

PART B  
Impact assessment  
proposal infrastructure

INLAND  
RAIL 



CHAPTER B6  
Aboriginal heritage



**Narromine to Narrabri**  
Environmental Impact Statement

**ARTC**

The Australian Government is delivering  
Inland Rail through the Australian  
Rail Track Corporation (ARTC), in  
partnership with the private sector.

# Contents

## B6. ABORIGINAL HERITAGE

### B6.1 Approach

- B6.1.1 Legislative and policy context to the assessment
- B6.1.2 Methodology
- B6.1.3 Risks identified
- B6.1.4 How potential impacts have been avoided/minimised

### B6.2 Existing environment

- B6.2.1 Aboriginal historical context
- B6.2.2 Aboriginal sites and places
- B6.2.3 Native title
- B6.2.4 Archaeological potential
- B6.2.5 Significance of identified sites

### B6.3 Impact assessment—construction

- B6.3.1 Impact on Aboriginal sites and places
- B6.3.2 Impacts on areas of archaeological potential

### B6.4 Impact assessment—operation

### B6.5 Mitigation and management

- B6.5.1 Approach
- B6.5.2 List of mitigation measures
- B6.5.3 Managing residual impacts

## B6-1

### B6-1

B6-1

B6-1

B6-3

B6-3

### B6-3

B6-3

B6-3

B6-5

B6-5

B6-5

### B6-8

B6-8

B6-10

### B6-11

### B6-11

B6-11

B6-13

B6-15

## Figures

Figure B6.1

Areas of moderate or higher archaeological potential

B6-6

## Tables

Table B6.1

Listed Aboriginal sites previously recorded within 10 metres of the proposal site

B6-4

Table B6.2

Aboriginal sites identified during field surveys located within 10 metres of the proposal site

B6-4

Table B6.3

Significance assessments for Aboriginal sites identified within 10 metres of the proposal site

B6-8

Table B6.4

Sites with the potential to be impacted by the proposal

B6-9

Table B6.5

Sites located close to the proposal site (within 10 metres) that may be vulnerable to impact

B6-10

Table B6.6

Potential impacts on Aboriginal cultural heritage values

B6-11

Table B6.7

Aboriginal heritage mitigation measures

B6-13

Table B6.8

Residual impact assessment—Aboriginal heritage

B6-16

## B6. Aboriginal Heritage

This chapter provides a summary of the potential impacts of the Narromine to Narrabri project (the proposal) on Aboriginal heritage. A full copy of the assessment results is provided in Technical Report 6—Aboriginal cultural heritage assessment.

### B6.1 Approach

A summary of the approach to the assessment is provided in this section, including the legislation, guidelines and/or policies driving the approach, and the methodology used to undertake the assessment. Further information is provided in Technical Report 6.

#### B6.1.1 Legislative and policy context to the assessment

##### Relevant legislation, policies and guidelines

The assessment was undertaken in accordance with the SEARs and with reference to the requirements of relevant legislation, policies and/or assessment guidelines, including:

- ▶ The EP&A Act, the *National Parks and Wildlife Act 1974* (NSW), the EPBC Act, the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (Cth), the *Native Title Act 1993* (Cth) and the *Aboriginal Land Rights Act 1983* (Cth)
- ▶ *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales 2010* (DECCW, 2010a)
- ▶ *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, 2010b)
- ▶ *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW, 2010c)
- ▶ *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH, 2011).

##### Secretary's Environmental Assessment Requirements

The SEARs relevant to Aboriginal heritage, together with a reference to where they are addressed in the EIS, are provided in Appendix A.

#### B6.1.2 Methodology

##### Study area

The study area for the Aboriginal heritage cultural assessment included the proposal site (described in chapter A2) and the immediate vicinity of the proposal site (for any indirect impacts that could occur as a result of the proposal).

##### Key tasks

The Aboriginal cultural heritage assessment was undertaken in accordance with the guidelines and requirements described in section B6.1.1, and sections 2 and 6.1 of Technical Report 6 and involved:

- ▶ A desktop review of archaeological literature and data, including a search/review of:
  - ▶ Aboriginal Heritage Information Management System (AHIMS) in January 2019 and March 2020 for a 2-km wide corridor around the proposal site
  - ▶ EPBC Act Protected Matters Search Tool
  - ▶ Local environmental plans
  - ▶ Previous archaeological investigations.
- ▶ Developing a predictive model in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW, 2010c) to identify areas likely to be of cultural sensitivity within the study area that require survey
- ▶ Field surveys (where access was available) of areas considered to be moderately to highly sensitive (with respect to Aboriginal culture and heritage), areas identified from the predictive model, and areas where known Aboriginal heritage sites and Aboriginal cultural places were identified from the desktop study (see below)
- ▶ Consultation with key Aboriginal stakeholders in the area (see below)

- ▶ Assessing the significance of sites/areas of potential sensitivity within the proposal site
- ▶ Assessing the potential impacts on Aboriginal sites, places and objects
- ▶ Providing management and mitigation measures.

### Aboriginal consultation

Aboriginal consultation has been undertaken in accordance with the requirements of *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, 2010b). This included:

- ▶ Identifying key Aboriginal stakeholders, including native title claimant groups and local Aboriginal land councils (LALCs)
- ▶ Sending letters to relevant organisations requesting details of Aboriginal people who may hold cultural knowledge relevant to determining the Aboriginal significance of Aboriginal objects and/or place within and adjacent to the proposal site
- ▶ Notification of the proposal, assessment, and registration of interest (a total of 33 Aboriginal parties registered interest in the proposal)
- ▶ Presentation of information about the proposal and invitations to participate in targeted field surveys.

Further information on the consultation process is provided in chapter 4 of Technical Report 6.

### Site survey

A series of surveys were undertaken between September 2018 and October 2019. The first stage of surveys involved preliminary surveys of publicly accessible land and geotechnical investigation sites, to assess the nature and extent of Aboriginal sites and to identify potentially sensitive areas. This enabled a rapid survey to ground truth areas identified during the preliminary desktop review and to inform the predictive modelling. The preliminary surveys were accompanied by representatives from the LALCs and native title applicant groups.

These were followed by targeted surveys of areas predicted to have moderate-to-high sensitivity based on the results of the predictive modelling, where property access was available. The targeted surveys were accompanied by Registered Aboriginal Parties (RAPs) in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, 2010b).

Additional surveys were undertaken of borrow pit locations and construction access routes.

The targeted surveys were undertaken in accordance with the requirements of the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010c) and consisted of vehicle and pedestrian surveys. The vehicle surveys were used to obtain a broader understanding of the general environment and were considered appropriate given the disturbed nature of large parts of the proposal site (cleared agricultural land). The pedestrian surveys focused on sensitive areas. The surveys were designed to assess an adequate sample of landforms within the study area and identify any visible surface evidence of Aboriginal heritage sites and landforms.

Archaeological surveys were completed in a large number of areas identified as culturally sensitive; however, eight areas of moderate-to-high sensitivity were not able to be surveyed in the proposal site due to property access restrictions.

These access constraints have been addressed in discussion with registered Aboriginal parties during field surveys. Some culturally sensitive areas (at Wallaby, Ewenmar, Marthaguy, Gulargambone, Tenandra and Baradine creeks, and the Castlereagh and Namoi rivers) would require physical examination prior to construction commencing. The mitigation measures (see section B6.5) provide for a targeted archaeological survey of these areas.

For the purposes of the assessment, these areas have been conservatively assumed to contain moderate-to-high archaeological potential and the areas that fall within the proposal site have been assumed to be impacted by the proposal.

### Test excavations

Test excavations were undertaken on 10 April 2019 at two geotechnical investigation locations near the Macquarie River identified to be of high cultural significance.

Further detail is provided in section 6.3 of Technical Report 6.



### **B6.1.3 Risks identified**

An environmental risk assessment for the proposal (Appendix E) included consideration of potential Aboriginal heritage risks. Aboriginal heritage risks with an overall assessed risk rating of medium or above, identified by the environmental risk assessment, included:

- ▶ Potential impacts on registered Aboriginal heritage items/sites in the proposal site
- ▶ Impacts on unrecorded Aboriginal sites and/or areas of archaeological sensitivity or cultural value
- ▶ Impacts on areas predicted to have moderate-to-high archaeological potential.

The Aboriginal heritage assessment considered the potential risks identified by the environmental risk assessment in addition to potential risks and impacts identified by the scoping report (see section A9.1), the SEARs and relevant guidelines and policies (as appropriate).

### **B6.1.4 How potential impacts have been avoided/minimised**

As described in section A6.2, the shortlist of route options was subject to a detailed assessment, which included assessment of a broad study area to identify key constraints early in the design process and assist with avoiding and minimising impacts. Potential impacts on Aboriginal heritage were minimised, as far as practicable, by:

- ▶ Relocating the alignment to the west in the vicinity of Cumbil Creek, to avoid direct impacts on grinding grooves located on the rocky creek bed
- ▶ Extending bridges beyond watercourses to include flood storage areas and avoid areas with the potential to affect sensitive areas on creek banks
- ▶ Locating the proposed bridge over Macquarie River with consideration of known Aboriginal heritage sites and, where practicable, avoiding sites.

## **B6.2 Existing environment**

### **B6.2.1 Aboriginal historical context**

The northern portion of the study area falls within the traditional lands of the Gomeroi People who are one of the largest language groups in Australia. Gomeroi people have traditional territory that extends north to the townships of Quirindi, Tamworth, and Narrabri, Moree and Mungindi in northern NSW, south to Muswellbrook, and west to Walgett.

The southern part of the study area includes people from the Ngemba, Ngiyampaa, Wangaayuwun and Wailwan communities. The Ngemba community is located in and around the townships of Brewarrina, Lightning Ridge, Walgett and Bourke, on the banks of the Barwon River in north-western NSW. The Ngiyampaa, Wangaayuwun and Wailwan people are focused on the areas around Gulargambone and Gilgandra.

Further detail on the Aboriginal historical context is provided in section 4.2 of Technical Report 6.

### **B6.2.2 Aboriginal sites and places**

#### **Listed sites**

The results of the AHIMS search identified five registered sites within 10 metres (m) of the proposal site, including three scarred trees, one artefact scatter and one confirmed archaeological deposit. Three sites (35-3-0175, 35-3-0195 and 35-3-0196) are reported to be located within the proposal site.

The previously listed sites, and their reported locations with respect to the proposal site, are listed in Table B6.1. The results have been limited to sites within 10 m of the proposal site as they are considered to be most vulnerable to impact.

A full list of sites identified within 400 m of the proposal site are provided in Technical Report 6. The location of one previously listed site (35-3-0021) was confirmed during the field surveys. The other registered sites would need to be confirmed prior to construction commencing (see Table B6.7).

**TABLE B6.1 LISTED ABORIGINAL SITES PREVIOUSLY RECORDED WITHIN 10 METRES OF THE PROPOSAL SITE**

AHIMS site	Catchment	Site type	Reported distance from the proposal site
35-3-0175 <sup>1</sup>	Backwater Cowal	Modified (scarred) tree	Within the proposal site
35-3-0021	Macquarie River	Modified (canoe) tree	10 m from the proposal site
35-3-0195 <sup>1</sup>	Macquarie River	Artefact scatter	Within the proposal site
35-3-0196 <sup>1</sup>	Macquarie River	Confirmed archaeological deposit	Within the proposal site
35-3-0200 <sup>1</sup>	Macquarie River	Modified (scarred) tree	10 m from the proposal site

Note: 1. Indicates site was not able to be confirmed in the reported location.

## Aboriginal places

No Aboriginal places declared under section 84 of the NPW Act, or Aboriginal places of heritage significance defined by the *Standard Instrument—Principal Local Environmental Plan*, are located within or near the proposal site. Bridge Reserve and Mack Reserve are located about 5 km to the west of the proposal site. Both places are listed on the NSW State Heritage Register and are historic camping places that were occupied by Aboriginal people.

## New sites identified during the survey

A total of 152 sites and 13 areas of potential archaeological deposit (PAD) were identified during surveys and have been registered on AHIMS. Sites identified within 10 m of the proposal site (including sites within the proposal site) are listed in Table B6.2.

The distribution of sites reflects the use of waterways as primary transit and camping areas within the lowland alluvial plains and river terraces. The dominant site type was confirmed to be culturally modified trees. Stone tools and raw material types were confirmed to be dominated by quartz and sandstone grinding implements. The importance of vantage points was also confirmed, as was the rarity of grinding groove sites.

**TABLE B6.2 ABORIGINAL SITES IDENTIFIED DURING FIELD SURVEYS LOCATED WITHIN 10 METRES OF THE PROPOSAL SITE**

AHIMS site <sup>1</sup>	Catchment	Site type	Proximity to proposal site
35-3-0254	Macquarie River	Modified (scarred) tree	Within 10 m of the proposal site
<b>35-3-0276</b>	Macquarie River	Artefact scatter	Partially within the proposal site
<b>27-6-0035</b>	Ewenmar Creek	Modified (scarred) tree	Within the proposal site
<b>27-6-0036</b>	Ewenmar Creek	PAD	Within the proposal site
<b>27-6-0042</b>	Boothaguy Creek	Modified (scarred canoe) tree	Within the proposal site
<b>27-6-0041</b>	Boothaguy Creek	Modified (scarred) tree	Within the proposal site
<b>27-6-0037</b>	Boothaguy Creek	Modified (scarred) tree	Within the proposal site
<b>28-1-0060</b>	Gulargambone Creek	Artefact scatter and PAD	On the boundary and PAD likely to extend through the proposal site
<b>28-1-0090</b>	Gulargambone Creek	Artefact scatter and PAD	On the boundary and PAD likely to extend through the proposal site
28-4-0283	Castlereagh River	Modified (scarred) tree	Within 5 m of the proposal site
<b>28-4-0280</b>	Castlereagh River	Artefact scatter and PAD	Partially within the proposal site
<b>28-1-0063</b>	Baronne Creek	Modified (scarred) tree	Within the proposal site
<b>28-1-0064</b>	Baronne Creek	Modified (scarred) tree	Within the proposal site
<b>28-1-0062</b>	Baronne Creek	Modified (scarred) tree	Within the proposal site
<b>28-1-0087</b>	Mungery Creek	Modified (scarred) tree	Within the proposal site
<b>28-1-0084</b>	Mungery Creek	Modified (scarred) tree	Within the proposal site
<b>28-1-0086</b>	Mungery Creek	Modified (scarred) tree	Within the proposal site
<b>28-1-0083</b>	Mungery Creek	Modified (scarred) tree	Within the proposal site

AHIMS site <sup>1</sup>	Catchment	Site type	Proximity to proposal site
<b>28-1-0059</b>	Calga Creek and Looking Glass Creek	Artefact scatter and PAD	Within the proposal site
<b>28-1-0095</b>	Calga Creek and Looking Glass Creek	Artefact scatter	Within the proposal site
<b>28-1-0096</b>	Noonbar Creek	Artefact scatter	Within the proposal site
<b>19-5-0226</b>	Baradine Creek	Artefact scatter	Within the proposal site
19-5-0223	Baradine Creek	Isolated find	Within 10 m of the proposal site
19-5-0224	Baradine Creek	Isolated find	Within 10 m of the proposal site
<b>19-5-0230</b>	Baradine Creek	PAD	Partially within the proposal site
<b>19-6-0180</b>	Bohena Creek	Artefact scatter	Within the proposal site

Note 1: **Red bold font** indicates sites within (or partially within) the proposal site.

### B6.2.3 Native title

A review of the Native Title Tribunal records identified two current native title claims in the study area, including:

- ▶ The Gomeroi People claim, which covers about 11 million hectares (ha) of northern NSW and extends for about 182 km along the proposal site between the Kamilaroi Highway and the Castlereagh Highway
- ▶ The Ngemba, Ngiyampaa, Wangaaypuwan and Wailwan claim, which covers about 10 million ha of western NSW and extends for about 16 km along the proposal site between the Oxley Highway and the Castlereagh Highway.

### B6.2.4 Archaeological potential

An assessment of archaeological potential was undertaken as part of the predictive modelling. The model was based on the distribution of known sites, sensitive landscape, resource areas and waterways. The likelihood of Aboriginal heritage sites occurring in the study area is influenced by a range of factors, including the durability of the material evidence and the subsequent level of disturbance.

Areas with moderate or higher archaeological potential are shown in Figure B6.1.

### B6.2.5 Significance of identified sites

The Burra Charter defines cultural significance in terms of aesthetic, scientific, historic and social values. Aboriginal cultural heritage is typically assessed according to its social and scientific significance; however, other values may also be important. The assessment of significance provides a guideline for determining appropriate mitigation and management strategies. The relationship between levels of significance and management strategies can be summarised as follows:

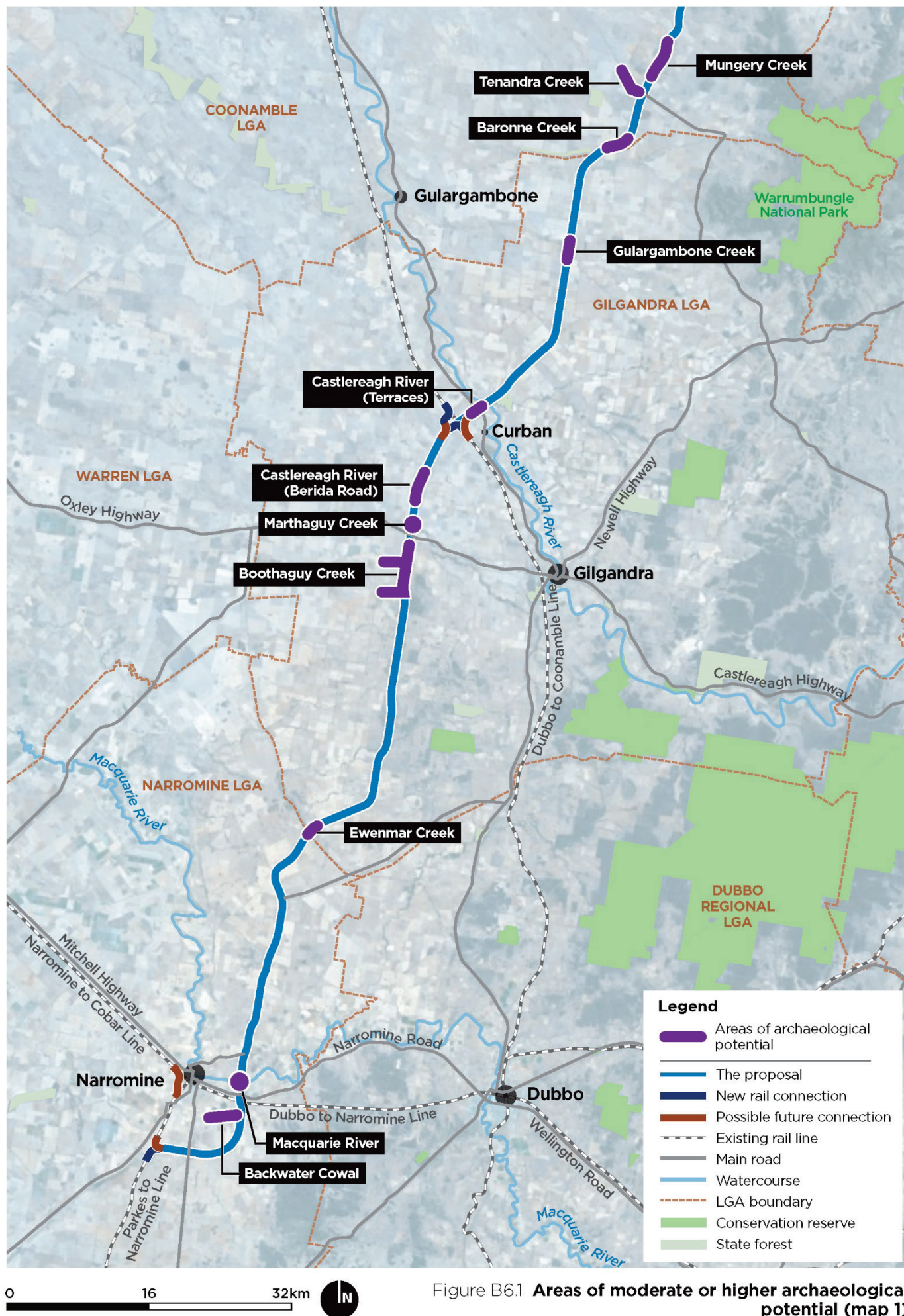
- ▶ High significance—the site should be conserved and protected from the impacts of development, where possible
- ▶ Moderate significance—the site should be protected if possible; however, if impacts on the site are unavoidable, appropriate mitigation strategies should be implemented prior to impact
- ▶ Low significance—the site should be protected if possible; however, if impacts on the site are unavoidable, the presence of the site should not impede the proposed development.

The significance of sites within or directly adjacent to the proposal site were assessed; however, as the nature and presence of Aboriginal objects associated with a PAD are unknown, it is not possible to assess the significance of a PAD without archaeological testing. As such, significance assessments for the two PADs (27-6-0036 and 19-5-0230) were not undertaken. The four artefact scatter sites that have PADs associated with them (sites 28-4-0280, 28-1-0090, 28-1-0060 and 28-1-0059) have been included; however, significance assessments have only been completed on the artefact scatter elements of the site in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales 2010* (DECCW, 2010a). Archaeological testing of the PADs would need to be undertaken prior to construction to establish the extent and nature of any subsurface deposits in accordance with the due diligence guidelines (see section B6.5).

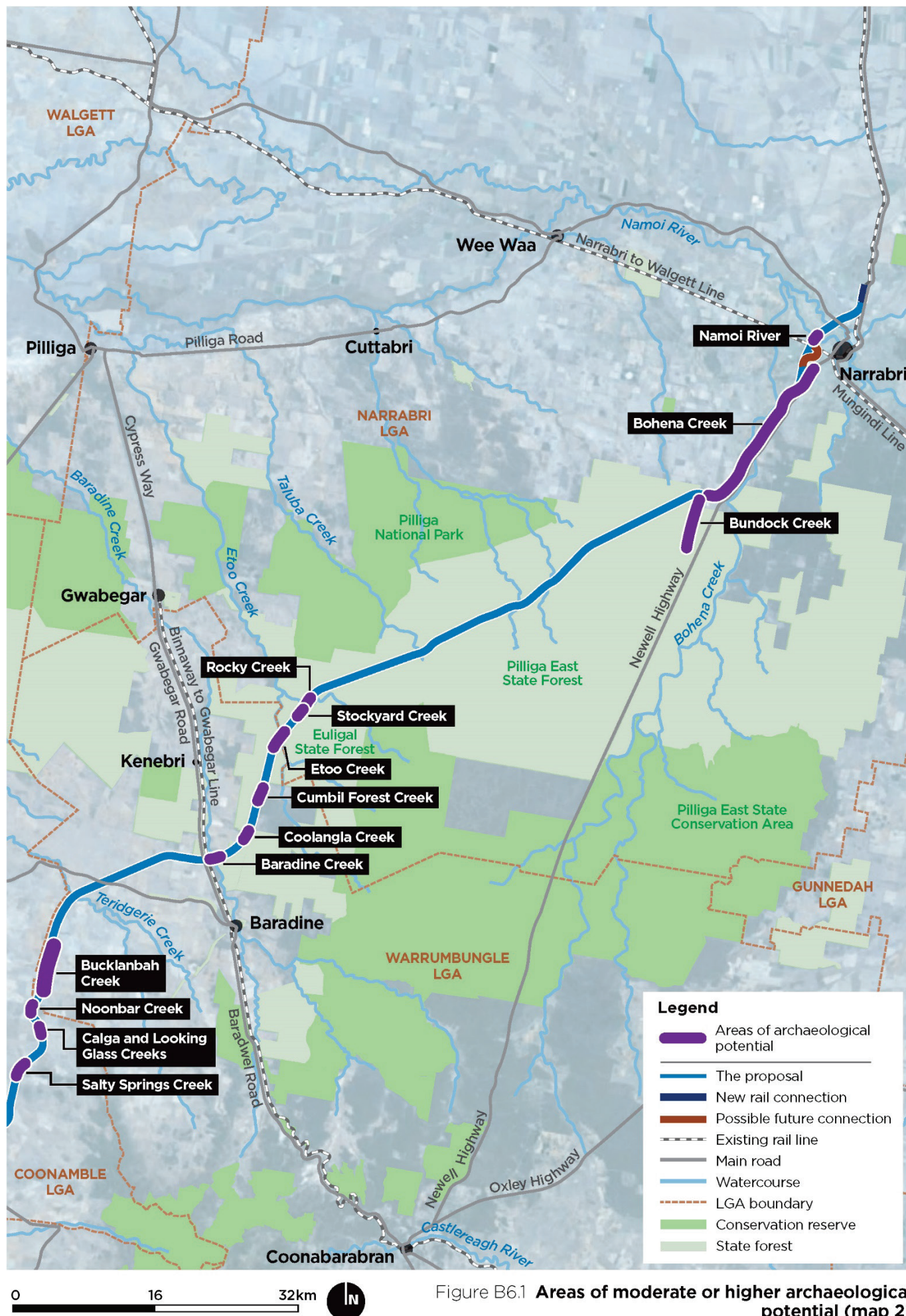
The assessment results found that the overall significance rating was:

- ▶ Moderate to high at five sites
- ▶ Moderate at 14 sites
- ▶ Low to moderate at four sites
- ▶ Low at five sites.









The archaeological significance for sites within 10 m of the proposal site is provided in Table B6.3.

**TABLE B6.3 SIGNIFICANCE ASSESSMENTS FOR ABORIGINAL SITES IDENTIFIED WITHIN 10 METRES OF THE PROPOSAL SITE**

AHIMS site REF	Social significance	Historical significance	Scientific significance	Aesthetic significance	Overall significance
35-3-0175	High	n/a	Low	Moderate	Low
35-3-0021	High	Low	Moderate	Moderate	Moderate to high
35-3-0195	High	Low	Moderate	Moderate	Moderate
35-3-0196	High	Low	Moderate	Moderate	Moderate
35-3-0200	High	n/a	Moderate	Moderate	Moderate
35-3-0254	High	n/a	Moderate	Moderate	Moderate
35-3-0276	High	n/a	Moderate	Moderate	Moderate
27-6-0035	High	n/a	Moderate	Moderate	Moderate
27-6-0042	High	n/a	Moderate	Moderate	Moderate to high
27-6-0041	High	n/a	Moderate	Moderate	Moderate to high
27-6-0037	High	n/a	Moderate	Moderate	Moderate to high
28-1-0060 <sup>1</sup>	High	n/a	Low to moderate	Moderate	Low to moderate
28-1-0090 <sup>1</sup>	High	n/a	Low to moderate	Moderate	Low to moderate
28-4-0283	High	n/a	Moderate	Moderate	Moderate to high
28-4-0280 <sup>1</sup>	High	n/a	Low to moderate	Moderate	Low to moderate
28-1-0063	High	n/a	Moderate	Moderate	Moderate
28-1-0064	High	n/a	Moderate	Moderate	Moderate
28-1-0062	High	n/a	Moderate	Moderate	Moderate
28-1-0087	High	n/a	Moderate	Moderate	Moderate
28-1-0084	High	n/a	Moderate	Moderate	Moderate
28-1-0086	High	n/a	Moderate	Moderate	Moderate
28-1-0083	High	n/a	Moderate	Moderate	Moderate
28-1-0059 <sup>1</sup>	High	n/a	Moderate	Moderate	Moderate
28-1-0095	High	n/a	Low	Low	Low
28-1-0096	High	n/a	Low	Low	Low
19-5-0226	High	n/a	Low	Moderate	Low to moderate
19-5-0223	High	n/a	Low	Low	Low
19-5-0224	High	n/a	Low	Low	Low
19-6-0180	High	n/a	Low	Moderate	Low

Note:

1. For PADs associated with artefact scatters, significance assessments have been undertaken for the artefact scatter element as described in section B6.2.5.

## B6.3 Impact assessment—construction

### B6.3.1 Impact on Aboriginal sites and places

#### Direct impacts

The main risks relating to Aboriginal heritage would occur during construction. Construction activities have the potential to disturb identified Aboriginal sites and areas of archaeological potential as a result of:

- ▶ Vegetation clearing
- ▶ Excavation to install infrastructure and utilities
- ▶ Construction vehicle movements.

Construction of the proposed rail infrastructure would directly impact 25 Aboriginal sites/items including:

- ▶ 12 modified (scarred) trees (one of which is a scarred canoe tree)
- ▶ Six artefact scatters
- ▶ Four artefact scatters and associated PADs
- ▶ Two PADs
- ▶ One confirmed archaeological deposit.

A full list of these items, including the level of impact, is provided in Table B6.4.

Most of the sites that have the potential to be impacted have been assessed as having a significance rating of moderate or lower. Five sites have been assessed as having moderate-to-high overall significance.

No known Aboriginal cultural heritage sites or places would be directly impacted by the proposed road works.

**TABLE B6.4 SITES WITH THE POTENTIAL TO BE IMPACTED BY THE PROPOSAL**

Site ref	Type	Status	Overall significance	Degree of impact
35-3-0175 <sup>1</sup>	Modified (scarred) tree	Previously listed	Moderate to high	Whole
35-3-0195 <sup>1</sup>	Artefact scatter	Previously listed	Moderate	Whole
35-3-0196 <sup>1</sup>	Confirmed archaeological deposit	Previously listed	Moderate	Whole
35-3-0276	Artefact scatter	New	Moderate to high	Partial
27-6-0035	Modified (scarred) tree	New	Moderate	Whole
27-6-0036	PAD <sup>2</sup>	New	N/A	Whole
27-6-0042	Modified (scarred canoe) tree	New	Moderate to high	Whole
27-6-0041	Modified (scarred) tree	New	Moderate to high	Whole
27-6-0037	Modified (scarred) tree	New	Moderate to high	Whole
28-1-0060	Artefact scatter and PAD <sup>2</sup>	New	Low to moderate	Potential <sup>3</sup>
28-1-0090	Artefact scatter and PAD <sup>2</sup>	New	Low to moderate	Potential <sup>3</sup>
28-1-0063	Modified (scarred) tree	New	Moderate	Whole
28-1-0064	Modified (scarred) tree	New	Moderate	Whole
28-1-0087	Modified (scarred) tree	New	Moderate	Whole
28-1-0084	Modified (scarred) tree	New	Moderate	Whole
28-4-0280	Artefact scatter and PAD <sup>2</sup>	New	Low to moderate	Partial
28-1-0062	Modified (scarred) tree	New	Moderate	Whole
28-1-0086	Modified (scarred) tree	New	Moderate	Whole
28-1-0083	Modified (scarred) tree	New	Moderate	Whole
28-1-0059	Artefact scatter and PAD <sup>2</sup>	New	Moderate	Whole
28-1-0095	Artefact scatter	New	Low	Whole
28-1-0096	Artefact scatter	New	Low	Whole
19-5-0226	Artefact scatter	New	Low	Whole
19-5-0230	PAD <sup>2</sup>	New	N/A	Partial
19-6-0180	Artefact scatter	New	Low	Whole

Notes:

1. Site was not able to be confirmed in the reported location due to access restrictions.
2. As noted in section B6.2.5, archaeological examination of subsurface deposits would need to be undertaken prior to assigning significance ratings to PADs. For PADs associated with artefact scatters, significance assessments have been undertaken for the artefact scatter element only.
3. Extent of the PAD and degree of impact unknown.

## Inadvertent impacts

Sites located near the proposal site have the potential to be inadvertently impacted by the movement of machinery and/or construction vehicles if appropriate management measures are not implemented. The highest potential for inadvertent impact would be to those items within 10 m of the site—these are listed in Table B6.5.



Potential inadvertent impacts would be managed by implementing the measures provided in section B6.5.

**TABLE B6.5 SITES LOCATED CLOSE TO THE PROPOSAL SITE (WITHIN 10 METRES) THAT MAY BE VULNERABLE TO IMPACT**

Site ref	Type	Status	Overall significance
35-3-0021 <sup>1</sup>	Modified (scarred) tree	Previously listed	Moderate to high
35-3-0200	Modified (scarred) tree	Previously listed	Moderate
35-3-0254	Modified (scarred) tree	New site	Moderate to high
28-4-0283	Modified (scarred) tree	New	Moderate to high
28-4-0284	Modified (scarred) tree	New	Moderate to high
19-5-0223	Isolated find	New	Low
19-5-0224	Isolated find	New	Low
19-5-0239	Modified (scarred) tree	New	Moderate

Note:

1. Indicate sites that were not able to be confirmed in the reported locations due to access restrictions.

### B6.3.2 Impacts on areas of archaeological potential

As shown in Figure B6.1, the proposal would have the potential to affect areas predicted to have moderate-to-high archaeological potential (based on assessed cultural sensitivity).

As described in section B6.1.2, sections of the following areas of archaeological potential would need to be surveyed prior to construction:

- ▶ Wallaby Creek
- ▶ Ewenmar Creek
- ▶ Marthaguy Creek
- ▶ Castlereagh River
- ▶ Gulargambone Creek
- ▶ Tenandra Creek
- ▶ Baradine Creek
- ▶ Namoi River.

Six PADs (two standalone and four associated with artefact scatters) are located within the proposal site and would be impacted during construction. These sites would require archaeological testing prior to the commencement of construction to confirm the extent of the PADs. This would involve test excavation and potential salvage. Any findings would require detailed analysis and reporting of any cultural material collected. All investigations would be undertaken in consultation with the RAPs, in accordance with the archaeological survey and test excavation methodologies approved for the proposal, once property access is available.

### Impacts on cultural heritage values

In addition to archaeological features, such as artefact scatters or culturally modified trees, Aboriginal cultural heritage values include those associated with permanent water sources, traditional thoroughfares, burial sites and those associated with Aboriginal culture and dreaming.

Consultation with registered Aboriginal parties identified that all Aboriginal cultural heritage values are considered to be of high cultural (social) significance. An assessment of potential impacts on places of cultural value identified in the proposal site is summarised in Table B6.6. The management of impacts on items of cultural significance would be considered with input from the registered Aboriginal parties (see section B6.5.2).

**TABLE B6.6 POTENTIAL IMPACTS ON ABORIGINAL CULTURAL HERITAGE VALUES**

Site type	Cultural values
Camp sites	Traditional campsites demarcated by artefact scatters and association with low gradient alluvial landforms were identified as having cultural significance. Sites identified as potentially directly impacted by the proposal include: Macquarie River (35-3-0195, 35-3-0196 and 35-3-0276), Castlereagh River (28-4-0280), Gulargambone Creek (28-1-0090 and 28-1-0060), Calga Creek and Looking Glass Creek (28-1-0059 and 28-1-0095), Noonbar Creek (28-1-0096), Baradine Creek (19-5-0226) and Bohena Creek (19-6-0180).
Resource gathering locations and techniques	Resource gathering locations were noted by RAPs to be potentially impacted at the Backwater Cowal, Macquarie River, Cumbil Forest Creek and at the confluence of Calga Creek and Looking Glass Creek.
Modified (scarred) trees	Scarred trees are of great importance to knowledge holders as they are tangible links to the past. Bark was a useful and versatile material that could be used for a range of commonplace tasks, including the construction of shelters, watercraft and containers. All scarred trees identified within the study area are considered as culturally sensitive. As described in section B6.3.1, 12 scarred trees are located within the proposal site and may be directly impacted during construction. Scarred trees located immediately adjacent to the proposal site are also vulnerable to inadvertent impacts during construction. Mitigation measures provided in Table B6.7 would be implemented to minimise impacts on scarred trees as far as practicable.
Aboriginal plants and animals	Aboriginal plants and animals are significant to Traditional Owners. During field work, the fauna and flora were often mentioned in the context of spiritual importance. Throughout the consultation process, plants and animals were often mentioned in discussion with resource collection.
Aboriginal culture and dreaming	Registered Aboriginal knowledge holders identified areas of spiritual and cultural significance marked by prominent landforms, such as Table Top Mountain and Cumbil Forest Creek, and expressed a desire for implementation of cultural protocols in respect to these places during construction, as part of the heritage induction.

## B6.4 Impact assessment—operation

Access to the rail corridor would be required during routine maintenance and repairs. As these areas would have been previously assessed and disturbed during construction, further impacts on Aboriginal heritage are considered unlikely. The potential for any impacts on Aboriginal sites outside the operational footprint would be managed in accordance with ARTC's standard operational environmental management procedures.

## B6.5 Mitigation and management

### B6.5.1 Approach

#### Approach to mitigation and management

##### Approach to managing the key potential impacts identified

ARTC is committed to minimising the environmental impact of the proposal and is investigating opportunities to reduce actual impact areas where practicable. The area that would be directly impacted by construction would depend on factors such as presence of significant vegetation, constructability, construction management and safety considerations, landform, slopes and anticipated sub-soil structures. Direct impacts would be reduced where practicable.

There are two options to mitigate the potential impacts on artefact scatters in the proposal site. The first option is to avoid the site. Where this is not practicable, the second option is to salvage artefacts from the site prior to construction. In this instance, the collected items would be stored at an appropriate keeping place identified in consultation with registered Aboriginal parties.

For significant archaeological sites located outside the proposal site, the extent of the site would be identified with high-visibility fencing to avoid construction impacts. The sites would also be clearly marked on all mapping and plans used by construction contractors.

If impacts on Aboriginal objects are unavoidable, archaeological examination may be required to clarify the extent and nature of any subsurface deposits in consultation with relevant Aboriginal stakeholders.

There are two options to mitigate the potential impacts on areas of PADs. The first option is to modify the construction footprint so that impacts would be avoided; however, in many cases, this may not be feasible as the area of PAD is likely to continue for some distance either side of the area of potential impacts. The second option would be to undertake further archaeological examination in the form of subsurface testing. This would enable the nature and extent of archaeological deposits to be determined. If archaeological testing confirms that the PAD is a heritage site, and has the potential to be impacted by the proposal, the site would be managed in consultation with the Department of Planning, Industry and Environment and registered Aboriginal parties. Depending on the results of these investigations, it may also be necessary to undertake a program of salvage excavations at some or all of these sites.

A detailed salvage methodology would be prepared by a suitably qualified archaeologist in consultation with relevant registered Aboriginal parties. The methodology would be included in the Aboriginal cultural heritage management plan (see Table B6.7) to ensure any artefacts salvaged are managed in accordance with the requirements of the *National Parks and Wildlife Act 1974* (NSW).

Salvage excavation would be undertaken by qualified archaeologists with the participation of Aboriginal stakeholders. The aim of the salvage excavations is to identify any Aboriginal heritage objects present and, if any are found, to remove the objects from the area of potential impact. Consultation with the Aboriginal community would be undertaken regarding the salvage methodology and the process for the temporary and long-term care and management of any Aboriginal objects retrieved.

Detailed analysis and reporting of cultural material collected would be provided to the Department of Planning, Industry and Environment.

### **Approach to managing other impacts**

The potential for impacts during construction would be managed in accordance with a proposal-specific Aboriginal cultural heritage management plan, which would be prepared and implemented as part of the CEMP. The plan would detail processes, relevant requirements and responsibilities to minimise potential impacts on Aboriginal heritage during construction. It would be prepared in accordance with relevant guidelines, standards and Technical Report 6. The plan would also include the unexpected finds procedure and the proposed salvage methodology.

Further information on the CEMP is provided in chapter D5. The requirements for the Aboriginal cultural heritage management plan are provided in the CEMP outline in Appendix I.

### **Expected effectiveness**

The preferred heritage outcome is to avoid all Aboriginal cultural heritage items; however, this is not always feasible. During the development of the design, impact to Aboriginal heritage sites, places and objects was avoided where practicable but not all impacts on Aboriginal heritage can be avoided entirely as this would result in additional impacts in other areas. Therefore, further measures to mitigate impacts are required. The measures provided in Table B6.7 have been identified as an outcome of the Aboriginal heritage assessment and through considering best-practice approaches to managing potential impacts as defined by relevant heritage guidelines.

The Aboriginal cultural heritage assessment (including the proposed mitigation measures) was prepared by specialist Aboriginal heritage consultants and qualified archaeologists. As a result, the measures are expected to be effective.

The potential loss of intrinsic Aboriginal cultural value linked to these impacted sites cannot be offset; however, any salvaged material will increase understanding, strengthen interpretation, and improve ongoing and future management of Aboriginal heritage in the area. The proposed approach to management is considered to be effective in reducing the potential impacts of the proposal on Aboriginal heritage, as far as practicable, and providing for the appropriate management of Aboriginal heritage in the event that it is encountered.

The proposal has been designed to provide an important piece of national infrastructure that will provide local, state and national benefits once operational. In the context of the strategic benefit of the overall proposal, it is considered that the Aboriginal heritage impacts are acceptable.

### **Interaction between measures**

There are no expected interactions between mitigation measures for Aboriginal heritage and other measures.



## B6.5.2 List of mitigation measures

Measures that will be implemented to address potential impacts on Aboriginal heritage are listed in Table B6.7.

**TABLE B6.7 ABORIGINAL HERITAGE MITIGATION MEASURES**

Stage	Ref	Impact/issue	Mitigation measures
Detailed design, pre-construction	AH1	<i>Avoiding and minimising impacts on Aboriginal heritage</i>	<p>Detailed design and construction planning would avoid direct impacts on identified items/sites of Aboriginal heritage significance as far as reasonably practicable.</p> <p>The location of construction compounds and associated access routes would be reviewed to ensure, as far as practicable, they are not located in areas of medium or high archaeological potential.</p>
	AH2	<i>Management of salvaged items</i>	<p>A detailed salvage methodology would be prepared by a suitably qualified archaeologist in consultation with relevant registered Aboriginal parties. The methodology would be included in the Aboriginal cultural heritage management plan (mitigation measure AH8) to ensure any artefacts salvaged are managed in accordance with the requirements of the <i>National Parks and Wildlife Act 1974</i> (NSW).</p> <p>The methodology would include the process for consultation with the Department of Planning, Industry and Environment and registered Aboriginal Parties in accordance with the <i>Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW</i> (DECCW, 2010c) the <i>Aboriginal Cultural Heritage Consultation Requirements for Proponents</i> (DECCW, 2010b), and the <i>Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW</i> (OEH, 2011). It would also include requirements in relation to the management of, and care and control plans for, salvaged objects.</p> <p>Registered Aboriginal parties would be engaged to assist in the salvage, which would be managed by an appropriately qualified archaeologist engaged to support the process.</p> <p>Detailed analysis and reporting of cultural material collected would be provided to the Department of Planning, Industry and Environment.</p>
	AH3	<i>Management of salvaged items</i>	<p>A targeted archaeological survey would be undertaken for areas identified as culturally sensitive, requiring further investigation, including:</p> <ul style="list-style-type: none"> <li>▶ Wallaby Creek</li> <li>▶ Ewenmar Creek</li> <li>▶ Marthaguy Creek</li> <li>▶ Castlereagh River</li> <li>▶ Gulargambone Creek</li> <li>▶ Tenandra Creek</li> <li>▶ Baradine Creek</li> <li>▶ Namoi River.</li> </ul> <p>The additional investigation would be undertaken with registered Aboriginal parties in accordance with the <i>Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales</i> (DECCW, 2010a).</p> <p>Additional mitigation and management measures would be developed, in consultation with the registered Aboriginal parties, for areas or items of Aboriginal cultural heritage significance identified during the targeted survey. The additional measures would be included in the Aboriginal cultural heritage management plan (mitigation measure AH8).</p> <p>If additional sites or items are identified that cannot be avoided, salvage of artefacts would be undertaken prior to construction, in accordance with the salvage methodology (mitigation measure AH2).</p>

Stage	Ref	Impact/issue	Mitigation measures
Detailed design, pre-construction (continued)	AH4	<i>Management of salvaged items</i>	<p>A pre-construction survey would be undertaken to confirm the locations of the previously listed AHIMS sites that could not be located during the site survey.</p> <p>Surveys would be undertaken with registered Aboriginal parties in accordance with the <i>Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales</i> (DECCW, 2010c).</p> <p>If the sites are located, impacts would be avoided as far as practicable and protection measures put in place in accordance with the Aboriginal cultural heritage management plan (mitigation measure AH8).</p> <p>Any sites with the potential to be impacted would be managed in accordance with the salvage methodology (mitigation measure AH2).</p>
	AH5	<i>Impacts on PADs</i>	<p>Detailed archaeological investigations would be undertaken at the following six PADs that may be directly impacted by the proposal:</p> <ul style="list-style-type: none"> <li>▶ Ewenmar Creek 27-6-0036</li> <li>▶ Castlereagh River 28-4-0280 (and associated artefact scatter)</li> <li>▶ Gulargambone Creek 28-1-0060 and 28-1-0090 (and associated artefact scatters)</li> <li>▶ Calga and Looking Glass creeks 28-1-0059 (and associated artefact scatter)</li> <li>▶ Baradine Creek 19-5-0230.</li> </ul> <p>Sub-surface archaeological test excavations would be undertaken to confirm the nature (and extent, if verified) of any archaeological deposits. The test excavations would be carried out in accordance with the approved methodology prepared for the proposal.</p> <p>If test excavation confirms that the PAD has heritage significance and has the potential to be impacted by the proposal, the site would be managed in consultation with DPIE and registered Aboriginal parties. If salvage is required it would be managed in accordance with the agreed salvage methodology (mitigation measure AH2).</p>
	AH6	<i>Direct impacts on modified trees</i>	<p>Impacts on the following modified trees would be avoided as far as practicable:</p> <ul style="list-style-type: none"> <li>▶ Backwater Cowal 35-3-0175</li> <li>▶ Ewenmar Creek 27-6-0035</li> <li>▶ Boothaguy Creek 27-6-0042, 27-6-0037 and 27-6-0041</li> <li>▶ Baronne Creek 28-1-0062, 28-1-0063 and 28-1-0064</li> <li>▶ Mungery Creek 28-1-0083, 28-1-0084, 28-1-0086 and 28-1-0087.</li> </ul> <p>If impacts are unavoidable, the tree would be photographed and catalogued prior to removal, in consultation with the registered Aboriginal parties, by an appropriately qualified archaeologist.</p> <p>The salvaged artefacts would be managed in accordance with the salvage methodology.</p>
	AH7	<i>Impacts on artefact scatters</i>	<p>Surface collection (salvage) of the following artefact scatters would occur prior to construction in accordance with the approved salvage methodology:</p> <ul style="list-style-type: none"> <li>▶ Macquarie River 35-3-0276 and 35-3-0195</li> <li>▶ Castlereagh River 28-4-0280</li> <li>▶ Gulargambone Creek 28-1-0090 and 28-1-0060</li> <li>▶ Calga and Looking Glass Creek 28-1-0059 and 28-1-0095</li> <li>▶ Noonbar Creek 28-1-0096</li> <li>▶ Baradine Creek 19-5-0226</li> <li>▶ Bohena Creek 19-6-0180.</li> </ul>

Stage	Ref	Impact/issue	Mitigation measures
Construction	AH8	<i>Protecting Aboriginal heritage and minimising impacts during construction</i>	<p>An Aboriginal cultural heritage management plan would be prepared prior to construction and implemented as part of the CEMP. The plan would include measures to minimise the potential for impacts and manage Aboriginal heritage, including:</p> <ul style="list-style-type: none"> <li>▶ A salvage methodology (mitigation measure AH2)</li> <li>▶ An unexpected finds procedure (mitigation measure AH10)</li> <li>▶ Plans and installation procedures for fencing and protective coverings</li> <li>▶ Induction package for construction workers and supervisors (mitigation measure AH9)</li> <li>▶ Measures to protect sites close to the proposal site from inadvertent impacts</li> <li>▶ Outcomes of further investigations (mitigation measures AH3 and AH4).</li> </ul> <p>The plan would be prepared in consultation with registered Aboriginal parties and the Department of Planning, Industry and Environment.</p>
	AH9	<i>Protecting Aboriginal heritage and minimising impacts during construction</i>	A requirement for cultural and historic heritage awareness training would be included in the Aboriginal cultural heritage management plan. Cultural heritage awareness training would be provided by an Aboriginal representative at the commencement of substantial works for the proposal.
	AH10	<i>Unexpected finds</i>	An unexpected finds procedure would be developed and included in the Aboriginal cultural heritage management plan to provide a consistent method for managing any unexpected Aboriginal heritage items discovered during construction, including potential heritage items or objects, and human skeletal remains.
	AH11	<i>Impacts on Aboriginal cultural values at Etoo Creek 19-5-0239</i>	<p>Prior to construction commencing, and once rehabilitation is complete, a smoking ceremony would be undertaken at the location of Etoo Creek 19-5-0239.</p> <p>Prior to construction commencing, the age of the culturally modified (scarred) tree would be verified by an arborist.</p>

### B6.5.3 Managing residual impacts

Residual impacts are impacts of the proposal that may remain after implementation of:

- ▶ Design and construction planning measures to avoid and minimise impacts (see sections A7.2 and A8.1)
- ▶ Specific measures to mitigate and manage identified potential impacts (see section B6.5.2).

The key potential Aboriginal heritage issues and impacts originally identified by the environmental risk assessment (see section A9.1) are listed in Table B6.8. The (pre-mitigation) risks associated with these impacts, which were identified by the environmental risk assessment, are provided. Further information on the approach to the environmental risk assessment, including descriptions of criteria and risk ratings, is provided in section A9.1.

The potential issues and impacts identified by the environmental risk assessment were considered as part of the Aboriginal cultural heritage assessment, summarised in sections B6.3 and B6.4. The mitigation and management measures (listed in Table B6.7) that would be applied to manage these impacts are also identified. The significance of potential residual impacts (after application of these mitigation measures) is rated using the same approach as the original environmental risk assessment. The approach to managing significant residual impacts (considered to be those rated medium or above) is also described.



**TABLE B6.8 RESIDUAL IMPACT ASSESSMENT—ABORIGINAL HERITAGE**

Assessment of pre-mitigated risk (see section A9.1 and Appendix E)					Mitigation measure (see Table B6.7)	Residual impact assessment			
Phase	Potential impacts	Likelihood	Consequence	Risk rating		Likelihood	Consequence	Risk rating	How residual impacts will be managed <sup>1</sup>
Construction	Potential impacts on registered Aboriginal heritage items/sites in the proposal site	Possible	Major	High	AH1 to AH10 and AH12	Possible	Minor	Low	n/a
	Impacts on unrecorded Aboriginal sites and/or areas of archaeological sensitivity or cultural value	Possible	Major	High	AH1, AH3 to AH5, AH8 to AH11	Possible	Minor	Low	n/a
	Impacts on areas predicted to have moderate-to-high archaeological potential	Possible	Major	High	AH1, AH2 and AH8 to AH11	Possible	Moderate	Medium	Any areas identified as having heritage significance that have the potential to be impacted by the proposal would be managed in accordance with the mitigation measures. If salvage is required, it would be managed in accordance with the agreed salvage methodology.  The Aboriginal cultural heritage management plan would detail the approach to managing Aboriginal sites and would be prepared in consultation with relevant stakeholders. This would minimise the potential for residual impacts as far as reasonably practicable.

Note: 1. For residual impacts with a risk rating of medium or above.