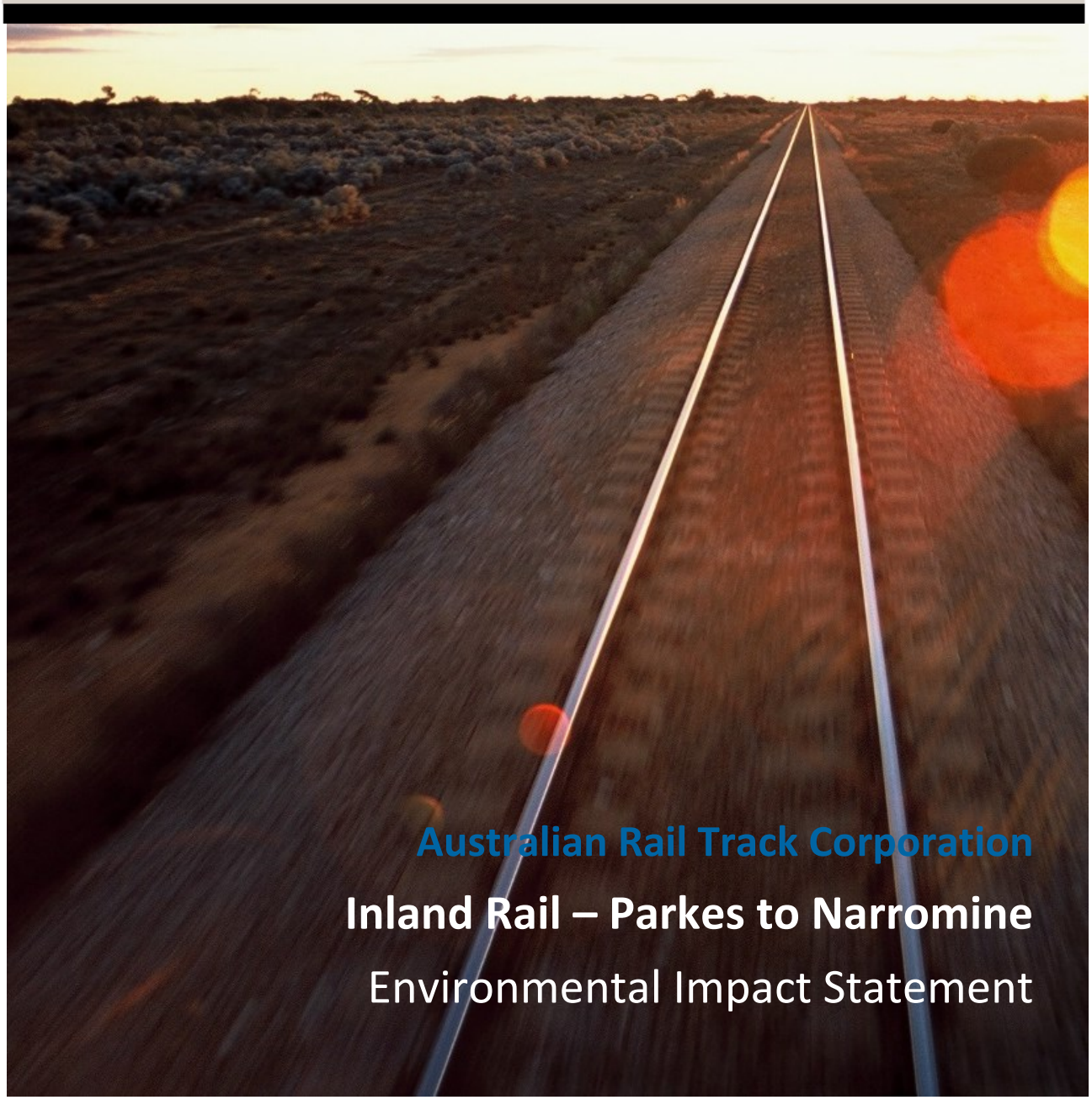
Parkes to Narromine Project Environmental Impact Statement

Main Report

The Australian Government's priority freight rail project



Australian Rail Track Corporation

Inland Rail – Parkes to Narromine

Environmental Impact Statement

Volume 1

Main report – Part A

Volume 1 – Main Report

Table of contents

Part A Introduction

1. Introduction 1-1
   - 1.1 Inland Rail 1-1
   - 1.2 The proposal 1-1
   - 1.3 Objectives of the proposal and Inland Rail 1-5
   - 1.4 EIS purpose and structure 1-5
2. General biophysical and cultural environment 2-1
   - 2.1 Regional setting 2-1
   - 2.2 Description of the proposal site 2-1
   - 2.3 General biophysical environment of the proposal site 2-9
   - 2.4 General cultural environment of the proposal site 2-10
   - 2.5 Existing rail facilities and operations 2-12
3. Statutory context 3-1
   - 3.1 Overview of the approval pathway 3-1
   - 3.2 Environmental Planning and Assessment Act 1979 3-1
   - 3.3 NSW environmental planning instruments 3-3
   - 3.4 Other NSW legislative requirements 3-4
   - 3.5 Commonwealth requirements 3-6
   - 3.6 Summary of approval and notification requirements 3-7
   - 3.7 Summary of the assessment process 3-7
4. Consultation 4-1
   - 4.1 Consultation approach, objectives and strategy 4-1
   - 4.2 Consultation process and activities 4-2
   - 4.3 Results of consultation relevant to the EIS 4-4
   - 4.4 Consultation during exhibition of the EIS 4-5
   - 4.5 Consultation during design and delivery of the proposal 4-6

Part B Proposal

5. Strategic context and need for the proposal 5-1
   - 5.1 Strategic planning context 5-1
   - 5.2 Summary of key issues and demands 5-4
   - 5.3 Need for the proposal 5-6
6. Alternatives and proposal options 6-1
   - 6.1 Inland Rail alternatives 6-1
   - 6.2 Proposal option development 6-6
   - 6.3 Options considered for proposal features 6-7

7. Proposal features and operation 7-1
7.1 Overview 7-1
7.2 Description of key proposal features within the existing rail corridor 7-3
7.3 Description of key proposal features outside the existing rail corridor 7-9
7.4 Ancillary works and infrastructure 7-12
7.5 Land acquisition 7-14
7.6 Operation of the proposal 7-15
8. Construction of the proposal 8-1
8.1 Overview of construction scope and approach 8-1
8.2 Indicative construction methodology 8-1
8.3 Timing, staging and working hours 8-15
8.4 Construction compounds 8-13
8.5 Construction resources 8-14
8.6 Transport, access and haulage arrangements 8-16
8.7 Public utilities 8-19
Part C Environmental Impact Assessment
9. Traffic, transport and access 9-1
9.1 Assessment approach 9-1
9.2 Existing environment 9-2
9.3 Impact assessment 9-10
9.4 Mitigation and management 9-15
10. Biodiversity 10-1
10.1 Assessment approach 10-1
10.2 Existing environment 10-3
10.3 Impact assessment 10-18
10.4 Mitigation and management 10-28
11. Noise and vibration (amenity impacts) 11-1
11.1 Assessment approach 11-1
11.2 Noise and vibration management levels/criteria - amenity 11-4
11.3 Existing environment 11-8
11.4 Impact assessment 11-15
11.5 Mitigation and management 11-21
12. Vibration (structural) impacts 12-1
12.1 Assessment approach 12-1
12.2 Vibration management criteria 12-2
12.3 Existing environment 12-3
12.4 Impact assessment 12-3
12.5 Mitigation and management 12-5

13. Air quality 13-1
13.1 Assessment approach 13-1
13.2 Existing environment 13-2
13.3 Assessment criteria 13-4
13.4 Impact assessment 13-5
13.5 Mitigation and management 13-13
14. Soils and contamination 14-1
14.1 Assessment approach 14-1
14.2 Existing environment 14-2
14.3 Impact assessment 14-11
14.4 Mitigation and management 14-13
15. Hydrology and flooding 15-1
15.1 Assessment approach 15-1
15.2 Existing environment 15-3
15.3 Impact assessment 15-13
15.4 Mitigation and management 15-29
16. Water quality 16.1
16.1 Assessment approach 16.1
16.2 Existing environment 16.2
16.3 Impact assessment 16.4
16.4 Mitigation and management 16.9
17. Aboriginal heritage 17-1
17.1 Assessment approach 17-1
17.2 Existing environment 17-3
17.3 Impact assessment 17-6
17.4 Mitigation and management 17-7
18. Non-Aboriginal heritage 18-1
18.1 Assessment approach 18-1
18.2 Existing environment 18-2
18.3 Impact assessment 18-9
18.4 Mitigation and management 18-11
19. Landscape and visual 19-1
19.1 Assessment approach 19-1
19.2 Existing environment 19-2
19.3 Impact assessment 19-7
19.4 Mitigation and management 19-12

20. Land use and property 20-1
20.1 Assessment approach 20-1
20.2 Existing environment 20-2
20.3 Impact assessment 20-24
20.4 Mitigation and management 20-35
21. Socio-economic assessment 21-1
21.1 Assessment approach 21-1
21.2 Existing environment 21-2
21.3 Impact assessment 21-4
21.4 Mitigation and management 21-8
22. Sustainability 22-1
22.1 Assessment approach 22-1
22.2 Assessment results 22-4
22.3 Mitigation and management 22-10
23. Climate change risk 23-1
23.1 Assessment approach 23-1
23.2 Assessment results 23-2
23.3 Mitigation and management 23-3
24. Waste 24-1
24.1 Assessment approach 24-1
24.2 Impact assessment 24-2
24.3 Mitigation and management 24-9
25. Health and safety (including hazardous materials) 25-1
25.1 Assessment approach 25-1
25.2 Existing environment 25-2
25.3 Impact assessment 25-3
25.4 Mitigation and management 25-7
26. Cumulative and residual impacts 26-1
26.1 Overview 26-1
26.2 Cumulative impact assessment 26-1
26.3 Residual Impacts 26-9
Part D EIS synthesis and conclusion
27. Approach to environmental management and mitigation 27-1
27.1 Compilation of impacts 27-1
27.2 Approach to environmental management 27-5
27.3 Compilation of mitigation measures 27-7
27.4 Compilation of performance outcomes 27-19

28. Conclusion 28-1
28.1 Summary description of the proposal for which approval is sought 28-1
28.2 Proposal uncertainties 28-2
28.3 Justification of the proposal 28-3
28.4 Concluding statement 28-7
29. Reference list 29-1

Table index

Table 4.1 Consultation tools 4-2
Table 4.2 Summary of issues raised relating to the EIS 4-4
Table 6.1 Summary of preferred option for level crossings 6-9
Table 8.1 Construction staging for work in the existing rail corridor 8-12
Table 8.2 Indicative construction plant and equipment 8-15
Table 8.3 Potential construction access routes to work areas 8-16
Table 8.4 Vehicle movements for each stage of construction 8-18
Table 9.1 Local roads crossing the proposal site 9-5
Table 9.2 Roads located close to the proposal site 9-6
Table 9.3 Key intersections located near the proposal site 9-7
Table 9.4 Indicative maximum one way vehicle volumes for level of service bands 9-9
Table 9.5 Crash history 2009-2013 9-9
Table 9.6 Level crossing delays per train 9-14
Table 9.7 Summary of mitigation measures 9-16
Table 10.1 Plant communities 10.4
Table 10.2 Key fish habitat 10-18
Table 10.3 Estimated area of each plant community type that would be impacted 10-20
Table 10.4 Credits required for offsetting impacts 10-24
Table 10.5 Summary of the offset requirement for relevant matters of national environmental significance 10-25
Table 10.6 Proposal biodiversity offset strategy tasks 10-29
Table 10.7 Biodiversity mitigation measures 10-30
Table 11.1 Construction noise management levels 11-5
Table 11.2 Construction road traffic noise criteria (residential land uses) 11-5
Table 11.3 Rail traffic noise criteria – residential land uses 11-6
Table 11.4 Rail traffic noise criteria – non-residential land uses 11-6
Table 11.5 Acceptable vibration values for intermittent vibration 11-7

Table 11.6 Guidance on the effects of vibration levels 11-8
Table 11.7 Construction activity noise management level exceedances 11-16
Table 11.8 Predicted vibration levels from construction equipment 11-18
Table 11.9 Vibration safe working buffer distances 11-19
Table 11.10 Estimated distance from train horn to achieve the RING L_{Amax} trigger value 11-20
Table 11.11 Potential operational noise mitigation options 11-23
Table 11.12 Summary of mitigation measures 11-24
Table 12.1 Guideline values for short term vibration on structures 12-2
Table 12.2 Vibration safe working distances 12-4
Table 12.3 Summary of mitigation measures 12-5
Table 13.1 Adopted air quality impact assessment criteria 13-4
Table 13.2 Estimated emissions of PM_{10} during construction 13-6
Table 13.3 Air quality mitigation measures 13-14
Table 14.1 Summary of subsurface conditions 14-3
Table 14.2 Summary of mitigation measures 14-14
Table 15.1 Watercourses crossing the proposal site 15-6
Table 15.2 Summary of overtopping in flood events 15-7
Table 15.3 Summary of compliance with ARTC requirements 15-9
Table 15.4 Level crossing overtopping 15-9
Table 15.5 Road overtopping – existing situation 15-10
Table 15.6 Areas of upstream flooding – existing rail corridor 15-10
Table 15.7 Road overtopping 15-19
Table 15.8 Areas of upstream flooding 15-27
Table 15.9 Hydrology and flooding mitigation measures 15-29
Table 16.1 Existing water quality data 16.2
Table 16.2 Trigger values for water quality parameters 16.3
Table 16.3 Water quality mitigation measures 16.9
Table 17.1 Assessment of archaeological significance for areas of moderate or high archaeological potential 17-5
Table 17.2 Aboriginal heritage mitigation measures 17-8
Table 18.1 Heritage listed items within one kilometre of the proposal site 18-5
Table 18.2 Non-Aboriginal heritage mitigation measures 18-11
Table 19.1 Landscape character zones 19-4
Table 19.2 Summary of landscape character impact ratings 19-9

Table 19.3 Landscape and visual mitigation measures 19-12
Table 20.1 Land use by LGA 20-2
Table 20.2 Major crops grown 20-15
Table 20.3 Livestock numbers 20-15
Table 20.4 Land and soil capability 20-16
Table 20.5 Mining leases in the study area 20-23
Table 20.6 Potential property impacts during construction 20-26
Table 20.7 Land use impact by flood extents under existing and design conditions 20-28
Table 20.8 Land use and property mitigation measures 20-35
Table 21.1 Socio-economic mitigation measures 21-8
Table 22.1 Proposal sustainability objectives, outcomes and potential initiatives 22-5
Table 22.2 Sustainability mitigation measures 22-10
Table 23.1 Climate change mitigation measures 23-4
Table 24.1 Waste estimates and classification - construction 24-4
Table 24.2 Preliminary estimate of potential spoil generation 24-6
Table 24.3 Spoil management hierarchy for the proposal 24-7
Table 24.4 Waste estimates and classification - operation 24-8
Table 24.5 Waste mitigation measures 24-9
Table 24.6 Construction waste management measures 24-10
Table 24.7 Colour-coding scheme for waste segregation bins 24-13
Table 24.8 Operation waste management measures 24-13
Table 25.1 Dangerous goods volumes and thresholds 25-4
Table 25.2 Health and safety mitigation measures 25-8
Table 26.1 Existing or proposed projects 26-2
Table 26.2 Cumulative impacts – other issues 26-9
Table 26.3 Residual impact assessment 26-9
Table 27.1 Summary of key potential construction impacts 27-1
Table 27.2 Summary of key potential operation impacts 27-3
Table 27.3 Compilation of proposal specific mitigation measures for detailed design/pre-construction 27-7
Table 27.4 Compilation of proposal specific mitigation measures for construction 27-13
Table 27.5 Compilation of proposal specific mitigation measures for operation 27-17
Table 27.6 Compilation of environmental performance outcomes 27-19
Table 28.1 Proposal uncertainties 28-2

Figure index

Figure 1.1 Location of the proposal 1-2
Figure 1.2 Key features of the proposal 1-4
Figure 2.1 Regional context 2-2
Figure 2.2 Proposal site 2-3
Figure 2.3 Existing rail lines in the study area 2-13
Figure 5.1 Proposed alignment for Inland Rail 5-2
Figure 6.1 Parkes north west connection options 6-11
Figure 6.2 Brolgan Road overbridge options 6-13
Figure 7.1 Approach to avoiding and minimising impacts during the design process 7-2
Figure 7.2 Track reconstruction 7-3
Figure 7.3 Skim reconditioning 7-4
Figure 7.4 Skim plus reconditioning 7-4
Figure 7.5 Indicative crossing loop 7-5
Figure 7.6 Goonumbla crossing loop 7-6
Figure 7.7 Peak Hill crossing loop 7-7
Figure 7.8 Timjelly crossing loop 7-8
Figure 7.9 Parkes north west connection 7-10
Figure 7.10 Parkes north west connection – typical section 7-11
Figure 7.11 Parkes north west connection – section in cut 7-11
Figure 7.12 Brolgan Road overbridge 7-13
Figure 7.13 Indicative spoil mound cross-section 7-14
Figure 7.14 Projected growth in train numbers for Inland Rail 7-15
Figure 8.1 Indicative construction program 8-5
Figure 8.2 Construction work stages, work areas and compounds 8-6
Figure 9.1 Road network 9-3
Figure 10.1 Vegetation communities 10-9
Figure 11.1 Noise and vibration monitoring locations 11-2
Figure 11.2 Sensitive receiver locations 11-9
Figure 13.1 Five year wind rose for Parkes Airport 13-3
Figure 13.2 Air quality sensitive receiver locations 13-7
Figure 14.1 Soils and contamination 14-4
Figure 15.1 River basins and watercourses 15-4
Figure 15.2 Predicted rail overtopping locations 15-8

Figure 15.3 Existing flooding extents 15-11
Figure 15.4 Rail overtopping during operation 15-18
Figure 15.5 Public roads impacted by floodwater during a one per cent AEP event 15-20
Figure 15.6 Change in flood extents for the proposal 15-21
Figure 18.1 Heritage item 18-4
Figure 19.1 Impact significance rating matrix 19-2
Figure 19.2 Landscape character zones 19-6
Figure 20.1 Land use zoning 20-3
Figure 20.2 Specific land uses 20-9
Figure 20.3 Land and soil capability 20-17
Figure 20.4 Changes in flood extents – land uses 20-24
Figure 26.1 Projects in the study area 26-3

Plate index

Plate 18.1 Goobang Junction underbridge 18-6
Plate 18.2 Goonumbla underbridge 18-6
Plate 18.3 Grain rail sidings and silos at Tomingley West 18-7
Plate 18.4 Grain rail sidings and silos at Wyanga 18-7
Plate 18.5 Derelict cottage at Wyanga 18-8
Plate 19.1 Existing rail track 19-3
Plate 19.2 Indicative view of location for the Parkes north west connection 19-4
Plate 19.3 Example of a double stacked train 19-8
Plate 19.4 Example of similar infrastructure to the Parkes north west connection and the Brolgan Road overbridge – a new section of rail line with road overbridge 19-10
Plate 19.5 Example of similar infrastructure to the Brolgan Road overbridge – road overbridge pavement view 19-10
Plate 19.6 Example of similar infrastructure to the Parkes north west connection and the Brolgan Road overbridge – road overbridge side view 19-11

Appendices to volume 1

Appendix A Secretary's environmental assessment requirements and summary of agency requirements
Appendix B Environmental risk assessment report
Appendix C Environmental Planning and Assessment Regulation 2000 checklist
Appendix D Parkes to Narromine Consultation Report
Appendix E Consistency with relevant strategic plans
Appendix F Air quality data
Appendix G Preliminary land acquisition details
Appendix H Inland Rail NSW Construction Noise and Vibration Management Framework
Appendix I Sustainability assessment results
Appendix J Climate change risk assessment
Appendix K Construction Environmental Management Plan outline
Appendix L Inland Rail – Parkes to Narromine Biodiversity Offset Strategy (Phase 1)
Appendix M Inland Rail Noise and Vibration Management Strategy

Volumes 2 to 6 – Technical reports

The following technical reports informed the preparation of the EIS. These reports are available in volumes 2 to 6.

Volume 2

Technical Report 1 – Traffic, transport and access assessment

Technical Report 2 – Biodiversity assessment report

Technical Report 3 – Aquatic ecology assessment

Technical Report 4 – Commonwealth matters assessment

Volume 3

Technical Report 5 – Noise and vibration assessment

Volume 4

Technical Report 6 – Hydrology and flooding assessment

Technical Report 7 – Water quality assessment

Volume 5

Technical Report 8 – Aboriginal cultural cultural heritage and archaeological assessment

Technical Report 9 – Non-Aboriginal heritage impact statement

Volume 6

Technical Report 10 – Landscape and visual assessment

Technical Report 11 – Socio-economic assessment

Certification

Submission of environmental impact statement

Prepared under Part 5.1 of the Environmental Planning and Assessment Act 1979 (NSW).

Environmental impact statement prepared by:

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Qualifications	Bachelor of Science (Honours) Master of Urban and Regional Planning	Bachelor of Science (Honours)
Address	GHD Pty Ltd 133 Castlereagh Street, Sydney NSW 2000	
Responsible person name and address **(proponent)**	Simon Thomas Programme Director Inland Rail Australian Rail Track Corporation Level 12, 40 Creek Street Brisbane QLD 4000	
The address of the land to which the statement relates	Land within the Parkes and Narromine local government areas as described within this environmental impact statement.	
Description of the infrastructure to which this statement relates	Construction and operation of a section of Inland Rail, located between Parkes and Narromine in NSW.	
Environmental impact statement	An environmental impact statement is attached addressing all matters in accordance with Part 5.1 of the Environmental Planning and Assessment Act 1979 (NSW) and Schedule 2 of the Environmental Planning and Assessment Regulation 2000 (NSW).	
Declaration	I certify that I have prepared this environmental impact statement in accordance with the Secretary's Environmental Assessment Requirements dated 8 November 2016. The environmental impact statement contains all available information that is relevant to the environmental assessment of the infrastructure to which the statement relates. To the best of my knowledge, the information contained in the environmental impact statement is neither false nor misleading.	
Signatures		
Name	Amanda Raleigh	Aryel Pyliotis
Date	22.06.2017	22.06.2017

Abbreviations

Abbreviation	Definition
ABS	Australian Bureau of Statistics
ACM	asbestos containing material
AEP	annual exceedance probability
AGO	Australian Greenhouse Office
AHD	Australian height datum
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal heritage impact permit
ANZS	Standards Australia and New Zealand
ARI	average recurrence interval
AS	Australian Standard
BoM	Bureau of Meteorology
CEEC	critically endangered ecological community
CEMP	construction environmental management plan
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DECC	Department of Environment and Climate Change
DECCW	Department of Environment, Climate Change and Water
DPI	Department of Primary Industries
EEC	endangered ecological community
EIS	environmental impact statement
EPA	Environment Protection Authority
EP&A Act	Environmental Planning and Assessment Act 1979
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)
EPL	environment protection licence
ESD	ecologically sustainable development
FM Act	Fisheries Management Act 1994
GHD	GHD Pty Ltd
Infrastructure SEPP	State Environmental Planning Policy (Infrastructure) 2007

Abbreviation	Definition
IS	infrastructure sustainability
ISCA	Infrastructure Sustainability Council Australia
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organisation for Standardisation
km	kilometres
km^2	square kilometres
km/h	kilometres per hour
LGA	local government area
LALC	Local Aboriginal Land Council
m	metres
mAHD	metres above Australian height datum
NCA	noise catchment area
NEPC	National Environmental Protection Council
NEPM	National Environmental Protection Measure
NPW Act	National Parks and Wildlife Act 1974
OEH	Office of Environment and Heritage
OEMP	operation environmental management plan
PMF	probable maximum flood
POEO Act	Protection of the Environment Operations Act 1974
RBL	rating background level
the Regulation	Environmental Planning and Assessment Regulation 2000
RING	Rail Infrastructure Noise Guideline (EPA, 2013)
SEARs	Secretary's Environmental Assessment Requirements (for the EIS)
SEPP	state environmental planning policy
TEC	threatened ecological community
TSC Act	Threatened Species Conservation Act 1995
TSS	total suspended solids
WARR Act	Waste and Resource Recovery Act 2001

Definitions

Term	Definition
Aboriginal object	Defined by the *National Parks and Wildlife Act 1974* as: 'any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains'.
Aboriginal site	A place where physical remains or modification of the natural environment indicate past and 'traditional' activities by Aboriginal people. Site types include artefact scatters, isolated artefacts, burials, shell middens, scarred trees, quarries and contact sites. Includes sites listed on the. Also known as Aboriginal objects.
Aboriginal place	Declared by the Minister for the Environment, in accordance with Section 84 of the National Parks and Wildlife Act 1974 and by an order published in the Gazette, as a place that, in the opinion of the Minister, is or was of special significance with respect to Aboriginal culture.
Aboriginal places of heritage significance	Defined in the Standard Instrument - Principal Local Environmental Plan as an area of land, the general location of which is identified in an Aboriginal heritage study adopted by the Council, and that may be shown on the Heritage Map. The term may include (but is not limited to) places that are declared as Aboriginal places under section 84 of the National Parks and Wildlife Act 1974.
Absorptive capability	Absorptive capability relates to the ability of the landscape character zones to absorb the proposal within the existing landscape setting
Active control (level crossings)	Where the movement of vehicular or pedestrian traffic across a railway crossing is controlled using devices such as flashing signals, gates or barriers (or a combination of these), with the device/s activated prior to, and during, the passage of a train through the crossing
Annual exceedance probability (AEP)	The chance of a flood if a nominated size occurring in a particular year. The chance of the flood occurring is expressed as a percentage and, for large floods, is the reciprocal of the ARI. For example, the 1 per cent AEP flood event is equivalent to the 100 year ARI flood event
Approved methods	*Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (DEC, 2005)*
Average recurrence interval (ARI)	The long term average number of years between the occurrence of a flood of a nominated size
Ballast	Crushed rock, stone etc used to provide a foundation for a railway track. Ballast usually provides the bed on which railway sleepers are laid, transmits the load from train movements, and restrains the track from movement
Biobanking agreement	Landowners enter into a biobanking agreement with the Minister for the Environment to establish a biobank site. A biobanking agreement is a conservation covenant that is attached to the land title. A biobanking agreement specifies the management actions that are required to be undertaken on biobank sites to improve biodiversity values and allow biodiversity credits to be created.
Biobank site	A site to which a biobanking agreement applies

Term	Definition
Biodiversity credits	In accordance with the *Framework for Biodiversity Assessment* (OEH, 2014b) the biodiversity credits, which consist of ecosystem credits and species credits, represent the impacts on threatened species as a result of a proposal. A decision support tool, produced by OEH, is used to determine the number of biodiversity credits required to offset the impacts of the development.
Biodiversity offsets	Biodiversity offsets are measures that benefit biodiversity by compensating for the adverse impacts elsewhere of an action, such as clearing for development. Biodiversity offsets work by protecting and managing biodiversity values in one area in exchange for impacts on biodiversity values in another.
Biophysical environment	The physical environment (water, soil etc) as well as the biological activity within it (plants, animals etc)
Bulk freight	Bulk freight generally involves large quantities of homogenous product, typically liquid or loose crushed solid material (such as cement, grains and ores), transported on mass without packaging
Classified road	A road that meets the definition of a classified road and is listed as such under the Roads Act 1993 – includes main roads, highways, freeways etc
Climate	The average weather experienced at a site or region over a period of many years, ranging from months to many thousands of years. The relevant measured quantities are most often surface variables such as temperature, rainfall and wind.
Climate scenario	A plausible and often simplified representation of the future climate, based on an internally consistent set of climatological relationships that has been constructed for explicit use in investigating the potential consequences of anthropogenic climate change, often serving as input to impact models
Construction compound	An area used as the base for construction activities, usually for the storage of plant, equipment and materials and/or construction site offices and worker facilities
Crossing loop	A section of track off to the side of the main track/s that allows a train to move to the side so that another train can pass
Culvert	A structure that allows water to flow under a road, railway, track, or similar obstruction
Dangerous goods	Dangerous goods are substances or articles that pose a risk to people, property or the environment, due to their chemical or physical properties. They are usually classified with reference to their immediate risk.
Ecologically sustainable development	Development that uses, conserves and enhances the resources of the community so that ecological processes on which life depends are maintained, and the total quality of life, now and in the future, can be increased
Ecosystem credit	A measurement of the value of EECs, CEECs and threatened species habitat for species that can be reliably predicted to occur with a plant community type. Ecosystem credits measure the loss in biodiversity values as a result of a proposal, and the gain in biodiversity values at an offset site.
Emission	A substance discharged into the air

Term	Definition
Existing rail corridor	The corridor within which existing rail infrastructure, subject to works as part of Inland Rail, are located. The existing rail corridor is defined by ARTC to mean everywhere within 15 metres of the outermost rails; or within the boundary fence where boundary fences are provided and are closer than 15 metres; or if the property boundary is less than 15 metres, the property boundary; or a permanent structure such as a fence, wall or level crossing separating the operating rail corridor from other land.
Formation	The earthworks/material on which the ballast, sleepers and tracks are laid
Freight	Goods transported by truck, train, ship, or aircraft
Freight task	The amount of freight transport, usually measured in tonnes or tonne-kilometres
Heritage listed	An item, building or place included on statutory heritage lists maintained by local, State and/or the Australian Government
Infrastructure sustainability	Infrastructure that is designed, constructed and operated to optimise environmental, social and economic outcomes of the long term
Inland Rail programme (Inland Rail)	The Inland Rail programme encompasses the design and construction of a new inland rail connection between Melbourne and Brisbane, via Wagga, Parkes, Moree, and Toowoomba. The route for Inland Rail is about 1,700 km in length. Inland Rail will involve a combination of upgrades of existing rail track and the provision of new track.
Intermodal	The movement of freight using multiple modes of transport (rail, ship, truck) without handling of the freight itself when changing modes. For a railway this usually refers to the transport of freight in containers which may be double stacked on the wagons carrying them.
$L_{A90(period)}$	The sound pressure level exceeded for 90 per cent of the measurement period
$L_{Aeq(time)}$	Typically used to described ambient (background) noise levels
$L_{Aeq(1\ hour)}$	The busiest 1-hour ‘equivalent continuous noise level’ – it represents the typical LAeq noise level from all the proposal noise events during the busiest 1-hour of the assessment period
$L_{Aeq(9\ hour)}$	The night-time ‘equivalent continuous noise level’ - it represents the cumulative effects of all the proposal noise events occurring in the night-time period from 10pm to 7am
$L_{Aeq(15\ hour)}$	The daytime ‘equivalent continuous noise level’ - it represents the cumulative effects of all the proposal noise events occurring in the daytime period from 7am to 10pm
$L_{Aeq(24\ hour)}$	The ‘equivalent continuous noise level’, sometimes also described as the ‘energy-averaged noise level’ – it represents the cumulative effects of all the proposal noise events occurring in one day
L_{Amax}	The maximum sound level recorded during the measurement period.
Landscape	All aspects of a tract of land, including landform, vegetation, buildings, villages, towns, cities and infrastructure
Landscape character	The combined quality of built, natural and cultural aspects that make up an area and provide its unique sense of place
Landscape character zone	An area of landscape with similar properties or strongly defined spatial qualities, distinct from areas immediately adjacent

Term	Definition
Landscape feature	A component, part or feature of the landscape that is prominent or eye-catching, e.g. hills, buildings, vegetation
Landscape quality	Largely subjective judgement based on particular characteristics that influence the way in which the environment is experienced, including special interests such as cultural associations or heritage interests, the presence and/or type of elements and condition.
Level crossing	A place where rail lines and a road cross at the same elevation
Level crossing protection	The level of control provided at level crossings, which is determined on a case by case basis, and depends on the particular characteristics of a crossing. It generally falls into two categories: passive protection (uses warning signage only) or active protection (uses either signage and flashing lights only, or signage/flashing lights with boom gates)
Level of service	Defined by Austroads as a measure for ranking operating road and intersection conditions, based on factors such as speed, travel time, freedom to manoeuvre, interruptions, comfort and convenience
Local road	Road used primarily to access properties located along the road
Non-bulk freight	Non-bulk freight is generally characterised as any containerised, packaged or other unitised freight, such as: pallets; motor vehicles and trailers; laden transported vehicles and live animals. It is generally placed or lifted onto or into transport vehicles or holds. It often involves heterogeneous goods being moved between dispersed locations. Non-bulk freight varies in density, perishability and fragility.
Passive control (level crossings)	Where the movement of vehicular or pedestrian traffic across a railway crossing is controlled using signs or devices that are not activated by the approach or passage of a train, relying on the road user to detect the approach or presence of a train by direct observation
PM_{10}	Particulate matter 10 micrometres or less in diameter. Particles in this size range make up a large proportion of dust that can be drawn deep into the lungs. This is a classification of particles by size rather than chemical properties.
Possession	A period of time during which a rail line is blocked to trains to permit work to be carried out on or near the line
Proposal	The construction and operation of the Parkes to Narromine section of Inland Rail
Proposal site	The area that would be directly affected by construction works (also known as the construction footprint). It includes the location of proposal infrastructure, the area that would be directly disturbed by the movement of construction plant and machinery, and the location of the storage areas/compounds sites etc, that would be used to construct that infrastructure.
Pioneer line	Rail lines constructed to a lesser standard than main rail lines, providing access to mainly agricultural areas
Rail alignment	The exact positioning of the track, accurately defined both horizontally and vertically, along which the rail vehicles operate
Rail corridor	The corridor within which the rail tracks and associated infrastructure are located

Term	Definition
Rail level	The theoretical level of the running surface of the rails
Rating background level	The underlying level of noise present in an area once transient and short-term noise events are filtered out
Relic	A relic is defined by the NSW *Heritage Act 1977* as 'any artefact, object or material evidence which relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and which is of State or local heritage significance.'
Sensitivity	The sensitivity of a landscape character area or view and its capacity to absorb change. In the case of visual impact this also relates to the type of viewer and number of viewers
Species credit	The class of biodiversity credits created or required for the impact on threatened species that cannot be reliably predicted to use an area of land based on habitat surrogates. Species that require species credits are listed in the threatened species profile database.
Spoil	Material generated by construction
Strahler stream order	Classification system that gives a waterway an ‘order’ according to the number of tributaries associated with it
Section 170 register	Under section 170 of the *Heritage Act 1977*, all state government agencies must keep and administer a database of heritage assets called a Section 170 Heritage and Conservation Register
Sensitive receivers	Land uses which are sensitive to potential noise, air and visual impacts, such as residential dwellings, schools and hospitals
Study area	The study area is defined as the wider area including and surrounding the proposal site, with the potential to be directly or indirectly affected by the proposal (for example, by noise and vibration, visual or traffic impacts). The actual size and extent of the study area varies according the nature and requirements of each impact assessment technical report.
Super T girder	A concrete bridge girder that is fully pretensioned, prestressed, and precast, and which incorporates the structural function of a box girder with permanent formwork in the deck
Track	The structure consisting of the rails, fasteners, sleepers and ballast, which sits on the formation
Track formation	Refer to the definition of formation
Travelling stock routes	Travelling stock routes and reserves are parcels of Crown land reserved under the Crowns Lands Act 1989 for use by travelling stock
Turnout	A junction point where a rail vehicle can leave a given track for a branching or parallel track
Visual amenity	The value of a particular area or view in terms of what is seen
Visual impact	The impacts on the views from residences, workplaces and public places. This can be positive (i.e. benefit or an improvement) or negative (i.e. adverse or a detraction)
Visual catchment	Extent of potential visibility to or from a specific area, feature or proposal
View	The visual experience from the viewer’s perspective

Term	Definition
Waste	Waste is defined by the EPA as any matter (whether liquid, solid, gaseous or radioactive) that is discharged, emitted or deposited in the environment in such volume, constituency, or manner as to cause an alteration to the environment
Waste management hierarchy	The waste management hierarchy is a set of priorities for the efficient use of resources, which underpins the objectives of the Waste Avoidance and Resource Recovery Act 2001. The waste management hierarchy progresses from avoidance (most preferred), to re-use/recycling, to disposal (least preferred).

Executive summary

Overview

The Australian Government has committed to building a significant piece of national transport infrastructure by constructing a high performance and direct interstate freight rail corridor between Melbourne and Brisbane, via central-west New South Wales (NSW) and Toowoomba in Queensland. Inland Rail is a major national project that will enhance Australia's existing national rail network and serve the interstate freight market.

The Inland Rail route, which is about 1,700 kilometres long, involves:

- using the existing interstate rail line through Victoria and southern NSW
- upgrading about 400 kilometres of existing track, mainly in western NSW
- providing about 600 kilometres of new track in northern NSW and south-east Queensland.

Inland Rail has been divided into 13 projects, seven of which are located in NSW.

This environmental impact statement (EIS) considers the potential impacts of the proposal to construct and operate the Parkes to Narromine section of Inland Rail ('the proposal'). It has been prepared to support Australian Rail Track Corporation's (ARTC) application for approval of the proposal in accordance with the requirements of Part 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The proposal is State significant infrastructure, and is subject to approval by the NSW Minister for Planning. The EIS addresses the environmental assessment requirements of the Secretary of the Department of Planning and Environment ('the SEARs'), dated 8 November 2016. The proposal is also a controlled action under the Commonwealth *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act) (referral reference 2016/7731), and requires approval from the Australian Government Minister for the Environment and Energy.The EIS focuses on the key assessment requirements specified by the SEARs. It is supported by specialist technical assessment reports.

ARTC is seeking the proposal to be declared by the Minister for Planning as critical State significant infrastructure under section 115V of the EP&A Act.

The proposal

Key features

The proposal consists of 106 kilometres of upgraded track and associated facilities, and is generally located in the existing rail corridor between the towns of Parkes and Narromine, via Peak Hill. A new connection to the Broken Hill line is also proposed outside the existing rail corridor at the southern end of the proposal near Parkes.

The key features of the proposal involve:

- upgrading the track, track formation, and culverts within the existing rail corridor for a distance of 106 kilometres between Parkes and Narromine
- realigning the track where required within the existing rail corridor to minimise the radius of tight curves
- providing three new crossing loops within the existing rail corridor, at Goonumbla, Peak Hill, and Timjelly
- providing a 5.3 kilometre long rail connection between Inland Rail and the Broken Hill line to the west of Parkes ('the Parkes north west connection'), including a road bridge over the new section of rail at Brolgan Road ('the Brolgan Road overbridge').

Ancillary works would include works to level crossings, signalling and communications, signage, fencing, and services and utilities within the proposal site.

Timing

Subject to approval of the proposal, construction is planned to commence in early to mid 2018, and is expected to take about 18 months. Inland Rail as a whole is expected to be operational in 2025.

Operation

The proposal would form part of the rail network managed and maintained by ARTC. Train services would be provided by a variety of operators. Prior to the opening of Inland Rail as a whole, the rail line would be used by existing rail traffic, which includes trains carrying grain and ore at an average rate of about four trains per day.

It is estimated that the operation of Inland Rail would involve an annual average of about 8.5 trains per day in 2025, increasing to 15 trains per day in 2040. In the proposal site, this would be additional to the existing rail traffic using the rail line.

The trains would be a mix of grain, bulk freight, and other general transport trains. Total annual freight tonnages would be about 11.8 million tonnes in 2025, increasing to about 19 million tonnes in 2040 (from the existing two million tonnes of grain per year).

Train speeds would vary according to axle loads, and range from 80 to 115 kilometres per hour (for 21 tonne trains). Trains would operate 24 hours per day. They would be up to 1,800 metres long; carry double stacked containers; and have a height of 6.5 metres.

Need for the proposal

The proposal is a critical component of Inland Rail, and Inland Rail cannot proceed if the proposal does not proceed. The proposal has been designed to maximise use of the existing rail corridor, while still contributing to the overall efficiency of Inland Rail. Through the Parkes north west connection, the proposal would provide a more direct rail link between south-east Queensland, Adelaide, and Perth (via Parkes). This connection would deliver immediate interoperability with the high performance east-west trans-continental rail line to Perth.

Objectives of the proposal

The objectives of the proposal are to:

- provide upgraded rail infrastructure that meets the Inland Rail specifications, to enable trains using the Inland Rail corridor to travel between Parkes and Narromine, connecting with other sections of Inland Rail to the north and south
- provide new rail infrastructure to connect Inland Rail to the Broken Hill line at Parkes, to enable trains using Inland Rail to connect with destinations in South Australia and Western Australia via the east-west trans-continental rail line
- minimise the potential for environmental and community impacts, by maximising use of the existing rail corridor.

Inland Rail

Objectives

The objectives of Inland Rail are to:

- provide a rail link between Melbourne and Brisbane that is interoperable with train operations between Perth and Adelaide, to serve future rail freight demand, and stimulate growth for inter-capital and regional/bulk rail freight
- provide an increase in productivity that will benefit consumers through lower freight transport costs
- provide a step-change improvement in rail service quality in the Melbourne to Brisbane corridor and deliver a freight rail service that is competitive with road

- improve road safety, ease congestion, and reduce environmental impacts by moving freight from road to rail
- bypass bottlenecks within the existing metropolitan rail networks, and free up train paths for other services along the coastal route
- act as an enabler for regional economic development along the Inland Rail corridor.

Need for Inland Rail

There is no direct continuous inland rail link between Melbourne and Brisbane. Interstate rail freight currently travels between Melbourne and Sydney via Albury, and then between Sydney and Brisbane, generally along the coast. About 70 per cent of the freight between Melbourne and Brisbane is carried by road, principally the Newell Highway in NSW, and connecting highways in Victoria and Queensland.

Growth in freight demand

The Melbourne to Brisbane corridor is one of the most important general freight routes in Australia, supporting key population and employment precincts along the east coast and inland NSW. It is estimated that 21 million tonnes of non-bulk and complementary freight moves along this corridor each year. This is expected to grow to over 40 million tonnes per year by 2050.

With the population of the eastern states forecast to increase by 60 per cent over the next 40 years, the need for efficient and effective freight transport will continue to increase. Strong forecast population growth, accompanied by comparable growth in employment, is likely to place significant pressure on existing infrastructure and services.

Existing freight capacity and infrastructure issues

Without the increased use of rail, the growth in freight demand is likely to result in increasing pressure on the road network and associated safety and environmental issues, increased freight costs, and a loss of economic opportunity. The current national infrastructure network cannot support this projected growth, with increasing pressure on already congested roads through Sydney, and increasing use of heavy trucks such as B-doubles and, potentially, B-triples along the Hume-Pacific and Newell Highway corridors.

Rail is generally the most productive and efficient mode for freight travelling from regional areas to export ports and urban destinations. Freight trains travelling along the Melbourne to Brisbane corridor currently travel through the Sydney metropolitan rail network, often experiencing significant delays. Travel time reliability is poor, because of the priority given to passenger services, freight transit curfews in the Sydney metropolitan area, and substandard rail alignments elsewhere. Limited capacity during morning and afternoon passenger peaks restricts freight movements at these times.

Summary of the need for Inland Rail

Inland Rail is needed to improve the efficiency of freight moving between Melbourne and Brisbane. Inland Rail will bypass the Sydney metropolitan area, substantially cut the overall journey time to less than 24 hours, and increase the reliability of services between Melbourne and Brisbane. This is expected to increase the competitiveness of rail transport relative to road transport. The Parkes north west connection also allows train movements between Brisbane and Adelaide/Perth.

In addition, Inland Rail will encourage growth and investment in regional areas along the route through improved freight connections.

As noted by the *Australian Infrastructure Audit Report* (Infrastructure Australia, 2015), ‘Rail offers an alternative to road transport and societal benefits in terms of lower emissions, reduced road congestion and increased safety per tonne kilometre, particularly over longer distances or when carrying heavy goods.’

In summary, Inland Rail is needed to respond to the growth in demand for freight transport, and address existing freight capacity and infrastructure issues. The analysis of demands undertaken by ARTC indicated that there would be sufficient demand for Inland Rail.

Summary of the key findings of the EIS

Traffic, transport and access

The proposal would not result in any significant adverse impacts with respect to traffic, transport and access issues such as traffic operations, road capacity on the surrounding network, site access and road safety. During construction, traffic and transport would be managed by a construction traffic management plan prepared prior to the commencement of construction.

The proposal may result in changes to some level crossings. Consultation with potentially affected landowners would be undertaken, and changes would only occur following agreement with the property owner and relevant agencies.

The Brolgan Road overbridge has been included as part of the scope of the proposed Parkes north west connection to ensure that road access is maintained in this area. Construction of the north west connection would require potential changes to two local roads – Millers Lookout Road and Coopers Road. Any road realignment as a result of the Parkes north west connection would be determined during the detailed design phase where further investigations and consultation with stakeholders will be undertaken.

The road network has sufficient spare capacity to cater for the estimated construction and operation traffic, and no significant network impacts are predicted. The main operational traffic impacts relate to changes in delays at level crossings. Traffic activity at most level crossings in the study area is low, and the volume of traffic likely to be delayed by train activity is not substantial. There is capacity at each level crossing for delayed traffic to queue clear of adjacent intersections.

The transfer of freight to rail when the Inland Rail becomes operational would reduce truck movements particularly on the Hume Highway. This would have safety benefits and would reduce emissions.

Biodiversity

The majority of the study area has been heavily modified by past and ongoing disturbances associated with the existing rail corridor and surrounding agricultural activities. Clearance and maintenance of the existing rail corridor has resulted in fragmentation, a high level of disturbance, and degradation of vegetation communities. However, although the majority of the proposal site consists of non-native vegetation or cleared land, patches of native vegetation remain.

Biodiversity impact assessments of the proposal were undertaken, including a terrestrial biodiversity assessment prepared in accordance with the Framework for Biodiversity Assessment (OEH, 2014a), an aquatic biodiversity assessment, and an assessment of the potential impacts on matters listed under the EPBC Act.

The main potential impact of the proposal on biodiversity would occur during construction as a result of the clearing of native vegetation within the proposal site, including vegetation within the existing rail corridor, and in areas of the proposal site located outside the existing rail corridor. At this stage of the design, it is estimated that the proposal would require the permanent removal of 75.8 hectares of native vegetation. This vegetation includes threatened ecological communities listed under both the NSW *Threatened Species Conservation Act 1995* (TSC Act) and/or the EPBC Act. The assessment concluded that the proposal would not significantly impact any of the listed ecological communities as a result of the very small percentage decrease in the area of each community, and because the impacts would exist as small areas of scattered clearance over a long linear proposal site, rather than one localised area of impact. The assessment also concluded that the proposal would not significantly impact any threatened flora or fauna listed by the TSC Act.

ARTC is committed to minimising the environmental impacts of the proposal. The area of direct impact would be further refined during detailed design, with the aim of reducing the amount of vegetation clearing required as far as practicable. To mitigate the potential impacts to biodiversity, a Biodiversity Offset Strategy is being prepared in accordance with the *NSW Biodiversity Offsets Policy for Major Projects* (OEH, 2014b). This includes consideration of potential offset sites and/or opportunities to purchase biodiversity credits to offset the impacts of the proposal. Impacts to EPBC listed threatened ecological communities, flora and fauna would be offset under the Framework for Biodiversity Assessment (OEH, 2014a).

The main impacts on aquatic ecological systems would be as a result of the removal and construction of new culverts along the proposal site, and access over watercourses for movement of construction equipment and personnel. These potential impacts would be minimised by implementing the construction mitigation and management measures provided by the EIS. No impacts to aquatic threatened species or communities are predicted.

Noise and vibration

There is the potential for construction noise to exceed the relevant criteria at various receivers along the proposal site. The potential significance of the impacts would be minimised by the mobile nature of the majority of the construction works. Construction noise would be temporary and localised in nature, and the potential impacts would be managed through the implementation of noise control measures provided in the EIS, particularly for those sections of the project within close proximity of sensitive receivers (less than 50 metres).

Construction vibration was assessed, and management and mitigation measures have been provided to minimise the potential for significant human comfort and structural vibration impacts at the nearest receivers.

For operation, the noise modelling predicted that the noise levels at 28 residential receivers had the potential to exceed the redeveloped rail line criteria for operational rail noise by the year 2040. It is anticipated that Inland Rail would be complete in 2025, and this is when train movements would increase above existing numbers. However, the route is not expected to reach design capacity until 2040.

Mitigation options have been identified, and would be refined during detailed design and in consultation with affected receivers. Post construction noise monitoring would be undertaken at representative locations to verify the effectiveness of the applied mitigation measures with respect to the appropriate guidelines.

Air quality

The main potential impact on air quality during construction would occur as a result of the generation of dust from construction works and the movement of equipment and machinery. If dust is not adequately controlled, it could impact on surrounding sensitive receivers and agricultural land uses. These issues would be managed by implementing air quality management controls guided by the construction environmental management plan (CEMP).

During operation, the increase in diesel operated freight trains using the corridor has the potential to increase levels of pollutants such as nitrogen oxides and particulate matter. The air quality impact assessment considered the potential increases and concluded that the emissions are expected to be below the relevant impact assessment criteria. Air pollution from transport corridors decrease significantly with distance, and are not expected to be an issue for this proposal given the distance from the majority of potentially sensitive receivers.

Soils

Potential areas of contamination include agricultural land uses, mining operations and services stations.

Construction of the proposed has the potential to result in erosion and sedimentation and contamination of soils and surface waters. A number of management activities would be implemented to minimise these risks, including the implementation of a soil and water management sub-plan, and implementation of protocols for construction in areas of potentially contaminated soils.

Implementation of proposed environmental controls and management measures provided within the CEMP would reduce the risk of activities impacting on workers, surrounding residents, and the environment. The risk of contamination associated with the operation of the proposal is expected to be low. Sediment and erosion control plans for exposed soils would be adopted and implemented, which would reduce the risk of environmental impact.

Hydrology and flooding

The proposal involves raising the level of the rail formation along the majority of the proposal site, to achieve ARTC's design standards for flood immunity. This would include installing structures such as culverts on ephemeral watercourse crossings. The proposal would not directly impact on any perennial watercourses. Potential impacts during construction would be limited to inundation during flood events. These impacts would be short term and managed by implementing construction management measures as detailed in the CEMP.

The proposal would be constructed using pre-cast structures where practicable. This would reduce the size of the construction footprint, the extent of earthworks, and the timeframe to construct each structure. Minimising the duration of disturbance at each work site reduces the risk of a significant rainfall event flooding the work area.

The proposal incorporates design measures to avoid or minimise potential impacts on flooding and hydrology during operation. These focus on providing structures at all existing watercourse crossings to minimise the potential for changes in surface water flow paths.

Raising the height of the rail formation would impact surface water flows across the floodplain. This would change the upstream flooding regime, and result in more concentrated flows through culverts that discharge to downstream waterways.

Currently about 7,175 metres of the existing rail corridor in the proposal site is overtopped during a one per cent annual exceedance probability (AEP) flood event. Flood modelling for the local catchments predicts that the proposal would reduce the length of overtopping during this type of flood event to 406 metres.

The proposal is predicted to reduce the area of upstream flooding for flood events up to the two per cent AEP flood event. The reduction in the area subject to flooding for smaller flood events occurs because structures for the proposal have been designed to ensure that the one per cent AEP flood event does not exceed the top of the formation. The extent of flooding in a one per cent AEP flood event is anticipated to increase by about 10 per cent.

Water quality

The potential impacts of construction relate mainly to erosion and the generation of sediment, particularly during watercourse crossings and the construction of new culverts. To mitigate these impacts, erosion and sediment control measures would be implemented during construction in accordance with the CEMP. A surface water monitoring framework would be prepared to guide the monitoring of water quality.

During operation, surface water runoff would be managed through a drainage system that connects to cross drainage infrastructure at existing drainage lines and watercourses. The drainage system would include measures such as scour protection at culvert outlets to minimise the potential for scouring and erosion. Where appropriate, culvert outlets would be lined to minimise scouring.

Aboriginal heritage

Within the existing rail corridor, the construction and maintenance of the existing rail line is likely to have resulted in the removal/relocation of archaeological evidence that may have been present. No areas of moderate or high archaeological potential were identified within the proposal site.

Artefacts associated with two listed Aboriginal sites were identified within the proposal site. Two listed sites (consisting of a scarred tree and an artefact scatter) were identified adjacent to the proposal site. These sites were assessed as having low archaeological significance. The potential for impacts to these items would be avoided where practicable. Where impacts are unavoidable, the significance of impacts would be minimised by the implementation of the mitigation measures provided.

Historic heritage

No heritage listed items are located within or near the proposal site, and therefore no direct or indirect impacts to any listed heritage impacts are predicted. The proposal would impact the existing rail line, which is a potential heritage item considered to be generally of local significance. It also has the potential to indirectly impact a potential heritage item considered to be of local significance – an old cottage, referred to as Wyanga cottage, located on Peak Hill Railway Road. The significance of impacts would be minimised by the implementation of the mitigation measures provided.

Landscape and visual amenity

The proposal would generate visual impacts during construction. Construction impacts would be temporary and limited to the construction period.

Operation impacts of the proposal would occur as a result of the introduction of new structures in the landscape, mainly associated with the Parkes north west connection. The proposal has been designed to minimise the potential for landscape and visual impacts, through careful siting of proposal elements, and by minimising clearing as far as practicable. Mitigation measures are provided to further reduce the visual impacts of the proposal. These would be implemented during the detailed design and construction phases.

Land use and property

The main potential impacts on land use would occur during the construction phase. Impacts include temporary disruption to land use along the construction corridor for construction areas, compounds and haulage routes. These impacts, such as soil compaction, disruption of services or utilities, changes in access and interrupted land management, would be short term and minimised with the implementation of mitigation measures.

Land use impacts during operation would mainly relate to acquisition. Acquisition of privately owned land would be required for construction of the Parkes north west connection. Based on the current design, no properties require complete acquisition, however the option for complete acquisition would be discussed with landowners where a property is materially affected.

While the extent of flooding in a one per cent AEP flood event is anticipated to increase by about 10 per cent, the duration of flooding would be generally less than a few hours, with increases in inundation mainly impacting (in terms of total area) cropping and grazing land uses. No buildings, either residential or business related, would experience increases in flooding frequency or depth as a result of the proposal.

Socio-economic impacts

Both socio-economic benefits and impacts would result from the construction and operation of the proposal. Beneficial impacts during construction include employment (an estimated average workforce of 150 people would be required to construct the proposal), training opportunities, and flow on local and regional economic benefits. Impacts during construction would include potential impacts on the amenity of the local community, and impacts associated with the inflow of the workforce into the local area.

Beneficial impacts as a result of the operation of the proposal include the following opportunities, which would be refined as Inland Rail progresses:

- better access to and from regional markets (including via the Parkes intermodal facility)
- enabler for regional economic development along the Inland Rail corridor
- safety and amenity benefits as a result of the reduction of freight transport on major road corridors.

The potential for environmental and social disturbance as a result of construction has to be balanced against the long term benefits of Inland Rail overall.

Other issues

The main wastes that would be generated during construction of the proposal include excess spoil, vegetation, construction materials, and general waste. All of the spoil generated would be reused on site through the creation of spoil mounds within the existing rail corridor, except where the presence of contamination is noted.

The potential for cumulative impacts resulting from the interaction of this proposal with other projects, either existing or proposed, in the surrounding area is considered low. Depending on construction timing of the proposal and other projects, there may be an increase in traffic, housing demand, and workforce demand. There are no anticipated cumulative impacts during operation.

Environmental mitigation and management

Potential impacts resulting from the proposal are considered manageable through the implementation of the proposed mitigation and management measures.

The detailed design for the proposal is being carefully developed with the objective of minimising potential impacts on the local and regional environment and the local community. The design and construction methodology would continue to be developed with this overriding objective in mind, taking into account the input of stakeholders.

To manage the potential impacts identified by the EIS, and in some cases remove them completely, the assessment chapters outline a range of mitigation and management measures that would be implemented during construction and operation. Chapter 27 summarises the environmental mitigation and management measures that would be implemented. The environmental performance of the proposal would be managed by the implementation of the CEMP and an operation environmental management plan. These plans would also ensure compliance with relevant legislation and any conditions of approval.