland Swamp within the Sydney Basin Bioregion Endangered Ecological Community, the Littlejohn's Tree Frog (*Litoria littlejohni*) and the Giant Burrowing Frog (*Heleioporus australiacus*).	Appendices D and E
	• The referral does not indicate direct and indirect impacts that may occur to species and ecological communities within the proposed action area and adjacent areas, stating these impacts will be determined as part of the EIS.	Appendices D and E
	ii. Impacts on water resources:	Appendices B and C
	• Potential impacts to groundwater and surface water resources within the project area and surrounds, including:	Appendices B and C
	○ impacts related to subsidence events and their associated impact on water resources within the vicinity of the project site	Appendices A, B and C
	○ changes to surface flow volumes, inflows and flow paths	Appendices B and C
	○ groundwater drawdown and depressurisation of aquifers and shallow and perched groundwater systems within the project area and surrounds	Appendix B
	○ changes to water regimes and adverse impacts on water quality of inflows to water supply storages.	Appendices B and C
	• Potential implications to water resources within the region, noting the action area is within the Metropolitan special area which supplies drinking water to the Macarthur and Illawarra regions.	Appendices B and C
Assessment Requirements		
Biodiversity (Threatened Species and Ecological Communities)		
15.	The EIS must identify each EPBC Act listed threatened species and ecological community likely to be impacted by the action. For any species and communities that are likely to be impacted, the proponent must provide a description of the nature, quantum and consequences of the impacts. For species and communities potentially located in the proposed action area or in the vicinity that are not likely to be impacted, provide evidence why they are not likely to be impacted.	Appendices D and E
16.	For each of the EPBC Act listed species and ecological communities likely to be significantly impacted by the proposed action, the EIS/Biodiversity Development Assessment Report (BDAR) must provide a separate:	Appendices D and E

Table A2-2 (Continued)
EPBC Act Assessment Requirements Reference Summary

	Assessment Requirement	EIS Reference
	i. description of the habitat (including identification and mapping of suitable breeding habitat, suitable foraging habitat, important populations and habitat critical for survival), with consideration of, and reference to, any relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plans;	Appendices D and E
	ii. details of the scope, timing and methodology for studies or surveys used and how they are consistent with (or justification for divergence from) published Australian Government guidelines and policy statements;	Appendices D and E
	iii. description of the relevant impacts of the action having regard to the full national extent of the species or community's range;	Appendices D and E
	iv. description of the specific proposed avoidance and mitigation measures to deal with relevant impacts of the action;	Appendices D and E
	v. identification of significant residual adverse impacts likely to occur after the proposed activities to avoid and mitigate all impacts are taken into account;	Appendices D and E
	vi. description of any offsets proposed to address residual significant impacts and how these offsets will be established.	Appendices D and E
	vii. details of how the current published NSW Biodiversity Assessment Methodology has been applied in accordance with the objects of the EPBC Act to offset significant residual adverse impacts; and	Appendices D and E
	viii. details of the offset package to compensate for significant residual impacts including details of the credit profiles required to offset the action in accordance with the NSW Biodiversity Assessment Methodology and/or mapping and descriptions of the extent and condition of the relevant habitat and/or threatened communities occurring on proposed offset sites.	Appendices D and E
17.	Any significant residual impacts not addressed by the NSW Biodiversity Assessment Methodology may need to be addressed in accordance with the *Environment Protection and Biodiversity Conservation Act 1999* Environmental Offset Policy. http://www.environment.gov.au/epbc/publications/epbc-act-environmental-offsets-policy. **Note:** For the purposes of approval under the EPBC Act, it is a requirement that offsets directly contribute to the ongoing viability of the specific protected matter impacted by a proposed action and deliver an overall conservation outcome that improves or maintains the viability of the MNES i.e. 'like for like'. Like-for-like includes protection of native vegetation that is the same EEC or habitat being impacted, or funding to provide a direct benefit to the matter being impacted i.e. threat abatement, breeding and propagation programs or other relevant conservation measures.	Appendices D and E
Water Resources in Relation to Coal Seam Gas Development and Large Coal Mining Development (section 24D & 24E)		
18.	The EIS must include a detailed water assessment. The water assessment must be undertaken in accordance with the IESC Information Guidelines (https://iesc.environment.gov.au/information-guidelines) and provide the information outlined in these guidelines including:	Appendices B and C
	<u>A description of current regional and proposed impacts to water resources and water-dependent assets.</u>	Appendices B and C
	i. The water assessment should provide a regional overview of the action area including a description of the geological setting, coal resource, surface water catchments, groundwater systems, water-dependent assets, and current and reasonably foreseeable coal mining development and other water-intensive activities.	Appendices B and C
	ii. Provide descriptions of existing conditions, values and sensitivity to potential impacts.	Appendices B and C
	iii. Provide numerical modelling of potential impacts.	Appendices B and C
	iv. Propose mitigation and management measures	Appendices B and C
	<u>Groundwater modelling</u>	
	v. Include a groundwater model that uses a wide variety of parameters and predictions to identify potential changes to:	Appendix B

Table A2-2 (Continued)
EPBC Act Assessment Requirements Reference Summary

	Assessment Requirement	EIS Reference
	• the hydrological regime of the water resource, for example changes to the volume, timing, duration or frequency of ground and surface water flows; or	Appendix B
	• the water quality and quantity of the water resource, for example changes in the level of salinity, pollutants, or nutrients; or water temperature that may adversely impact biodiversity, ecological integrity, social amenity or human health.	Appendix B
	vi. Include a groundwater model that has been integrated with the subsidence model to provide an improved understanding of impacts on surface water and alluvium.	Appendix B
	Analysing potential impacts to groundwater dependant ecosystems (GDEs)	Appendices D and E
	vii. Confirm the distribution of GDEs in the region and the depth to groundwater in areas of potential GDE's.	Appendices D and E
	viii. Conduct a detailed cumulative impact assessment of potential risks to groundwater and surface water ecosystems that may be impacted by the project.	Appendices D and E
	ix. Include an assessment of GDEs.	Appendices D and E
	Surface water modelling x. The EIS should provide surface water modelling which considers water loss from surface waters due to groundwater drawdown, cracking and ponding. The modelling should show the range and likelihood of possible outcomes, based on sensitivity and uncertainty analysis.	Appendices B and C
	xi. Include a surface water assessment.	Appendix C
	Cumulative impact assessment xii. The EIS should include a cumulative impact assessment and consider all relevant past, present and reasonably foreseeable actions, and programs and policies that are likely to impact water resources. Where impacts from a new project are considered small, these need to be considered with the impacts from existing development and the cumulative impact must be assessed to determine if a threshold of acceptable total impact may be crossed.	Appendices B and C
	Comprehensive and detailed monitoring xiii. The EIS should derive site-specific water quality guidelines and provide more information on how the proponent plans to monitor impacts. For example, the parameters and frequency of monitoring should be detailed.	Appendices B and C
Other approvals and conditions		
19.	Information in relation to any other approvals or conditions required must include the information prescribed in Schedule 4 Clause 5 (a) (b) (c) and (d) of the EPBC Regulations.	Section 5
Environmental Record of person proposing to take the action		
20.	Information in relation to the environmental record of a person proposing to take action must include details as prescribed in Schedule 4 Clause 6 of the EPBC Regulations 2000.	Section 5.2.10
Information Sources		
21.	For information given in the EIS, the EIS must state the source of the information, how recent the information is, how the reliability of the information was tested; and what uncertainties (if any) are in the information.	This information has been presented where possible and/or relevant throughout EIS
Anticipated Engagement		
22.	The Applicant should consult with DAWE again after detailed survey work is undertaken and before the EIS is finalised to ensure that all relevant species have been considered and the above assessment requirements have been met.	-
Attachment A		
There are likely to be significant impacts on the following controlling provisions:		
• Listed threatened species and communities (sections 18 and 18A)		Appendices D and E
• A water resource, in relation to coal seam gas development and large coal mining development (section 24D and 24E).		Appendices B and C

Table A2-2 (Continued)
EPBC Act Assessment Requirements Reference Summary

Assessment Requirement	EIS Reference
All matters of national environmental significance (MNES) protected under the triggered controlling provisions are potentially relevant, and it is the responsibility of the proponent to ensure any protected matters under these controlling provisions are assessed for the Commonwealth decision-maker's consideration.	Appendices B, C. D and E
The Department of Agriculture, Water and the Environment considers that there is a likely or potential significant impact on the following protected matters:	Appendices D and E
Listed threatened species and communities (s18 & s18A)	
• Coastal Upland Swamps in the Sydney Basin Bioregion – endangered ecological community: subsidence events associated with the proposed action may reduce the extent of the ecological community and adversely affect critical habitat.	Appendices D and E
• Shale Sandstone Transition Forest of the Sydney Basin Bioregion – critically endangered: longwall mining is listed as a threatening process, disrupting natural groundwater regimes and discharge patterns associated with mining.	
• Grey-headed Flying-fox (*Pteropus poliocephalus*) – vulnerable: there is a nationally important grey headed-flying fox camp located within 20km of the proposed action site.	
• Littlejohn's Tree Frog (*Litoria littlejohni*) – vulnerable: the proposed action may lead to a longterm decrease in the size of the population and reduce the area of occupancy of an important population.	
• Koala (Phascolarctos cinereus) (Combined Population of QLD, NSW and the ACT) – vulnerable: the proposed action could impact important habitat for the species.	
• Greater Glider (*Petauroides volans*) – vulnerable: the proposed action could impact important habitat for the species.	
• Giant Burrowing Frog (*Heleioporus australiacus*) – vulnerable: the proposed action and associated subsidence could significantly impact breeding habitat.	
• Broad-headed Snake (*Hoplocephalus bungaroides*) – vulnerable: the proposed action could impact availability and quality of habitat leading to species decline.	
• Large-eared Pied Bat, Large Pied Bat (*Chalinolobus dwyeri*) – vulnerable: the proposed action could impact current and future habitat for the species, which is considered habitat critical to the survival of the species.	
• Swift Parrot (*Lathamus discolor*) – critically endangered: the proposed action could clear foraging habitat for the species.	
• Silver Perch (*Bidyanus bidyanus*) – critically endangered: subsidence events associated with the proposed action may impact the Cataract Dam, where an important population of the species exists.	
• Rufous Pomaderris, Brown Pomaderris (*Pomaderris brunnea*) – vulnerable: the proposed action may impact the small number of NSW subpopulations that exist, leading to long-term decrease in the species.	
• Woronora Beard-heath (*Leucopogon exolasius*) – vulnerable: approx. 46% of the species distribution occurs within 10km of the proposed action area, therefore potential negative impacts from clearing or subsidence could negatively impact habitat important to the species.	
• Bargo Geebung (*Persoonia bargoensis*) – vulnerable: the proposed action may cause impacts to the species habitat and lead to a long-term decrease in the population size.	
• Small-flower Grevillea (Grevillea parviflora subsp. parviflora) – vulnerable: the proposed action may impact an important population of the species leading to a long-term decline.	
• Kangaloon Sun Orchid (*Thelymitra kangaloonica*) – critically endangered: the species is likely to occur within the project site and impacts to the species could lead to a population decline.	
• Prickly Bush-pea (*Pultenaea aristata*) – vulnerable: part of this species' range lies within 10 km of the proposed action area, and is associated with the Upland Swamp vegetation complex, and altered hydrology could negatively impact this species habitat.	
• Deane's Melaleuca (*Melaleuca deanei*) – vulnerable: the species is highly fragmented, and all habitat is considered critical habitat, therefore the project could significantly impact this species.	

Table A2-2 (Continued)
EPBC Act Assessment Requirements Reference Summary

Assessment Requirement	EIS Reference
• Hairy Geebung, Hairy Persoonia (*Persoonia hirsuta*) – endangered: the proposed action could fragment an already scattered species leading to a reduction in the area of occupancy.	
• Scrub Turpentine, Brown Malletwood (*Rhodamnia rubescens*) – critically endangered: the species has experienced significant decline, and there is the potential for the proposed action to reduce the area of occupancy of this species.	
A water resource, in relation to coal seam gas development and large coal mining development (s24D and s24E)	
• The proposed action is likely to have significant impacts on groundwater and surface water resources and quality and may result in a change to: ○ the hydrology of a water resource ○ water quality of a water resource. The above may not be a complete list and it is the responsibility of the proponent to ensure any protected matters under these controlling provisions are assessed for the Commonwealth decisionmaker's consideration.	Appendices B and C

Table A2-3
Reconciliation of the EIS against IESC Information Guidelines Requirements

Assessment Requirement	EIS Reference
Description of the proposal	
• Provide a regional overview of the proposed project area including a description of the: – geological basin; – coal resource; – surface water catchments; – groundwater systems; – water-dependent assets; and – past, present and reasonably foreseeable coal mining and CSG developments.	Sections 1, 4, 7.5 to 7.9, Attachment 7 and Appendices A, B, C, D and E
• Describe the proposal's location, purpose, scale, duration, disturbance area, and the means by which it is likely to have a significant impact on water resources and water-dependent assets.	Sections 4, 7.5, 7.6, 7.7, 7.8 and 7.9; Appendices B and C
• Describe the statutory context, including information on the proposal's status within the regulatory assessment process, and any applicable water management policies or regulations, including state or Commonwealth regulation of potentially impacted water resources, should be provided.	Sections 1 and 5; Attachments 6, 7 and 8
• Describe how impacted water resources are currently being regulated under state or Commonwealth law, including whether there are any applicable standard conditions.	Section 2; Attachments 6, 7 and 8
Risk Assessment	
• Identify and assess all potential environmental risks to water resources and water-related assets, and their possible impacts. In selecting a risk assessment approach consideration should be given to the complexity of the project, and the probability and potential consequences of risks.	Appendices B, C, D, E, M and P
• Assess risks following the implementation of any proposed mitigation and management options to determine if these will reduce risks to an acceptable level based on the identified environmental objectives.	Appendices B, C, D and E
• Incorporate causal mechanisms and pathways identified in the risk assessment in conceptual and numerical modelling. Use the results of these models to update the risk assessment.	Appendices B, C, D and E
• The risk assessment should include an assessment of: – all potential cumulative impacts which could affect water resources and water-related assets; and – mitigation and management options which the proponent could implement to reduce these impacts.	Sections 7.5 to 7.9; Appendices B, C, D and E
Groundwater	
Context and conceptualization	
• Describe and map geology at an appropriate level of horizontal and vertical resolution including: – definition of the geological sequence(s) in the area, with names and descriptions of the formations and accompanying surface geology, cross-sections and any relevant field data. – geological maps appropriately annotated with symbols that denote fault type, throw and the parts of sequences the faults intersect or displace.	Sections 4.1 and 7.5.4; Section 3 of Appendix B; Appendix P

Table A2-3 (Continued)
Reconciliation of the EIS against IESC Information Guidelines Requirements

Assessment Requirement	EIS Reference
• Define and describe or characterise significant geological structures (e.g. faults, folds, intrusives) and associated fracturing in the area and their influence on groundwater – particularly groundwater flow, discharge or recharge. – Site-specific studies (e.g. geophysical, coring / wireline logging etc.) should give consideration to characterising and detailing the local stress regime and fault structure (e.g. damage zone size, open/closed along fault plane, presence of clay/shale smear, fault jogs or splays). – Discussion on how this fits into the fault's potential influence on regional-scale groundwater conditions should also be included.	Sections 4.1 and 7.5 and Appendices B and P
• Provide site-specific values for hydraulic parameters (e.g. vertical and horizontal hydraulic conductivity and specific yield or specific storage characteristics including the data from which these parameters were derived) for each relevant hydrogeological unit. In situ observations of these parameters should be sufficient to characterise the heterogeneity of these properties for modelling.	Appendix B
• Provide time series level and water quality data representative of seasonal and climatic cycles.	Appendix B
• Provide data to demonstrate the varying depths to the hydrogeological units and associated standing water levels or potentiometric heads, including direction of groundwater flow, contour maps, and hydrographs. All boreholes used to provide this data should have been surveyed.	Appendix B
• Provide hydrochemical (e.g. acidity/alkalinity, electrical conductivity, metals, and major ions) and environmental tracer (e.g. stable isotopes of water, tritium, helium, strontium isotopes, etc.) characterisation to identify sources of water, recharge rates, transit times in aquifers, connectivity between geological units and groundwater discharge locations.	Appendix B
• Describe the likely recharge, discharge and flow pathways for all hydrogeological units likely to be impacted by the proposed development.	Appendix B
• Assess the frequency (and time lags if any), location, volume and direction of interactions between water resources, including surface water/groundwater connectivity, inter-aquifer connectivity and connectivity with sea water.	Appendices B and C
Analytical and numerical modelling	
• Provide a detailed description of all analytical and/or numerical models used, and any methods and evidence (e.g. expert opinion, analogue sites) employed in addition to modelling.	Attachment 5 and Appendix B
• Undertaken groundwater modelling in accordance with the *Australian Groundwater Modelling Guidelines* (Barnett et al. 2012), including independent peer review.	Attachment 5 and Appendix B
• Calibrate models with adequate monitoring data, ideally with calibration targets related to model prediction (e.g. use baseflow calibration targets where predicting changes to baseflow).	Appendix B
• Describe each hydrogeological unit as incorporated in the groundwater model, including the thickness, storage and hydraulic characteristics, and linkages between units, if any.	Appendix B
• Describe the existing recharge/discharge pathways of the units and the changes that are predicted to occur upon commencement, throughout, and after completion of the proposed project.	Appendix B
• Describe the various stages of the proposed project (construction, operation and rehabilitation) and their incorporation into the groundwater model. Provide predictions of water level and/or pressure declines and recovery in each hydrogeological unit for the life of the project and beyond, including surface contour maps for all hydrogeological units.	Appendix B
• Identify the volumes of water predicted to be taken annually with an indication of the proportion supplied from each hydrogeological unit.	Section 7.5, Attachment 8 and Appendix B
• Undertake model verification with past and/or existing site monitoring data.	Appendix B
• Provide an explanation of the model conceptualisation of the hydrogeological system or systems, including multiple conceptual models if appropriate. Key assumptions and model limitations and any consequences should also be described.	Appendix B

Table A2-3 (Continued)
Reconciliation of the EIS against IESC Information Guidelines Requirements

Assessment Requirement	EIS Reference
• Consider a variety of boundary conditions across the model domain, including constant head or general head boundaries, river cells and drains, to enable a comparison of groundwater model outputs to seasonal field observations.	Appendix B
• Undertake sensitivity analysis and uncertainty analysis of boundary conditions and hydraulic and storage parameters, and justify the conditions applied in the final groundwater model (see Middlemis and Peeters, 2018).	Appendix B
• Provide an assessment of the quality of, and risks and uncertainty inherent in, the data used to establish baseline conditions and in modelling, particularly with respect to predicted potential impact scenarios.	Appendix B
• Undertake an uncertainty analysis of model construction, data, conceptualisation and predictions (see Middlemis and Peeters, 2018).	Appendix B
• Provide a program for review and update of models as more data and information become available, including reporting requirements.	Sections 7.5 and 7.5 and Appendix B
• Provide information on the magnitude and time for maximum drawdown and post-development drawdown equilibrium to be reached.	Appendix B
Impacts to water resources and water-dependent assets	
• Provide an assessment of the potential impacts of the proposal, including how impacts are predicted to change over time and any residual long-term impacts. Consider and describe: – any hydrogeological units that will be directly or indirectly dewatered or depressurised, including the extent of impact on hydrological interactions between water resources, surface water/groundwater connectivity, interaquifer connectivity and connectivity with sea water. – the effects of dewatering and depressurisation (including lateral effects) on water resources, water-dependent assets, groundwater, flow direction and surface topography, including resultant impacts on the groundwater balance. – the potential impacts on hydraulic and storage properties of hydrogeological units, including changes in storage, potential for physical transmission of water within and between units, and estimates of likelihood of leakage of contaminants through hydrogeological units. – the possible fracturing of and other damage to confining layers. – For each relevant hydrogeological unit, the proportional increase in groundwater use and impacts as a consequence of the proposed project, including an assessment of any consequential increase in demand for groundwater from towns or other industries resulting from associated population or economic growth due to the proposal.	Sections 7.5, 7.5, 7.6 and 7.8 and Appendices B, C, D and E
• Describe the water resources and water-dependent assets that will be directly impacted by mining or CSG operations, including hydrogeological units that will be exposed/partially removed by open cut mining and/or underground mining.	Section 7.5, Attachment 8 and Appendices B, C, D and E
• For each potentially impacted water resource, provide a clear description of the impact to the resource, the resultant impact to any water-dependent assets dependent on the resource, and the consequence or significance of the impact.	Section 7.5, Attachment 8 and Appendices B, C, D and E
• Describe existing water quality guidelines, environmental flow objectives and other requirements (e.g. water planning rules) for the groundwater basin(s) within which the development proposal is based.	Section 7.5 and Appendix B
• Provide an assessment of the cumulative impact of the proposal on groundwater when all developments (past, present and/or reasonably foreseeable) are considered in combination.	Section 7.5 and Appendix B
• Describe proposed mitigation and management actions for each significant impact identified, including any proposed mitigation or offset measures for long-term impacts post mining.	Sections 7.5 and 7.5 and Appendix B
• Provide a description and assessment of the adequacy of proposed measures to prevent/minimise impacts on water resources and water-dependent assets.	Sections 7.5 to 7.5 and Appendix B

Table A2-3 (Continued)
Reconciliation of the EIS against IESC Information Guidelines Requirements

Assessment Requirement	EIS Reference
Data and monitoring	
• Provide sufficient data on physical aquifer parameters and hydrogeochemistry to establish pre-development conditions, including fluctuations in groundwater levels at time intervals relevant to aquifer processes.	Appendix B
• Develop and describe a robust groundwater monitoring program using dedicated groundwater monitoring wells – including nested arrays where there may be connectivity between hydrogeological units – and targeting specific aquifers, providing an understanding of the groundwater regime, recharge and discharge processes and identifying changes over time.	Sections 7.5, 7.5 and 7.5 and Appendix B
• Develop and describe proposed targeted field programs to address key areas of uncertainty, such as the hydraulic connectivity between geological formations, the sources of groundwater sustaining GDEs, the hydraulic properties of significant faults, fracture networks and aquitards in the impacted system, etc., where appropriate.	Sections 7.5 and 7.5 and Appendices B and P
• Provide long-term groundwater monitoring data, including a comprehensive assessment of all relevant chemical parameters to inform changes in groundwater quality and detect potential contamination events.	Appendix B
• Ensure water quality monitoring complies with relevant National Water Quality Management Strategy (NWQMS) guidelines (ANZECC/ARMCANZ 2000) and relevant legislated state protocols (e.g. Qld Government 2013).	Appendix B
Surface water	
Context and conceptualisation	
• Describe the hydrological regime of all watercourses, standing waters and springs across the site including: – geomorphology, including drainage patterns, sediment regime and floodplain features; – spatial, temporal and seasonal trends in streamflow and/or standing water levels; – spatial, temporal and seasonal trends in water quality data (such as turbidity, acidity, salinity, relevant organic chemicals, metals, metalloids and radionuclides); and – current stressors on watercourses, including impacts from any currently approved projects.	Sections 7.5 and 7.6 and Appendices B and C
• Describe the existing flood regime, including flood volume, depth, duration, extent and velocity for a range of annual exceedance probabilities. Provide flood hydrographs and maps identifying peak flood extent, depth and velocity. This assessment should be informed by topographic data that has been acquired using lidar or other reliable survey methods with accuracy stated.	Appendix C
• Provide an assessment of the frequency, volume, seasonal variability and direction of interactions between water resources, including surface water/ groundwater connectivity and connectivity with sea water.	Appendices B and C
Analytical and numerical modelling	
• Provide conceptual models at an appropriate scale, including water quality, stores, flows and use of water by ecosystems.	Appendix C
• Use methods in accordance with the most recent publication of *Australian Rainfall and Runoff* (Ball et al. 2016).	Calibrated AWMB parameters adopted.
• Develop and describe a program for review and update of the models as more data and information becomes available.	Section 7.6 and Attachment 10
• Describe and justify model assumptions and limitations, and calibrate with appropriate surface water monitoring data.	Appendix C
• Provide an assessment of the risks and uncertainty inherent in the data used in the modelling, particularly with respect to predicted scenarios.	Appendix C
• Provide a detailed description of any methods and evidence (e.g. expert opinion, analogue sites) employed in addition to modelling.	Attachment 5

Table A2-3 (Continued)
Reconciliation of the EIS against IESC Information Guidelines Requirements

Assessment Requirement	EIS Reference
Impacts to water resources and water-dependent assets	
• Describe all potential impacts of the proposed project on surface waters. Include a clear description of the impact to the resource, the resultant impact to any assets dependent on the resource (including water-dependent ecosystems such as riparian zones and floodplains), and the consequence or significance of the impact. Consider: – impacts on streamflow under the full range of flow conditions. – impacts associated with surface water diversions. – impacts to water quality, including consideration of mixing zones. – the quality, quantity and ecotoxicological effects of operational discharges of water (including saline water), including potential emergency discharges, and the likely impacts on water resources and water-dependent assets. – landscape modifications such as subsidence, voids, post rehabilitation landform collapses, on-site earthworks (including disturbance of acid-forming or sodic soils, roadway and pipeline networks) and how these could affect surface water flow, surface water quality, erosion, sedimentation and habitat fragmentation of water-dependent species and communities.	Section 7.6 and Appendices A and C
• Discuss existing water quality guidelines, environmental flow objectives and requirements for the surface water catchment(s) within which the development proposal is based.	Section 7.6 and Appendix C
• Identify processes to determine surface water quality guidelines and quantity thresholds which incorporate seasonal variation but provide early indication of potential impacts to assets.	Sections 7.6, 7.6 and 7.6 and Appendix C
• Propose mitigation actions for each identified significant impact.	Section 7.6, Attachment 10 and Appendix C
• Describe the adequacy of proposed measures to prevent or minimise impacts on water resources and water-dependent assets.	Section 7.6, Attachment 10 and Appendix C
• Describe the cumulative impact of the proposal on surface water resources and water-dependent assets when all developments (past, present and reasonably foreseeable) are considered in combination.	Section 7.6 and Appendices B and C;
• Provide an assessment of the risks of flooding (including channel form and stability, water level, depth, extent, velocity, shear stress and stream power), and impacts to ecosystems, project infrastructure and the final project landform.	Appendix C
Data and monitoring	
• Identify monitoring sites representative of the diversity of potentially affected water-dependent assets and the nature and scale of potential impacts, and match with suitable replicated control and reference sites (BACI design) to enable detection and monitoring of potential impacts.	Section 7.6, Attachment 10 and Appendix C
• Ensure water quality monitoring complies with relevant National Water Quality Management Strategy (NWQMS) guidelines (ANZECC/ARMCANZ 2000) and relevant legislated state protocols (e.g. Qld Government 2013).	Section 7.6, Attachment 10 and Appendix C
• Identify data sources, including streamflow data, proximity to rainfall stations, data record duration and describe data methods, including whether missing data have been patched.	Appendix C
• Develop and describe a surface water monitoring program that will collect sufficient data to detect and identify the cause of any changes from established baseline conditions, and assess the effectiveness of mitigation and management measures. The program will: – include baseline monitoring data for physico-chemical parameters, as well as contaminants (e.g. metals); – comparison of physico-chemical data to national/regional guidelines or to site-specific guidelines derived from reference condition monitoring if available; and – identify baseline contaminant concentrations and compare these to national guidelines, allowing for local background correction if required.	Sections 7.6, 7.6 and 7.6 and Appendix C

Table A2-3 (Continued)
Reconciliation of the EIS against IESC Information Guidelines Requirements

Assessment Requirement	EIS Reference
• Describe the rationale for selected monitoring parameters, duration, frequency and methods, including the use of satellite or aerial imagery to identify and monitor largescale impacts.	Appendix C
• Develop and describe a plan for ongoing ecotoxicological monitoring, including direct toxicity assessment of discharges to surface waters where appropriate.	Sections 7.6 and 7.6 and Appendix C and E
• Identify dedicated sites to monitor hydrology, water quality, and channel and floodplain geomorphology throughout the life of the proposed project and beyond.	Sections 7.6, 7.6 and 7.6 and Appendix C
Water-dependent assets	
Context and conceptualisation	
• Identify water-dependent assets, including: – water-dependent fauna and flora and provide surveys of habitat, flora and fauna (including stygofauna) (see Doody et al. [in press]). – public health, recreation, amenity, Indigenous, tourism or agricultural values for each water resource.	Attachment 7 and Appendices C, D, E and L
• Identify GDEs in accordance with the method outlined by Eamus et al. (2006). Information from the GDE Toolbox (Richardson et al. 2011) and GDE Atlas (CoA 2017a) may assist in identification of GDEs (see Doody et al. [in press]).	Section 7.5 and Appendices B, D and E
• Describe the conceptualisation and rationale for likely water-dependence, impact pathways, tolerance and resilience of water-dependent assets. Examples of ecological conceptual models can be found in Commonwealth of Australia (2015).	Sections 7.5 to 7.9 and Appendices B, C, D and E
• Estimate the ecological water requirements of identified GDEs and other water-dependent assets (see Doody et al. [in press]).	Sections 7.5, 7.7, 7.8 and 7.9 and Appendices B, D and E
• Identify the hydrogeological units on which any identified GDEs are dependent (see Doody et al. [in press]).	Appendix B
• Provide an outline of the water-dependent assets and associated environmental objectives and the modelling approach to assess impacts to the assets.	Sections 7.5, 7.6, 7.7, 7.8, 7.9 and Appendices B, C, D and E
• Describe the process employed to determine water quality and quantity triggers and impact thresholds for water-dependent assets (e.g. threshold at which a significant impact on an asset may occur).	Sections 7.5 to 7.8 and Appendices B, C, D and E
Impacts, risk assessment and management of risks	
• Provide an assessment of direct and indirect impacts on water-dependent assets, including ecological assets such as flora and fauna dependent on surface water and groundwater, springs and other GDEs (see Doody et al. [in press]).	Sections 7.5, 7.6, 7.7, 7.8, 7.9 and Appendices B, C, D and E
• Describe the potential range of drawdown at each affected bore, and clearly articulate of the scale of impacts to other water users.	Section 7.5 and Appendix B
• Indicate the vulnerability to contamination (e.g. from salt production and salinity) and the likely impacts of contamination on the identified water-dependent assets and ecological processes.	Section 7.5, 7.6 and 7.7 and Appendices B, C, D and E
• Identify and consider landscape modifications (e.g. voids, on-site earthworks, and roadway and pipeline networks) and their potential effects on surface water flow, erosion and habitat fragmentation of water-dependent species and communities.	Sections 4, 7.6, 7.7, 7.8 and 7.9 and Appendices C, D and E
• Provide estimates of the volume, beneficial uses and impact of operational discharges of water (particularly saline water), including potential emergency discharges due to unusual events, on water-dependent assets and ecological processes.	Section 7.6 and Appendix C

Table A2-3 (Continued)
Reconciliation of the EIS against IESC Information Guidelines Requirements

Assessment Requirement	EIS Reference
• Assess the overall level of risk to water-dependent assets through combining probability of occurrence with severity of impact.	Sections 7.5, 7.6, 7.7, 7.8 and 7.9 and Appendices B, C, D and E
• Identify the proposed acceptable level of impact for each water-dependent asset based on leading-practice science and site-specific data, and ideally developed in conjunction with stakeholders.	Sections 7.5, 7.6, 7.7, 7.8 and 7.9 and Appendices B, C, D and E
• Propose mitigation actions for each identified impact, including a description of the adequacy of the proposed measures and how these will be assessed.	Sections 7.5, 7.6, 7.7, 7.8 and 7.9 and Appendices B, C, D and E
Data and monitoring	
• Identify an appropriate sampling frequency and spatial coverage of monitoring sites to establish pre-development (baseline) conditions, and test potential responses to impacts of the proposal (see Doody et al. [in press]).	Sections 7.5, 7.6, 7.7, 7.8 and 7.9 and Appendices B, C, D and E
• Consider concurrent baseline monitoring from unimpacted control and reference sites to distinguish impacts from background variation in the region (e.g. BACI design, see Doody et al. [in press]).	Appendices B, C, D and E
• Develop and describe a monitoring program that identifies impacts, evaluates the effectiveness of impact prevention or mitigation strategies, measures trends in ecological responses and detects whether ecological responses are within identified thresholds of acceptable change (see Doody et al. [in press]).	Section 7.5, 7.6, 7.7, 7.8 and 7.9, Attachment 10 and Appendices B, C, D and E
• Describe the proposed process for regular reporting, review and revisions to the monitoring program	Section 7.5, 7.6, 7.7, 7.8 and 7.9 and Attachment 10
• Ensure ecological monitoring complies with relevant state or national monitoring guidelines (e.g. the DSITI guideline for sampling stygofauna [Qld Government 2015]).	Sections 7.7 and 7.9 and Appendices D and E.
Water and salt balance and water management strategy	
• Provide a quantitative site water balance model describing the total water supply and demand under a range of rainfall conditions and allocation of water for mining activities (e.g. dust suppression, coal washing etc.), including all sources and uses.	Appendix C
• Describe the water requirements and on-site water management infrastructure, including modelling to demonstrate adequacy under a range of potential climatic conditions.	Section 4.9 and Appendix C
• Provide estimates of the quality and quantity of operational discharges under dry, median and wet conditions, potential emergency discharges due to unusual events and the likely impacts on water-dependent assets.	Section 7.6.4 and Appendix C
• Provide salt balance modelling that includes stores and the movement of salt between stores, and takes into account seasonal and long-term variation.	Appendix C
Cumulative impacts	
Context and conceptualisation	
• Provide cumulative impact analysis with sufficient geographic and temporal boundaries to include all potentially significant water-related impacts.	Section 7.5 and 7.6 and Appendices B and C
• Consider all past, present and reasonably foreseeable actions, including development proposals, programs and policies that are likely to impact on the water resources of concern in the cumulative impact analysis. Where a proposed project is located within the area of a bioregional assessment consider the results of the bioregional assessment.	Sections 1.2, 7.5 and 7.6 and Appendices B and C
Impacts	
• Provide an assessment of the condition of affected water resources which includes: – identification of all water resources likely to be cumulatively impacted by the proposed development; – a description of the current condition and quality of water resources and information on condition trends;	Sections 7.5, 7.6 and 7.7; Appendices B, C and E

Table A2-3 (Continued)
Reconciliation of the EIS against IESC Information Guidelines Requirements

Assessment Requirement	EIS Reference
– identification of ecological characteristics, processes, conditions, trends and values of water resources; – adequate water and salt balances; and – identification of potential thresholds for each water resource and its likely response to change and capacity to withstand adverse impacts (e.g. altered water quality, drawdown).	Section 7.5, 7.6, 7.7, 7.8 and 7.9 and Appendices B, C, D and E
• Assess the cumulative impacts to water resources considering: – the full extent of potential impacts from the proposed project, (including whether there are alternative options for infrastructure and mine configurations which could reduce impacts), and encompassing all linkages, including both direct and indirect links, operating upstream, downstream, vertically and laterally; – all stages of the development, including exploration, operations and post closure / decommissioning; – appropriately robust, repeatable and transparent methods; – the likely spatial magnitude and timeframe over which impacts will occur, and significance of cumulative impacts; and – opportunities to work with other water users to avoid, minimise or mitigate potential cumulative impacts.	Sections 4, 7 and 8; Appendices B, C, D and E
Mitigation, monitoring and management	
• Identify modifications or alternatives to avoid, minimise or mitigate potential cumulative impacts. Evidence of the likely success of these measures (e.g. case studies) should be provided.	Sections 7.5, 7.6 and 8 and Appendices B and C
• Identify measures to detect and monitor cumulative impacts, pre and post development, and assess the success of mitigation strategies.	Sections 7.5 and 7.6 and Appendices B and C
• Identify cumulative impact environmental objectives.	Appendices B and C
• Describe appropriate reporting mechanisms.	Appendices B and C
• Propose adaptive management measures and management responses.	Sections 7.5 and 7.6 and Appendices B and C
Subsidence – underground coal mines and coal seam gas	
• Provide predictions of subsidence impact on surface topography, water-dependent assets, groundwater (including enhanced connectivity between aquifers) and the movement of water across the landscape (See CoA 2014b; CoA 2014c). Consider multiple methods of predictions and apply the most appropriate method. Consider the limitations of each method including the adequacy of empirical data and site-specific geological conditions and justify the selected method.	Section 7.3 and Appendix A
• Describe subsidence monitoring methods, including the use of remote or on-ground techniques and explain the predicted accuracy of such techniques.	Section 7.3 and Appendix A
• Provide an assessment of both conventional and unconventional subsidence. For project expansions, an evaluation of past or current effects of geological structures on subsidence and implications for water resources and water-dependent assets should be provided.	Section 7.3 and Appendix A
• Consider geological strata and their properties (strength/hardness/fracture propagation) in the subsidence analysis and/or modelling. Anomalous and near-surface ground movements with implications for water resources and compaction of unconsolidated sediment should also be considered.	Sections 4.2 and 7.3 and Appendix A

Table A2-3 (Continued)
Reconciliation of the EIS against IESC Information Guidelines Requirements

Assessment Requirement	EIS Reference
Final landform and voids – coal mines	
• Identify and consider landscape modifications (e.g. voids, on-site earthworks, and roadway and pipeline networks) and their potential effects on surface water flow, erosion, sedimentation and habitat fragmentation of water-dependent species and communities.	Sections 4, 7.6, 7.7 and 7.9 and Appendices C, D and E
• Assess the adequacy of modelling, including surface water and groundwater quantity and quality, lake behaviour, timeframes and calibration.	N/A
• Provide an evaluation of stability of void slopes where failure during extreme events or over the long term (for example due to aquifer recovery causing geological heave and landform failure) may have implications for water quality.	N/A
• Evaluate mitigating inflows of saline groundwater by planning for partial backfilling of final voids.	N/A
• Provide an assessment of the long-term impacts to water resources and water-dependent assets posed by various options for the final landform design, including complete or partial backfilling of mining voids. Assessment of the final landform for which approval is being sought should consider: – groundwater behaviour – sink or lateral flow from void. – water level recovery – rate, depth, and stabilisation point (e.g. timeframe and level in relation to existing groundwater level, surface elevation). – seepage – geochemistry and potential impacts. – long-term water quality, including salinity, pH, metals and toxicity. – measures to prevent migration of void water off-site.	N/A
• For other final landform options considered sufficient detail of potential impacts should be provided to clearly justify the proposed option.	N/A
• Assess the probability of overtopping of final voids with variable climate extremes, and management mitigations.	N/A
Acid-forming materials and other contaminants of concern	
• Identify the presence and potential exposure of acid-sulphate soils (including oxidation from groundwater drawdown).	Appendix O
• Identify the presence and volume of potentially acid-forming waste rock, fine-grained amorphous sulphide minerals and coal reject/tailings material and exposure pathways.	Section 4.8.2
• Identify other sources of contaminants, such as high metal concentrations in groundwater, leachate generation potential and seepage paths.	Appendix B
• Describe handling and storage plans for acid-forming material (co-disposal, tailings dam, and encapsulation).	N/A
• Assess the potential impact to water-dependent assets, taking into account dilution factors, and including solute transport modelling where relevant, representative and statistically valid sampling, and appropriate analytical techniques.	Sections 7.5, 7.6, 7.7, 7.8 and 7.9 and Appendices B, C, D and E
• Describe proposed measures to prevent/minimise impacts on water resources, water users and water-dependent ecosystems and species.	Sections 7.5, 7.6, 7.7, 7.8 and 7.9 and Appendices B, C, D and E
CSG well construction and operation	
• Describe the scale of fracturing (number of wells, number of fracturing events per well), types of wells to be stimulated (vertical versus horizontal), and other forms of well stimulation (cavitation, acid flushing).	N/A
• Describe proposed measuring and monitoring of fracture propagation.	N/A
• Identify water source for drilling and hydraulic stimulation, and outline the volume of fluid and mass balance (quantities/volumes).	N/A
• Describe the rules (e.g. water sharing plans) covering access to each water source used for drilling and hydraulic stimulation and how the project proposes to comply with them.	N/A
• Quantify and describe the quality and toxicity of flowback and produced water and how it will be treated and managed.	N/A

Table A2-3 (Continued)
Reconciliation of the EIS against IESC Information Guidelines Requirements

Assessment Requirement	EIS Reference
• Assess the potential for inter-aquifer leakage or contamination.	N/A
• The use of drilling and hydraulic fracturing chemicals should be informed by appropriately tiered deterministic and/or probabilistic hazard and risk assessments, based on ecotoxicological testing consistent with Australian Government testing guidelines (see CoA 2012; MRMMC-EPHC-NHMRC 2009).	N/A
• Propose waste management measures (including salt and brines) during both operations and legacy after closure.	N/A
• List the chemicals proposed for use in drilling and hydraulic stimulation including: – names of the companies producing fracturing fluids and associated products; – proprietary names (trade names) of compounds (fracturing fluid additives) being produced; – chemical names of each additive used in each of the fluids; – Chemical Abstract Service (CAS) numbers of each of the chemical components used in each of the fluids; – general purpose and function of each of the chemicals used; – mass or volume proposed for use; – maximum concentration (mg/L or g/kg) of the chemicals used; – chemical half-life data, partitioning data, and volatilisation data; – ecotoxicology; and – any material safety data sheets for the chemicals or chemical products used.	N/A
• Chemicals for use in drilling and hydraulic fracturing must be identified as being approved for import, manufacture or use in Australia (that is, confirmed by NICNAS as being listed in the Australian Inventory of Chemical Substances (see CoA 2017b).	N/A