

Assessment Methodology

BORDER TO GOWRIE REVISED DRAFT ENVIRONMENTAL IMPACT STATEMENT



Inland Rail is a subsidiary of Australian Rail Track Corporation

Contents

4.	ASSESSMENT METHODOLOGY	4-1
4.1	Introduction	4-1
4.2	Approach	4-1
4.3	Project terms	4-2
4.4	Impact assessment methods	4-2
4.4.1	Compliance assessment	4-4
4.4.2	Risk assessment	4-4
4.4.3	Significance assessment	4-7
4.4.4	Cumulative impact assessment	4-8
4.5	Mitigation and management measures	4-11
4.6	Draft Outline Environmental Management Plan	4-12

Figures		
Figure 4-1	Assessment method decision tree	4-3
Figure 4-2	Process for the assessment of impacts and the staged application of mitigation measures	1_12
0	impacts and the staged application of mitigation measures	4-12

Tables

Table 4-1	Project terms	4-2
Table 4-2	Assessment methods	4-3
Table 4-3	Likelihood criteria	4-4
Table 4-4	Consequence criteria	4-5
Table 4-5	Risk matrix	4-6
Table 4-6	Sensitivity criteria	4-7
Table 4-7	Magnitude criteria	4-8
Table 4-8	Significance matrix	4-8
Table 4-9	Significance classifications	4-8
Table 4-10	Discipline approach to cumulative impact assessment	4-9
Table 4-11	Assessment matrix	4-10
Table 4-12	Impact significance	4-10
Table 4-13	Risk assessment ratings, NSW DP&E Social Impact Assessment	
	Guidelines	4-11
l able 4-14	Consequence definitions	4-11

4. Assessment Methodology

4.1 Introduction

This chapter describes the methodology used to assess potential impacts and opportunities as a result of the Inland Rail—Border to Gowrie Project (the Project) including addressing the Terms of Reference (ToR), submissions and Coordinator-General request for additional information following public notification of the draft Environmental Impact Statement (EIS). The methodology has been developed to provide a structured and objective approach to identifying environmental, social and economic impacts and opportunities, develop effective mitigation and management measures, and maximise the benefits of the Project.

During the corridor selection process, multi-criteria analyses and comparative cost estimates were used to assess potential impacts associated with a range of route options for the Project. The methodology adopted for the corridor selection process is discussed separately in Chapter 2: Project Rationale.

4.2 Approach

The first step in the impact assessment process was to prepare a Project description. Chapter 5: Project Description includes information on the scale, type, duration and location of Project elements that were assessed.

Then, for each specific matter addressed in chapters 8 to 22:

- The impact assessment area was defined. The impact assessment area defines the geographical extent of the impact assessment for each specific matter. The impact assessment area is defined based on the nature of the specific matter, and the scale, type and duration of Project elements that may impact on that matter
- The impact assessment method was selected (Section 4.4)
- A desktop review of existing reports, studies and spatial datasets was undertaken to establish existing conditions and sensitive receptors relevant to the specific matters being assessed
- Fieldwork was undertaken to identify and/or ground truth existing environmental conditions and sensitive receptors. Further detail on desktop reviews and fieldwork is provided in chapters 8 to 22
- Potential impacts and opportunities were identified in accordance with the selected impact assessment method and assessed using criteria set out in legislation, statutes, guidelines or policies. Where such criteria do not exist, the assessment was based on industry standards and professional judgement. In each instance, the impact assessment was conducted as follows:
 - The impact assessment considered the detailed design, pre-construction and early works, construction works, commissioning, and operations stages of the Project. The decommissioning of the Project cannot be foreseen at this point in time and therefore has not been considered as a Project stage in this revised draft EIS.
 - > The impact assessment considered short-term, long-term and cumulative impacts.
 - Revised reference design stage mitigation measures were factored into the initial impact assessment using the methods described in Sections 4.4.1 to 4.4.3.
 - Additional mitigation and management measures were proposed to further avoid or minimise impacts and enhance potential benefits (Section 4.5). These measures were factored into the assessment of residual impacts.
 - The need to offset or compensate for significant adverse residual impacts were assessed using the methods described in Sections 4.4.1 to 4.4.3.
- Mitigation and management measures were documented in chapters 8 to 22 and consolidated in Chapter 24: Draft Outline Environmental Management Plan (Section 4.6).

The role of community and stakeholder consultation in the impact assessment process is discussed in Section 4.4.4.

4.3 Project terms

The following terms are used throughout the revised draft EIS to describe the Project, and the relevant assessment areas.

TABLE 4-1 PROJECT TERMS

Project term	Definition
Project footprint	The Project footprint is the area required to accommodate all permanent and temporary components of the Project and includes the permanent footprint and the temporary footprint.
Permanent footprint	The area required to accommodate permanent infrastructure associated with the Project, including rail, road and other miscellaneous infrastructure. Rail infrastructure includes rail tracks, crossing loops, turnouts, earthworks, bridges, drainage, level crossings, grade separations, rail maintenance access roads, signalling and fencing. Road-related works resulting from the Project encompass new and upgraded roads, realignments and diversions, intersection improvements and closures.
Temporary footprint	The area required to accommodate construction activities and facilities of a temporary nature and duration to support the Project. The temporary footprint is generally wider than the permanent footprint to allow for the construction of Project elements including fencing, drainage controls including erosion and sediment measures, temporary stockpiling, and soil and cleared vegetation, and to allow necessary construction access and turnaround provisions. Temporary Project facilities include laydowns, site office areas, non-resident workforce accommodation, a material distribution centre, concrete batch plants and borrow pits.
Impact assessment area	The impact assessment area is defined as the area with the potential to be directly or indirectly affected by the specific aspects of Project activity (for example, by noise and vibration, visual or traffic impacts). The actual size and extent of the impact assessment area varies according to the nature and requirements of each specific matter. The impact assessment area adopted for the assessment of each specific matter, additional management and mitigation measures identified, and commitments associated with corridor alignment changes have been made in the corresponding chapters in the revised draft EIS.
Rail corridor	The area required to operate a railway.
Sensitive receptors	Sensitive receptors can be a place, natural feature, structure or, communities and person or organism that is susceptible to impact. Throughout this revised draft EIS, sensitive receptors are identified for the purpose of establishing the likelihood and consequences of potential impacts potentially instigated by specific environmental aspects.

4.4 Impact assessment methods

Three methods were used to assess potential impacts and opportunities for the Project:

- Compliance assessment (quantitative)
- Risk assessment (qualitative)
- Significance assessment (qualitative).

A general explanation of each assessment method and how it was applied is provided in Sections 4.4.1 to 4.4.3, with further details specific to each matter included in chapters 8 to 22.

For each specific matter, the decision tree shown in Figure 4-1 was followed to select an appropriate impact assessment method.



FIGURE 4-1 ASSESSMENT METHOD DECISION TREE

The assessment methods and the specific matters they have been applied to, are summarised in Table 4-2. In some cases, the assessment method was adapted to meet the needs of a particular matter. For example, construction stage air quality impacts were assessed using the risk assessment method due to the complex, dynamic and multi-faceted nature of construction activities. On the other hand, operations stage air quality impacts were assessment method because confidence around operational parameters for the Project enabled emission sources to be modelled for comparison against adopted performance criteria.

Method	Туре	Relevance	Specific matters
Compliance assessment	Quantitative	Used where compliance with a known guideline or standard (e.g. published limits or thresholds) can be quantitatively assessed	Land use and tenure Land resources (soil properties only) Flora and fauna (significant impact assessment) Air quality (operation stage) Hydrology and flooding Noise and vibration Traffic Economics
Risk assessment	Qualitative	Used where an impact may occur	Land resources Transport and access Hazard and risk Waste management Indigenous cultural heritage

TABLE 4-2 ASSESSMENT METHODS

Method	Туре	Relevance	Specific matters
Significance assessment	Qualitative	Used where an impact will occur to assess the sensitivity or the vulnerability of the environmental value to the impact	Landscape and visual amenity Flora and fauna (cumulative impact assessment) Air quality (construction stage) Surface water Groundwater Social Non-Indigenous cultural heritage

This revised draft EIS also includes a cumulative impact assessment (CIA). The CIA considers the combined effects of the Project, and relevant existing and proposed developments on specific matters. The CIA method is described in Chapter 23: Cumulative Impacts.

4.4.1 Compliance assessment

The compliance assessment method was applied to specific matters with quantifiable impacts (e.g. emissions and discharges from Project infrastructure and activities). Mapping, modelling and data (publicly available and field verified) were used to assess compliance with performance criteria adopted from applicable legislation, statutes, guidelines or policies.

Compliance with the adopted performance criteria was initially assessed based on the application of revised reference design-stage mitigation measures. Additional mitigation and management measures were then proposed for implementation in future stages of the Project. These additional mitigation and management measures were nominated to:

- Achieve compliance with the adopted performance criteria, if required
- Demonstrate Australian Rail Track Corporation's (ARTC's) commitment to avoiding or minimising potential impacts, regardless of compliance with adopted performance criteria, as far as reasonably practicable.

Following the identification of appropriate mitigation and management measures, the need to offset or compensate for residual impacts was assessed.

4.4.2 Risk assessment

The risk assessment method was applied to specific matters that might be impacted by the Project where impacts could not be quantified. This includes unknown or unpredictable impacts. Potential impacts are assessed in terms of how likely they are to occur, and the consequences if they do occur.

Likelihood and consequence criteria, and the resulting risk matrix, are set out in Table 4-3, Table 4-4 and Table 4-5. These criteria have been established to be consistent with the intent of *AS ISO 31000:2018 Risk Management—Guidelines* (Standards Australia, 2018a). Risk assessments have been documented in tabular form in the relevant EIS chapters.

TABLE 4-3 LIKELIHOOD CRITERIA

Likelihood	Description	Frequency of occurrence
Almost certain	Is expected to occur in most circumstances	Once per month
Likely	Will probably occur in most circumstances	Between one a month and once a year
Possible	Might occur at some time	Between once a year and once in five years
Unlikely	Could occur at some time	Between once in 5 years and once in 20 years
Rare	May occur in exceptional circumstances	Once in more than 20 years

TABLE 4-4 CONSEQUENCE CRITERIA

Risk category		Consequence					
		Not significant	Minor	Moderate	Major	Extreme	
Safety	Impact to people	No medical treatment required	Lost-time injury or medical treatment required	Serious injury	Single fatality	Multiple, but localised, fatalities	
Assets	Engineering impacts and satisfying objectives	Up to 6 hours of track closure	>6 hours to 24 hours of track closure	>24 to 48 hours of track closure	>48 hours to 5 days of track closure	>5 days of track closure	
Financial	Total outturn cost impact	Up to 0.05% of program budget (i.e. up to \$5 m in \$10 b)	>0.05% to 0.5% of program budget (i.e. >\$5 m to \$50 m in \$10 b)	>0.5% to 1.5% of program budget (i.e. >\$50 m to \$150 m in \$10 b)	>1.5% to 5% of program budget (i.e. >\$150 m to \$500 m in \$10 b)	>5% of program budget (i.e. > \$500 m in \$10 b)	
		Up to 0.1% of Project budget (i.e. up to \$100 k in \$100 m)	>0.1% to 0.5% of Project budget (e.g. >\$100 k to \$500 k in \$100 m)	>0.5% to 2.5% of Project budget (e.g. >\$500 k to \$2.5 m in \$100 m)	>2.5% to 10% of Project budget (e.g. >\$2.5 m to \$10 m in \$100 m)	>10% of Project budget (e.g. >\$10 m in \$100 m)	
Environment	Environmental impact, heritage impact, flora and fauna, impact on archaeology and cultural heritage, pollution and amenity (public)	Contained environmental damage fully recoverable, no cost or ARTC action required	Isolated environmental damage—minimal ARTC remediation required	Localised/clustered environmental damage—requiring remediation	Considerable environmental damage—requiring remediation	Widespread long-term or permanent environmental damage—remediation required	
Regulatory	Regulatory/legislative exposure, non-compliance and 'licence to operate'	Minimal or no regulatory involvement	Notice to produce information	Improvement notice or threatened action	Prohibition notice or fines	Prosecution of the company and/or its office holders	
Reputation	Reputational exposure, customer dissatisfaction, stakeholder support, service, quality and reliability, public image and stakeholder attitudes	Isolated event able to be resolved (up to 7 days)	Management intervention required (>7 days to 3 months)	Tactical (business unit/divisional intervention required (>3 months to 18 months)	Strategic intervention required (>18 months to 3 years)	Corporate loss of shareholder and/or customer support— tangible business impact lasting >3 years	
Schedule	Time-based impacts	Influences schedule up to 1% of Program- approved schedule period	Influences schedule >1% to 2.5% of Program—approved schedule period	Influences schedule >2.5% to 5% of Program-approved schedule period	Influences schedule >5% to 10% of Program- approved schedule period	Influences schedule >10% of program- approved schedule period	
		Influences schedule up to 2% of Project- approved schedule period	Influences schedule >2% to 5% of Project- approved schedule period	Influences schedule >5% to 10% of Project- approved schedule period	Influences schedule >10% to 20% of Project- approved schedule period	Influences schedule >20% of Project- approved schedule period	

TABLE 4-5RISK MATRIX

Likelihood/consequence	Not significant	Minor	Moderate	Major	Extreme
Almost certain	Medium	Medium	High	Very high	Very high
Likely	Low	Medium	High	Very high	Very high
Possible	Low	Low	Medium	High	High
Unlikely	Low	Low	Low	Medium	Medium
Rare	Low	Low	Low	Low	Medium

4.4.3 Significance assessment

The significance assessment method was applied to specific matters that will be impacted by the Project, where those impacts cannot be quantified. The significance of a potential impact is assessed in terms of the sensitivity or vulnerability of the environmental aspect, and the magnitude of the potential impact. The sensitivity criteria, magnitude criteria, significance matrix and significance classifications applicable to this method are presented in Table 4-6, Table 4-7, Table 4-8 and Table 4-9.

TABLE 4-6 SENSITIVITY CRITERIA

Sensitivity	Description
Major	The environmental value is listed on a statutory State, national or international register as being of conservation significance
	The environmental value is entirely intact and wholly retains its intrinsic value
	The environmental value is unique to the environment in which it occurs. It is isolated to the affected system/area, which is poorly represented in the region, State, country or the world
	It has not been exposed to threatening processes, or they have not had a noticeable impact on the integrity of the environmental value
	Project activities would have an adverse effect on the value.
High	The environmental value is listed on a statutory State, national or international register as being of conservation significance
	The environmental value is intact and retains its intrinsic value
	The environmental value is unique to the environment in which it occurs. It is isolated to the affected system/area, which is poorly represented in the region
	It has not been exposed to threatening processes, or they have not had a noticeable impact on the integrity of the environmental value
	Project activities would have an adverse effect on the value.
Moderate	The environmental value is recorded as being important at a regional level, and may have been nominated for listing on recognised or statutory registers
	The environmental value is in a moderate-to-good condition despite it being exposed to threatening processes. It retains many of its intrinsic characteristics and structural elements
	It is relatively well represented in the systems/areas in which it occurs, but its abundance and distribution are exposed to threatening processes
	 Threatening processes have reduced its resilience to change. Consequently, changes resulting from Project activities may lead to degradation of the prescribed value
	Replacement of unavoidable losses is possible due to its abundance and distribution.
Low	The environmental value is not listed on any statutory register. It might be recognised locally by relevant suitably qualified experts or organisations (e.g. historical societies)
	The environmental value is in a poor-to-moderate condition as a result of threatening processes, which have degraded its intrinsic value
	It is not unique or rare and numerous representative examples exist throughout the system/area
	It is abundant and widely distributed throughout the host systems/areas
	 There is no detectable response to change, or change does not result in further degradation of the environmental value
	 The abundance and wide distribution of the environmental value ensures replacement of unavoidable losses is achieved.
Negligible	The environmental value is not listed on any statutory register, and it is not recognised locally by relevant suitably qualified experts or organisations
	It is not unique or rare and numerous representative examples exist throughout the system/area
	There is no detectable response to change, or change does not result in further degradation of the environmental value.

TABLE 4-7 MAGNITUDE CRITERIA

Magnitude	Description
Major	An impact that is widespread, permanent and results in substantial irreversible change to the environmental value. Avoidance through appropriate design responses or the implementation of environmental management controls are required to address the impact.
High	An impact that is widespread, long lasting and results in substantial and possibly irreversible change to the environmental value. Avoidance through appropriate design responses or the implementation of site-specific environmental management controls are required to address the impact.
Moderate	An impact that extends beyond the area of disturbance to the surrounding area but is contained within the region where the Project is being developed. The impacts are short-term and result in changes that can be ameliorated with specific environmental management controls.
Low	A localised impact that is temporary or short-term and either unlikely to be detectable or could be effectively mitigated through standard environmental management controls.
Negligible	An extremely localised impact that is barely discernible and is effectively mitigated through standard environmental management controls.

TABLE 4-8 SIGNIFICANCE MATRIX

Magnitude/sensitivity	Major	High	Moderate	Low	Negligible
Major	Major	Major	High	Moderate	Low
High	Major	Major	High	Moderate	Low
Moderate	High	High	Moderate	Low	Low
Low	Moderate	Moderate	Low	Negligible	Negligible
Negligible	Moderate	Low	Low	Negligible	Negligible

TABLE 4-9 SIGNIFICANCE CLASSIFICATIONS

Magnitude	Description
Major	Arises when an impact will potentially cause irreversible or widespread harm to an environmental value that is irreplaceable because of its uniqueness or rarity. Avoidance through appropriate design responses is the only effective mitigation.
High	Occurs when the proposed activities are likely to exacerbate threatening processes affecting the intrinsic characteristics and structural elements of the environmental value. While replacement of unavoidable losses is possible, avoidance through appropriate design responses is preferred to preserve its intactness or conservation status.
Moderate	Results in degradation of the environmental value due to the scale of the impact or its susceptibility to further change even though it may be reasonably resilient to change. The abundance of the environmental value ensures it is adequately represented in the region, and that replacement, if required, is achievable.
Low	Occurs where an environmental value is of local importance and temporary or transient changes will not adversely affect its viability, provided standard environmental management controls are implemented.
Negligible	Does not result in any noticeable change and the proposed activities will have negligible effect on environmental values. This typically occurs where the activities are located in already disturbed areas.

4.4.4 Cumulative impact assessment

4.4.4.1 Approach

Chapters 8 to 22 of this revised draft EIS have each undertaken a CIA for the specific matter of the Project they are assessing. These individual CIAs were collated into Chapter 23: Cumulative Impacts.

Items 6.6 and 7.3 of the ToR required that cumulative impacts of the Project be assessed but an assessment method for the CIA was not prescribed nor was there a recognised industry standard for the assessment of cumulative impacts for linear infrastructure. In the absence of a recognised industry standard, ARTC has developed an assessment approach for implementation across EISs for all Inland Rail projects. The approach used to identify and assess potential cumulative impacts is derived from previous comparable projects.

The approach used to assess potential cumulative impacts of this Project is summarised as follows:

- A review of the potential impacts identified within the EIS assessments. The status of the natural, built and social environment at the time of the revised draft EIS preparation is considered to be the baseline.
- A register of assessable projects has been collated with timelines to demonstrate the temporal relationship between projects. This included:
 - Only 'State significant' or 'strategic' projects (i.e. coordinated projects under the State Development and Public Works Organisation Act 1971 (Qld)) that are in the public domain as being planned, constructed or operated at the time of the assessment have been considered
 - Additional projects have been considered where they have been deemed to be of local significance, as occurring through consultation with community groups and stakeholders. These included:
 - Projects listed in the Goondiwindi Regional Council and Toowoomba Regional Council development application databases
 - Development within Priority Development Areas and State Development Areas
 - Economic Development Queensland development projects
 - Infrastructure Designation projects
 - Projects within the public register of environmental authorities
 - Department of Transport and Main Roads infrastructure projects
 - Private infrastructure facilities
 - Development in accordance with Regional Planning Interests.
 - The Inland Rail projects immediately adjacent to the Project, being the North Star to New South Wales (NSW)/Queensland Border and Gowrie to Helidon projects.
- Identification and mapping of the assessable projects and the area of influence of the aspect being considered. Current operational projects and commercial or agricultural operations that are in the area of influence around the Project are accounted for in the corresponding technical baseline studies (e.g. air, noise, social, economic).
- Where there is a potential overlap in impacts (either spatially or temporally), a CIA has been undertaken to determine the nature of the cumulative impact. This includes:
 - Where possible, the assessment method has been quantitative in nature; however, qualitative assessment has also been undertaken for some specific matters
 - The probability, duration, and magnitude/intensity of the impacts have been considered as well as the sensitivity of the receiving environmental conditions.
- An assessment matrix method (further detailed in Table 4-11 and Table 4-12) has been used to determine the significance of cumulative impacts with respect to beneficial or detrimental effects.
- Where cumulative impacts are deemed to be of 'medium' or 'high' significance, additional mitigation measures are proposed, beyond those already proposed by the relevant specific matter assessments.

4.4.4.2 Discipline approach to cumulative impact assessment

A summary of the assessment approach adopted by each discipline in assessing cumulative impacts for the Project is presented in Table 4-10.

TABLE 4-10	DISCIPLINE APPROACH TO	O CUMULATIVE IMPACT	ASSESSMENT
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Discipline	Assessment approach	Assessment matrix
Land use and tenure	Qualitative	Inland Rail assessment matrix (Table 4-11 and Table 4-12)
Land resources	Qualitative	Inland Rail assessment matrix (Table 4-11 and Table 4-12)
Landscape and visual amenity	Qualitative	Inland Rail assessment matrix (Table 4-11 and Table 4-12)
Flora and fauna	Quantitative	Inland Rail assessment matrix (Table 4-11 and Table 4-12)
Air quality (construction only) ¹	Qualitative	Inland Rail assessment matrix (Table 4-11 and Table 4-12)
Surface water	Qualitative	Inland Rail assessment matrix (Table 4-11 and Table 4-12)
Hydrology	Quantitative	Nil—included in assessment of Project impacts
Noise and vibration	Qualitative	Inland Rail assessment matrix (Table 4-11 and Table 4-12)
Groundwater	Qualitative	Inland Rail assessment matrix (Table 4-11 and Table 4-12)

Discipline	Assessment approach	Assessment matrix
Non-Indigenous heritage	Qualitative	Inland Rail assessment matrix (Table 4-11 and Table 4-12)
Traffic, transport and access	Qualitative	Inland Rail assessment matrix (Table 4-11 and Table 4-12)
Hazard and risk	Qualitative	Inland Rail assessment matrix (Table 4-11 and Table 4-12)
Waste management	Qualitative	Inland Rail assessment matrix (Table 4-11 and Table 4-12)
Social	Qualitative	NSW Department of Planning and Environment (NSW DP&E) Social Impact Assessment Guideline for State significant mining, petroleum production and extractive industry development and SIA Scoping Tool (2017) (Table 4-13 and Table 4-14)
Economics	Qualitative	Nil—assessed via qualitative discussion due to the potential fluidity of future economic scenarios

Table note:

1. Operations stage air quality cumulative impacts included in assessment of Project impacts (Chapter 12: Air Quality)

The following sections provide a description of the assessment matrices, as referenced in Table 4-10, that have been adopted by the various disciplines when undertaking the CIA for this revised draft EIS.

4.4.4.3 Inland Rail assessment matrix

For each discipline, the probability, duration, and magnitude/intensity of the impacts have been considered, as well as the sensitivity of the receiving environmental conditions. For each of these aspects, a relevance factor score of low, medium or high has been determined in accordance with the assessment matrix shown in Table 4-11.

For each aspect, relevance factors have been determined by using professional judgement applied by disciplinespecific teams. The sum of the relevance factors determines the impact significance, and likely management and/or monitoring requirement, which are summarised in Table 4-12.

This two-step approach is intended to provide structure to an otherwise subjective assessment, enabling the significance of potential cumulative impacts to be categorised, thus guiding the management and/or monitoring requirements for that discipline. The intent is not to replicate or replace the compliance, risk or significance assessment that is conducted for each discipline, as discussed in Sections 4.4.1 to 4.4.3.

For example, if an environmental value such as groundwater is considered to have a probability of impact of 2, duration of impact of 3, magnitude/intensity of impact of 1 and a sensitivity of receiving environment of 1, the significance of impact would be classified as Medium (2+3+1+1 = 7), for which mitigation measures and specific management practices will likely be required.

TABLE 4-11 ASSESSMENT MATRIX

Aspect	Relevance factor			
	Low	Medium	High	
Probability of impact	1	2	3	
Duration of impact	1	2	3	
Magnitude/intensity of impact	1	2	3	
Sensitivity of receiving environment	1	2	3	

TABLE 4-12 IMPACT SIGNIFICANCE

Impact significance	Sum of relevance factors	Management or monitoring requirement
Low	1–6	Negative impacts need to be managed by standard environmental management practices. Monitoring to be part of general Project monitoring program.
Medium	7–9	Mitigation measures likely to be necessary and specific management practices to be applied. Targeted monitoring program required, where appropriate.
High	10–12	Alternative actions should be considered and/or mitigation measures applied to demonstrate improvement. Targeted monitoring program required, where appropriate.

Full details of the CIA, including projects considered as part of the assessment, are presented in Chapter 23: Cumulative Impacts.

4.4.4.4 NSW Social Impact Guidelines assessment matrix

The Queensland *Social Impact Assessment Guideline* (Department of State Development, Infrastructure, Local Government and Planning, 2018) does not include a significance or risk assessment matrix, so the social risk matrix from the NSW *Social Impact Assessment Guideline for State significant mining, petroleum production and extractive industry development* (NSW DP&E, 2017) as shown in Table 4-13 has been applied in the assessment of cumulative social impacts.

The likelihood of social impacts and opportunities occurring has been assessed with reference to the social baseline (e.g. findings regarding community vulnerabilities), stakeholder inputs and revised draft EIS technical findings.

'Consequence', as defined in Table 4-14, has been assessed based on how the social impact may be experienced by the relevant stakeholders, considering the:

- > Duration of impacts and benefits, being either short-term (during construction) or long-term (during operation)
- > Sensitivity, including specific vulnerabilities and resilience to impacts
- > Severity of potential effects on stakeholders and magnitude of potential benefits.

TABLE 4-13 RISK ASSESSMENT RATINGS, NSW DP&E SOCIAL IMPACT ASSESSMENT GUIDELINES

Likelihood		Consequence levels				
		1 Minimal	2 Minor	3 Moderate	4 Major	5 Catastrophic
А	Almost certain	A1 (High)	A2 (High)	A3 (Extreme)	A4 (Extreme)	A5 (Extreme)
В	Likely	B1 (Moderate)	B2 (High)	B3 (High)	B4 (Extreme)	B5 (Extreme)
С	Possible	C1 (Low)	C2 (Moderate)	C3 (High)	C4 (Extreme)	C5 (Extreme)
D	Unlikely	D1 (Low)	D2 (Low)	D3 (Moderate)	D4 (High)	D5 (High)
Е	Rare	E1 (Low)	E2 (Low)	E3 (Moderate)	E4 (High)	E5 (High)

Source: NSW DP&E 2017.

TABLE 4-14 CONSEQUENCE DEFINITIONS

Rating	Impact (-)	Benefit (+)
Minimal	Local, small-scale, easily reversible change on social characteristics, or the values of the community of interest or communities can easily adapt or cope with change	Local small-scale opportunities emanating from the Project that the community can readily pursue and capitalise on
Minor	Short-term recoverable changes to social characteristics and values of the communities of interest, or the community has substantial capacity to adapt and cope with change	Short-term opportunities emanating from the Project
Moderate	Medium-term recoverable changes to social characteristics and values of the communities of interest, or the community has some capacity to adapt and cope with change	Medium-term opportunities emanating from the Project
Major	Long-term recoverable changes to social characteristics and values of the communities of interest, or the community has limited capacity to adapt and cope with change	Long-term opportunities emanating from the Project
Catastrophic	Irreversible changes to social characteristics and values of the communities of interest, or the community has no capacity to adapt and cope with change	N/A

Source: Adapted from the Queensland Social Impact Assessment Guideline (Department of State Development, Infrastructure, Local Government and Planning, 2018).

4.5 Mitigation and management measures

Mitigation and management measures are designed to protect specific matters and sensitive receptors, achieve established performance objectives, and enhance positive impacts as a result of the Project. Initial and additional mitigation and management measures have been incorporated into all three assessment methods, as summarised in Figure 4-2.



FIGURE 4-2 PROCESS FOR THE ASSESSMENT OF IMPACTS AND THE STAGED APPLICATION OF MITIGATION MEASURES

Initial mitigation measures are the controls incorporated into the planning and revised reference design stages of the Project to avoid or minimise potential impacts. Additional mitigation and management measures are proposed to further avoid or minimise impacts through future Project stages, being:

- Detailed design
- Pre-construction stage and early works
- Construction works
- Commissioning
- Operations.

In some instances, significant residual impacts are anticipated after the application of additional mitigation and management measures. In these cases, the need to offset or compensate for significant adverse residual impacts has been assessed.

Mitigation and management measures (initial and additional) have been documented in tabular form in the relevant revised draft EIS chapters.

4.6 Draft Outline Environmental Management Plan

Chapter 24: Draft Outline Environmental Management Plan (Draft Outline EMP) identifies the specific matters potentially affected by the Project, and establishes a framework for continuous management, monitoring, reporting and training. The Draft Outline EMP provides a consolidation of mitigation and management across all aspects assessed in the revised draft EIS.

The Draft Outline EMP has been prepared to establish the minimum requirements of environmental management plans for future stages of the Project.