



# Chapter 20

Aboriginal heritage



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## Chapter 20 Aboriginal heritage

The proponent recognises that the Pilliga has spiritual meaning and cultural significance for the Aboriginal people of the region. The proponent's proposed framework is that Aboriginal people assess and make decisions about their own heritage. The assessment has concluded that by application of the avoidance principle there would be no impact on cultural heritage sites that have been assessed of high significance. The assessment also concluded that in relation to Aboriginal Cultural Values the impact of the project would either be non-existent for some, minimal for others, and operate in the short to medium term to the extent that there is an impact for others.

An Aboriginal cultural heritage assessment report was prepared in accordance with the NSW Office of Environment and Heritage's (OEH) *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011) and the Secretary's environmental assessment requirements. This chapter presents a summary of the report, which is provided in full in Appendix N1.

The key findings of the impact assessment in relation to Aboriginal heritage were:

- The project area contains 90 known Aboriginal cultural heritage sites and is likely to contain additional sites that are not yet identified.
- The project would completely avoid highly significant sites and all 90 known sites within the project area.
- The Cultural Heritage Management Plan outlines the process for pre-clearance surveys and for the management of new finds discovered during carrying out of project activities.
- The proposed approach to avoiding and minimising impact on cultural heritage, including a process involving representatives of the local Aboriginal community in systematic pre-clearance surveys, has already been tested and found to be effective.
- Avoidance and management commitments made in the Cultural Heritage Management Plan would also be referenced in the Field Development Protocol which would set out the detailed environmental criteria and locational principles for site selection of field infrastructure within the project area.
- The offsets program would provide new conservation opportunities and Aboriginal involvement, reducing the risk of impacts on cultural heritage values.

The *National Parks and Wildlife Act 1974* is the primary legislation for the protection of Aboriginal cultural heritage in NSW. The Act defines 'Aboriginal cultural heritage' as 'Aboriginal objects' (including Aboriginal remains) and 'Aboriginal places'.

Consultation in accordance with the OEH *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010) is well advanced. To date, there are over 550 Registered Aboriginal Parties. Consultation has included distribution of project material, community meetings, site visits, and review opportunities on the draft Aboriginal cultural heritage assessment report and Cultural Heritage Management Plan.

The project area contains 90 known Aboriginal cultural heritage sites (these were identified from a variety of data sources) and is likely to contain additional sites that are not yet identified. Initial field verification was undertaken at 26 of these sites within the project area. The remaining sites would be verified within one year of project approval and updated in the project geographic information system (GIS) database.

Without appropriate management, potential impacts on Aboriginal heritage are most likely to occur during construction of the project. However, as the siting of field infrastructure is flexible, an avoidance principle and precautionary principle for the protection of Aboriginal cultural heritage can be implemented. This would include the complete avoidance of highly significant sites and all 90 known sites within the project area. Specific objective conditions would be implemented for those categories where avoidance may not be possible. Implementation of the precautionary principle would result in actions that are reasonable and practicable to minimise harm to known Aboriginal objects, and / or identifying Aboriginal objects so they can be reasonably managed. This process is outlined in the Cultural Heritage Management Plan for the project (refer to Appendix N2). The avoidance and precautionary principles were tested as part of previous assessments at Leewood and Bibblewindi. The pre-clearance surveys identified four Aboriginal cultural heritage sites at Leewood. The avoidance principle was implemented, including the fencing of the sites, to ensure there was no impact during project activities. These studies confirmed that a process involving representatives of the local Aboriginal community, systematic pre-clearance surveys, and application of the avoidance and precautionary principle as management tools was feasible and effective in the context of this project.

Avoidance and management commitments made in the Cultural Heritage Management Plan for the project (refer to Appendix N2) would also be included in the Field Development Protocol (refer to Appendix C) which would set out the detailed environmental criteria and locational principles that are being used for site selection of field infrastructure within the project area.

The procedure for the management of new finds, discovered during the course of undertaking project activities, is also outlined in the Cultural Heritage Management Plan and would initially involve stopping work in the area of the new find and securing the area until the appropriate management measures can be agreed, documented and implemented. The measures for dealing with a new find would also be consistent with the Cultural Heritage Management Plan.

A research program would be implemented to confirm existing data sets and provide further information to guide the development of the project. The methodology for the research program would be developed in consultation with the Registered Aboriginal Parties. The cultural heritage zoning scheme and sensitivity mapping developed for the project would continue to be updated, with the results of the additional research and site verification to further guide the development of the project and siting of field infrastructure.

## 20.1 Methodology

The Aboriginal cultural heritage assessment included:

- Aboriginal consultation in accordance with the OEH *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010)
- a data audit, which involved a search of the Aboriginal Heritage Information Management System (AHIMS), review of additional data held by OEH Narrabri Local Aboriginal Land Council (LALC), and databases established by Eastern Star Gas; a literature review and reviews of previous studies, including oral histories and Brigalow Belt studies
- site verification, which involved field surveys to validate data for existing known sites
- landscape sensitivity mapping and Aboriginal cultural heritage zoning
- preparation of a Cultural Heritage Management Plan.

These steps are described in more detail below.

## 20.1.1 Aboriginal consultation

Consultation is well advanced. There are four stages of consultation.

Stage 1 involves compiling a list of Aboriginal people who may have an interest in the project area. The following activities have been completed:

- letters were sent to all relevant agencies in April 2014 requesting nominations for Register Aboriginal Parties
- an advertisement seeking that parties nominate as Registered Aboriginal Parties was placed in the *Narrabri Courier* newspaper in April 2014
- a response period to advertising and correspondence was provided in June 2014.

To date, there are over 550 Registered Aboriginal Parties, including the registered native title applicant for the Gomeroi Applicant native title claim (Federal Court proceeding NSD2038 / 2011), Narrabri LALC, Wee Waa LALC and Red chief LALC; other organisations and numerous individuals. Correspondence was provided to all parties in June and August 2014. A full list of Registered Aboriginal Parties is included in Appendix N1.

Stage 2 and 3 involves the proponent presenting and / or providing information about the proposed project to Registered Aboriginal Parties, and the proponent presenting and / or providing the proposed methodology / methodologies for the cultural heritage assessment to the Registered Aboriginal Parties for comment. The following activities have been completed:

- three meetings were held between 2 and 4 September 2014 in Wee Waa, Narrabri and Gunnedah. All Registered Aboriginal Parties received written invitations to attend these meetings. Additional project information was provided at meetings
- additional project information was provided to all Registered Aboriginal Parties in early September 2014
- the proposed methodology for the assessment was presented
- all issues raised for consideration at meetings were noted. A register of issues and responses was established (and has continued to be expanded as additional meetings have been held and further comments received)
- a second series of meetings was held in Gunnedah, Wee Waa and Narrabri from 15 to 17 September 2014. A field trip was also undertaken on 17 September 2014 with Registered Aboriginal Parties
- the 28-day comment period for the assessment methodology closed on 7 October 2014. A register of the submissions issues and responses is provided in Appendix N1
- discussions were held with the Gomeroi Applicant.

Stage 3 involves the proponent presenting and / or providing the proposed methodology / methodologies for the cultural heritage assessment to the Registered Aboriginal Parties for comment. During Stage 3, the methodology for the assessment was presented at a meeting in Wee Waa on 2 September and issued to Registered Aboriginal Parties on 5 September 2014.

Stage 4 involves the proponent preparing a draft cultural heritage assessment report and providing it to the Registered Aboriginal Parties for review and comment. The following activities have been completed:

- the draft assessment report and the draft Cultural Heritage Management Plan were presented to Registered Aboriginal Parties on 18 November 2014. Copies of the Aboriginal cultural heritage assessment report and the Cultural Heritage Management Plan were issued to the Registered Aboriginal Parties
- additional meetings were held in Wee Waa, Narrabri and Gunnedah on 9 and 10 December 2014
- all issues and responses were documented (refer to Appendix N1).

The Aboriginal consultation process for the project is ongoing. Consultation, including Aboriginal consultation, is also discussed in Chapter 9.

### 20.1.2 Data audit

Data were reviewed for an area that is termed the 'data audit area'. The data audit area relates to an area of 203,163 hectares (2,031.6 square kilometres), which totally surrounds, and includes, the project area. The project area constitutes 46.9 per cent of the data audit area. This is shown in Figure 20-1.

The aim of the data audit was to:

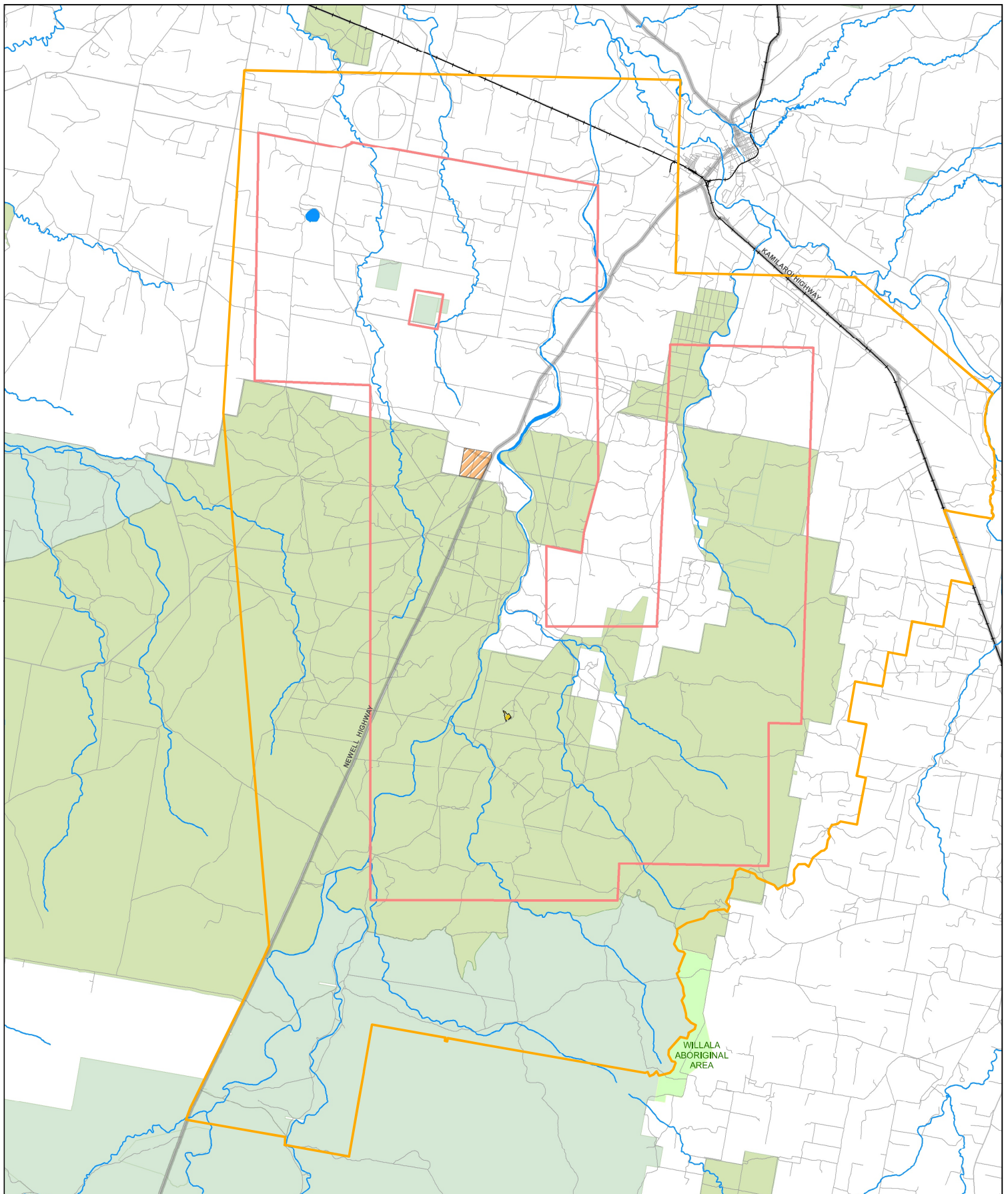
- establish a single site datum for all sites
- determine the number and types of sites found in the data audit area
- determine the number of AHIMS registered sites in the data audit area
- determine locations where fieldwork has been undertaken
- determine the quality of the site locational data
- determine what size site buffers would be required to give effect to the avoidance and precautionary principles.

A critical review of the data was undertaken to determine if there were duplicates in identified sites, inaccuracies in the data site location information, and / or errors in data sets. This information is captured in the project GIS database.

Buffers were then applied to Aboriginal cultural heritage sites as follows:

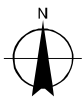
- AHIMS sites lacking contextual information – 100 metres from the site location registered in AHIMS
- all other sites – a graduated buffer based on the type of site and values adhering to it. The buffer applies either to the site location cited or to the boundary of the site where extent has been provided or generated. These are as follows:
  - 20 metres around isolated stone artefact / s
  - 40 metres around stone artefact scatters
  - 50 metres around places including scarred trees, resource places, rock shelters / caves, hearths and general historic places (such as camps)
  - 75 metres around grinding grooves
  - 100 meters around places including those associated with Aboriginal ceremony (such as stone arrangements and rings) and burials, as well as the considerably undefined places identified as being an ochre source and containing shell.





- LEGEND**
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|--|--|---|
| <span style="border: 1px solid red; display: inline-block; width: 15px; height: 10px;"></span> Project area                            | <span style="background-color: blue; display: inline-block; width: 15px; height: 10px;"></span> Lakes and dams | <span style="border: 2px solid orange; display: inline-block; width: 15px; height: 10px;"></span> Data audit area |
| <span style="background-color: orange; display: inline-block; width: 15px; height: 10px;"></span> Leewood                              | <span style="border-bottom: 1px solid blue; display: inline-block; width: 15px;"></span> Watercourses          | <span style="border-bottom: 1px solid grey; display: inline-block; width: 15px;"></span> Roads                    |
| <span style="background-color: yellow; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Bibblewindi | <span style="border-bottom: 1px solid black; display: inline-block; width: 15px;"></span> Train line           |   |
| <span style="background-color: lightgreen; display: inline-block; width: 15px; height: 10px;"></span> Parks and reserves               |  |   |
| <span style="background-color: green; display: inline-block; width: 15px; height: 10px;"></span> State forest                          |  |   |
| <span style="background-color: lightgreen; display: inline-block; width: 15px; height: 10px;"></span> Aboriginal areas                 |  |   |

0 2.5 5 10  
Kilometers



Narrabri Gas Project  
Environmental Impact Statement

Job Number	21-22463
Revision	A
Date	25 Jul 2016

Data audit area

Figure 20-1

N:\AU\Sydney\Projects\2122463\GIS\Map\21\_22463\_KBM29\_mxd [KBM: 200]

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydney@ghd.com.au W www.ghd.com.au  
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Data source: NSW Department of Lands: DTDB and DCDB - 2012-13; Santos: Operational and Base Data - 2013. Created by: richardson

### 20.1.3 Brigalow Belt South Bioregion study and oral history

The Brigalow Belt South Bioregion study and oral history (RACAC 2002) contains large amounts of information that is directly pertinent to the project area.

The study recorded and transcribed 110 oral history interviews, retrieved and researched numerous documents highlighting Aboriginal association with forests, travelling stock reserves, station properties and towns; located and recorded Aboriginal sites; and documented 60 traditionally used plant species.

A large component of this report consisted of transcribed interviews with Aboriginal people. The study captured information that helps to highlight and understand the cultural affinity of Aboriginal people to the area covered by the Brigalow Belt South bioregion. This includes places of traditional uses, association and cultural significance of the Pilliga Forest. It also considers culturally useful plants within the Pilliga.

Culturally sensitive information was not directly sought. However, the study has resulted in a great deal of information, of considerable value, on a wide range of issues that are of direct relevance to this project. A summary of the oral history transcripts is provided in Section 4.5 of Appendix N1.

Sensitive landforms described in the Aboriginal Cultural Heritage Assessment for the Brigalow Belt South Bioregion were also considered in the landscape sensitivity mapping for the project as discussed in 20.1.5.

### 20.1.4 Site verification and field surveys

Due to the size of the project area, and considering that the location of field infrastructure would be flexible and would be determined during field development, the field survey effort focussed on verifying existing Aboriginal cultural sites within the data audit area that were identified during the data audit process.

To determine which sites would be selected for field verification, a pilot program for the field survey effort was developed and initiated. The pilot program selected 50 sites for site verification within the data audit area, which are listed in Table 20-1. Of these 50 sites, 26 were within the project area, two were on the boundary of the project area and 22 were outside the project area (refer to Table 20-4). Sites chosen for verification included sites from a variety of data sources, all the major place types, and sites across a broad geographical spread.

A team consisting of one technical adviser, four Aboriginal field officers (from Narrabri LALC and the Gomeroi Applicant) and two project representatives spent nine days in the field in July 2014. All field assessment work was undertaken by suitably qualified personnel and informed by the provisions of the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010b).

The field survey allowed for a buffer of approximately 100 metres for locational error. If the site was identified in a different location to that previously recorded, the correct location was recorded using differential GPS. Site attributes and conditions were also captured with a photographic record, which was also linked to the project GIS.

Table 20-1 Aboriginal cultural heritage sites within the data audit area subject to site verification

Place no.	Place type	Place name / summary ID	AHIMS ID	Source
1	Stone artefact scatter	Pilliga SF; Bohena CDA4	-	BBS
3	Isolated stone artefact	Pilliga SF; Bohena CDA6	-	BBS
5	Isolated stone artefact	Pilliga East SF; Bohena CDA1	19-6-0036	AHIMS & BBS
6	Isolated stone artefact	Pilliga SF; Bohena CDA2	-	BBS
13	Stone artefact scatter	Pilliga East SF; Borah CDA2	19-6-0034	AHIMS & BBS
18	Stone artefact scatter	Pilliga SF; Bundock CDA1	-	BBS
20	Isolated stone artefact	Pilliga SF; Bundock CDA3	-	BBS
57	Stone artefact scatter	Pilliga SF; Goona CDA3	-	BBS
63	Historic camp	Sid Ruttleys Camp Historical Site	19-3-0072	AHIMS & BBS
195	Isolated stone artefact	Pilliga SF – Jacks Creek 2 (8)	-	BBS
198	Hearth	Pilliga SF – Jacks Creek 2 (11)	-	BBS
203	Historic burial	Trindal Oral History Sulky Story – B	-	BBS
205	Resource place	Trindal Oral History Sulky Story – D	-	BBS
213	Historic burial	Trindal Oral History Sulky Story – L	-	BBS
214	Historic camp	Trindal Oral History Sulky Story – M	-	BBS
216	Historic camp	Trindal Oral History Sulky Story – O	-	BBS
330	Stone artefact scatter	Sandy CDA4	-	BBS
331	Stone artefact scatter	Sandy CDAN1	-	BBS
341	Grinding grooves	Stage 1 Remnants	-	BBS
345	Isolated stone artefact	Spring CDA1	-	BBS
358	Rock shelter / stone artefact scatter	Sandy CDA North RS1	-	BBS
383	Scarred tree	PFST2	-	AECOM 2011
384	Stone artefact scatter	Cowallah Ck AS1	-	AECOM 2011
392	Scarred tree	Cowallah Ck ST3	-	AECOM 2011
398	Stone artefact scatter	Bohena Ck AS4	-	AECOM 2011
403	Scarred tree	Bohena Ck ST6	-	AECOM 2011
408	Scarred tree	RESTRICTED	19-6-0045	AHIMS
409	Scarred tree	Yarrie Lake recreation area 2	19-3-0028	AHIMS
411	Stone artefact scatter	Yarrie Lake recreation area 21	19-3-0047	AHIMS
412	Grinding grooves	Biblewindi State Forest; Womba	19-6-0014	AHIMS
413	Hearth	Rutherfords Creek-cluster 11(18041)	19-6-0039	AHIMS
414	Grinding grooves	Grinding Grooves #1 PNR Sandy Creek off Delwood Road	19-6-0040	AHIMS
415	Grinding grooves	Sandy Creek Grooves 1	19-6-0062	AHIMS

Place no.	Place type	Place name / summary ID	AHIMS ID	Source
416	Isolated stone artefact	Sandy Creek Grinding Dish 1	19-6-0094	AHIMS
419	Ochre source	OMPSS1	19-6-0060	AHIMS
420	Scarred tree	Borah Creek Double Scar Tree 1	19-6-0065	AHIMS
422	Scarred tree	Yarrie Lake recreation area 5	19-3-0031	AHIMS
424	Stone artefact scatter	Yarrie Lake recreation area 19	19-3-0045	AHIMS
425	Stone artefact scatter	Turalin; Narrabri	19-3-0001	AHIMS
426	Scarred tree	Yarrie Lake recreation area 12	19-3-0038	AHIMS
430	Ceremonial ring / scarred tree	Bohena Creek; Brigalow Creek	19-3-0005	AHIMS
431	Scarred tree	Yarrie Lake recreation area 14	19-3-0040	AHIMS
435	Stone artefact scatter	WN18 Narrabri	19-3-0017	AHIMS
438	Scarred tree	Wee Waa LALC; Federal Land 1	19-3-0064	AHIMS & BBS
439	Aboriginal ceremony and dreaming / historic burials	Dangar Village, Old Mission Cemetery	19-3-0003	AHIMS
441	Stone artefact scatter	WN22 Narrabri	19-3-0014	AHIMS
442	Stone artefact scatter	WN20 Narrabri	19-3-0018	AHIMS
445	Scarred tree	Yarrie Lake recreation area 9	19-3-0035	AHIMS
449	Stone artefact scatter	Wee Waa LALC; Federal Land 2	19-3-0065	AHIMS & BBS
573	Scarred tree	Tree B	-	RPS scout

At the time of preparation of this assessment, field surveys were also being undertaken at Leewood and Bibblewindi as part of separate planning approvals projects. These surveys adopted avoidance and precautionary principles, similar to what would be adopted for this project. The results of these studies are discussed further in Section 20.2.3 and 20.3.1.

### 20.1.5 Landscape sensitivity mapping and Aboriginal cultural heritage zoning

The aim of landscape sensitivity mapping was to identify cultural sites and practices and communicate to stakeholders that cultural protection aims to consider more than just protecting individual sites, as sites need to be considered in a landscape context. Cultural landscape mapping is an important way to communicate how Aboriginal people used, and continue to use, the land. This increases cultural awareness and understanding, and improves cultural heritage management.

A model of the data audit area was created using geomorphic landforms described in the Aboriginal cultural heritage assessment for the Brigalow Belt south bioregion (RACAC 2000), including such things as watercourses and their stream order category, and soil types (refer to Appendix I1). It also included the results of the data audit and site verification. The digital data of those landforms and known Aboriginal cultural heritage was loaded into the GIS database for the project.

To facilitate the application of appropriate management measures, buffer zones were included in the model. The buffers were applied depending on the sensitivity of the site and the accuracy of data information.

The model generated a number of different cultural heritage zones across the project area, depending on the sensitivity of the different landscapes (discussed in Section 20.2.4). The model allows landscape sensitivity mapping to be produced, illustrating the different cultural heritage zones. The model and mapping can then be used to inform project planning for the field infrastructure.

The analysis did not consider static water bodies such as billabongs or lakes as there is no data set with sufficient detail containing this information. An exception to this is Yarrie Lake, which has a 200 metre buffer.

## 20.1.6 Aboriginal Cultural Heritage Management Plan

A Cultural Heritage Management Plan was developed in consultation with the Registered Aboriginal Parties. It specifies the procedures that the proponent would implement as part of the management of the project in order to protect and manage cultural heritage. The full plan is attached in Appendix N2 and a summary is provided in Chapter 30 (Environmental management and monitoring).

## 20.2 Existing environment

### 20.2.1 Background

There are two LALCs within the project area—the Narrabri LALC and Wee Waa LALC. The project area also falls within the area subject to the registered native title claim by the Gomeroi Applicant (Federal Court proceeding NSD2038 / 2011). The claim has not yet been determined.

Aboriginal cultural heritage in the Pilliga has suffered from four major land use impacts stemming from European occupation; being:

- large-scale clearing for agricultural purposes resulting in removal of scarred trees and culturally important plants and animals or destruction of archaeological sites
- grazing animals impacting on watercourses or trampling Aboriginal sites / objects
- timber-getting, resulting in removal of scarred trees
- changes in fire regime resulting in loss of mosaic environment and more intense fires destroying scarred trees.

European settlement has also resulted in impacts on the Aboriginal community, with a shift from an independent hunter-gatherer lifestyle to integration into the regional rural economy.

## 20.2.2 Aboriginal heritage sites

### AHIMS sites

There are 176 AHIMS sites in the entire data audit area (which also encompasses the project area). Two of these sites are restricted files – one scarred tree and one isolated stone artefact.

There are 24 registered AHIMS sites within the project area. These sites are:

- 14 scarred trees
- five stone artefact scatters
- four isolated stone artefacts
- one grinding groove.

According to AHIMS, all of these sites are 'valid'. This means they still exist *in situ*.

It is generally understood that the AHIMS register does not constitute a realistic estimate of the cultural heritage sites that probably exist within the project area. This is because the majority of the project area has not been previously subject to field survey. However, the data audit provides a good indication of the types of sites that exist within that area.

The assessments of significance of cultural heritage sites / places, both potential and realised, are fundamental to the Cultural Heritage Management Plan. The significance of these sites / places is usually assessed in terms of the following criteria:

- scientific
- social
- historical
- educational and economic
- aesthetic.

Each of these significance criteria can be assigned a relative value from low to very high at the regional, state or national level. This process of significance assessment forms the basis of the Burra Charter (Australian ICOMOS charter for the conservation of places of cultural significance) which is employed nationally by heritage consultants and by the Australian Heritage Commission in Canberra.

A summary of the significance of cultural heritage site types within the project area is provided in Table 20-2. The Aboriginal cultural heritage report in Appendix N1 provides additional commentary on the significance of each cultural heritage place or value.



Table 20-2 Summary of significance assessment of cultural heritage site types within the project area

Place or value	Significance <sup>a</sup>				
	Scientific	Social	Historical	Education/ economic	Aesthetic
Stone artefact concentrations	M-H	M-H	NA	L-H	NA
Grinding equipment and ground-edge tools	M-H	H	NA	M-H	NA
Grinding grooves	M-H	H	NA	M-H	NA
Isolated stone artefacts	L-H	M-H	NA	M-H	NA
Scarred trees	L-H	H	L-H	M-H	L-H
Quarries	M-H	H	NA	M-H	NA
Hearths and ovens	M-H	H	P	M-H	NA
Burials	M-H	H	P	M-H	P
Mounds	M-H	H	NA	M-H	P
Recent historic and contact sites	M-H	H	H	M-H	P
Rock shelters	H	H	P	H	L-H
Rock art	H	H	P	H	M-H
Shell middens	H	M-H	P	M-H	NA
Stone arrangements and earthen circles	H	H	P	H	P
Aesthetic value of forest	NA	H	NA	NA	H
Educational value of the forest	NA	H	NA	H	NA
Carved trees	H	H	P	H	H
Places of traditional and anthropological significance	H	H	P	H	L-H
Cultural use of traditional resources	H	H	NA	H	NA

<sup>a</sup> NA = not applicable, P = possible, H = high, M = medium, L = low

## Other Aboriginal cultural heritage sites in the data audit area

The data audit review identified a total of 268 individual cultural heritage sites within the data audit area of which 176 comprised AHIMS sites. Of these 268 cultural heritage sites, 90 sites are located within the project area (including the 24 AHIMS sites). Table 20-3 shows a breakdown of the different Aboriginal site types in the data audit area and the project area.

Table 20-3 Types and number of sites identified in the data audit area and project area

Place type	Entire data audit area		Project area	
	Number	Percentage (%)	Number	Percentage (%)
Stone artefact scatter	121	45.1	17	18.9
Isolated stone artefact	81	30.2	31	34.4
Scarred tree	39	14.6	34	37.8
Grinding grooves	6	1.9	1	1.1
Historic camp	5	1.9	1	1.1
Hearth	3	1.1	1	1.1
Historic burial	2	0.7	1	1.1
Other historic place	2	0.7	1	1.1
Resource place	2	0.7	2	2.2
Aboriginal ceremony/historic burials	1	0.4	-	-
Ceremonial ring/scarred tree	1	0.4	-	-
Ochre source	1	0.4	-	-
Rock shelter/cave	1	0.4	-	-
Rock shelter / stone artefact scatter	1	0.4	1	1.1
Shell	1	0.4	-	-
Stone arrangement	1	0.4	-	-
<b>Total</b>	<b>268</b>		<b>90</b>	

As noted in Section 20.1, the data audit process identified where multiple recordings of cultural heritage sites occur, and removed the duplication from the data sets. Where it was not possible to do this with certainty, the data was still included as separate recordings; this has resulted in an over-estimate of site numbers (for the data reviewed). Four of these sites have multiple values (for instance, one site is a ceremonial ring with scarred trees). The results also demonstrate that there is a high diversity of site types in the data audit area and a wide range of activities taking place.

For sites with multiple recordings, the most recent locational data was used, except in the instance where that recording was an AHIMS site. In these instances, the AHIMS site location was used.

A comparison of this data in relation to previous field survey that has been completed in the data audit area identified that eight of the sites (about 10 per cent) actually fall within a nominated field survey location. A further 25 sites fall within about 50 metres of a nominated field survey location. At this level of analysis, 33 of 77 sites (43 per cent) lie within about 50 metres of a nominated field survey location. The AHIMS sites have not been factored into this analysis as data for the fieldwork effort is not available.

There is potential for some inaccuracy with site location data due to errors when entering data or use of different technology and GPS systems. Site buffers have therefore been applied to take this into consideration until further site verification can be undertaken (refer to Section 20.1).

While a considerable number of archaeological sites were recorded in the field survey area, places of traditional, anthropological, historical and contemporary significance to Aboriginal people are likely to be under-represented.



The types of sites recorded within the data audit area and the project area generally reflect where previous survey effort was conducted, rather than the likelihood of that site occurring in abundance in a particular area. For example, one large cultural heritage study (Appleton 2009) on the grazing land immediately east of the Pilliga Forest recorded a large number of stone artefacts in this particular area but did not indicate a substantially different cultural signature between the other nearby areas.

Scarred trees have been recorded most commonly along the major watercourses such as the Bohena, Cowallah and Bundock creek systems, although examples have also been identified in other contexts. A large number have been identified in the remnant timbered country surrounding Yarrie Lake, but also in other areas such as timbered road reserves.

Places containing grinding grooves seem considerably more prevalent (between two and three times) in the areas immediately surrounding the project area than within it— where only one example is currently recorded.

Using data collated as part of the Brigalow Belt South Bioregion (RACAC 2002), all plants identified as being of cultural value were listed. At least 63 plants of cultural value were identified in the project area.

### 20.2.3 Site verification and field survey

Of the 50 sites nominated for the pilot program for site verification, 45 were subject to site verification through field survey effort (five sites could not be inspected due to weather and access conditions). Results of the site verification program are provided in Table 20-4. The summary of results is as follows:

- nine of the sites matched their description and location record
- six sites had a minor variation in description but matched their location
- three sites had a major variation in description but matched their location
- seven sites matched their description but there was a minor variation in location (by definition less than 100 metres but typically much less than this)
- seventeen sites were not present at their previously recorded location or within 100 metres of the location
- three sites were considered to be a new site or AHIMS amendment where both the location and the description varied to such an extent that either a new site was found or significant amendments to AHIMS would be required.

Table 20-4 Results of the site verification program

Place no.	Place type	Location	Results
1	Stone artefact scatter	Project area	Not present at the location or within 100 m. Nothing else identified.
3	Isolated stone artefact	Project area	Not present at the location or within 100 m. Nothing else identified.
5	Isolated stone artefact (AHIMS)	Project area	Minor variation in description but a match for location.
6	Isolated stone artefact	Project area	Minor variation in description but a match for location.
13	Stone artefact scatter (AHIMS)	Outside project area	Minor variation in description but a match for location.

Place no.	Place type	Location	Results
18	Stone artefact scatter	Project area	Not present at the location or within 100 m. Nothing else identified.
20	Isolated stone artefact	Outside project area	Not present at the location or within 100 m. Nothing else identified.
57	Stone artefact scatter	Outside project area	Major variation in description but match for location.
63	Historic camp (AHIMS)	Outside project area	Not present at the location or within 100 m. Nothing else identified.
195	Isolated stone artefact	Project area	Not present at the location or within 100 m. Nothing else identified.
198	Hearth	Eastern boundary of project area	Not present at the location or within 100 m. Nothing else identified.
203	Historic burial	Project area	Description and location matched record.
205	Resource place	Project area	Not present at the location or within 100 m. Nothing else identified.
213	Historic burial	Outside project area	Not able to be inspected due to rain.
214	Historic camp	Outside project area	Not able to be inspected due to rain.
216	Historic camp	Project area	Description and location matched record.
330	Stone artefact scatter	Outside project area	Not present at the location or within 100 m. Nothing else identified.
331	Stone artefact scatter	Eastern boundary of project area	Major variation in description but match for location.
341	Grinding grooves	Outside project area	Description and location matched record.
345	Isolated stone artefact	Project area	Not present at the location or within 100 m. Nothing else identified.
358	Rock shelter / stone artefact scatter	Project area	Minor variation in description but a match for location.
383	Scarred tree	Project area	Description and location matched record.
384	Stone artefact scatter	Project area	Minor variation in description but a match for location.
392	Scarred tree	Project area	Description and location matched record.
398	Stone artefact scatter	Project area	Minor variation in description but a match for location.
403	Scarred tree	Project area	Description and location matched record.
408	Scarred tree (AHIMS)	Outside project area	Description match with minor variation in location.
409	Scarred tree (AHIMS)	Project area	Description match with minor variation in location.
411	Stone artefact scatter (AHIMS)	Project area	Not present at the location or within 100 m. Nothing else identified.
412	Grinding grooves (AHIMS)	Project area	Not present at the location or within 100 m. Nothing else identified.

Place no.	Place type	Location	Results
413	Hearth (AHIMS)	Outside project area	Not present at the location or within 100 m. Nothing else identified.
414	Grinding grooves (AHIMS)	Outside project area	New site or AHIMS amendment required. Location and description varied significantly, meaning either new site found or AHIMS amendment required.
415	Grinding grooves (AHIMS)	Outside project area	Description and location matched record.
416	Isolated stone artefact (AHIMS)	Outside project area	Description match with minor variation in location.
419	Ochre source (AHIMS)	Outside project area	New site or AHIMS amendment required. Location and description varied significantly, meaning either new site found or AHIMS amendment required.
420	Scarred tree (AHIMS)	Outside project area	Description and location matched record.
422	Scarred tree (AHIMS)	Project area	Description match with minor variation in location.
424	Stone artefact scatter (AHIMS)	Project area	Major variation in description but match for location.
425	Stone artefact scatter (AHIMS)	Outside project area	Not present at the location or within 100 m. Nothing else identified.
426	Scarred tree (AHIMS)	Project area	Description match with minor variation in location.
430	Ceremonial ring / scarred tree (AHIMS)	Outside project area	Not able to be inspected due to rain.
431	Scarred tree (AHIMS)	Project area	Not present at the location or within 100 m. Nothing else identified.
435	Stone artefact scatter (AHIMS)	Project area	Not present at the location or within 100 m. Nothing else identified.
438	Scarred tree (AHIMS)	Outside project area	Description and location matched record.
439	Aboriginal ceremony and dreaming/historic burials (AHIMS)	Outside project area	Not present at the location or within 100 m. Nothing else identified.
441	Stone artefact scatter (AHIMS)	Outside project area	Not able to be inspected due to rain.
442	Stone artefact scatter (AHIMS)	Outside project area	Not able to be inspected due to rain.
445	Scarred tree (AHIMS)	Project area	Description match with minor variation in location.
449	Stone artefact scatter (AHIMS)	Outside project area	New site or AHIMS amendment required. Location and description varied significantly, meaning either new site found or AHIMS amendment required.
573	Scarred tree	Project area	Description match with minor variation in location.

## Field survey in the project area as part of other studies

Three areas within the project area have recently been subject to field survey as part of other studies and planning approvals—Leewood, Bibblewindi, and the Bibblewindi to Leewood infrastructure corridor. These are discussed below.

The Leewood and Bibblewindi studies confirmed that a process that directly involves representatives of the local Aboriginal community, with field surveys, and application both of the avoidance and precautionary principles as standard management tools, is feasible in the context of this project.

### Leewood

A field survey was undertaken at Leewood on 10 to 11 April 2014. The Gomeroi Applicant and Narrabri LALC nominated two representatives each for the cultural heritage survey team.

Eight transects were designed consisting of an outward leg and a return leg with each transect line designed to cover a width of 100 metres per leg. The total planned length of transects to be walked was 14.5 kilometres for an area of approximately 1.2 square kilometres.

During the field survey, four cultural heritage sites were recorded. These included two stone artefacts made with quartz and two scarred trees. Details of these Aboriginal objects are included in Table 20-5.

**Table 20-5** Cultural heritage sites recorded at Leewood during previous assessments

Site ID	Date recorded	Site type	Extent	Notes
1	10/04/2014	Isolated stone artefact/s	NA	Single unmodified quartz flake
2	11/04/2014	Isolated stone artefact/s	NA	Single unmodified quartz flake
3	11/04/2014	Scarred tree	1.4 by 0.25 metres	Live standing grey box, single scar, regrowth 0.3 metres across scar
4	11/04/2014	Scarred tree	1.9 by 0.5 metres	Live standing grey box, single scar, 1 metre girth

The activities at Leewood were able to progress based on avoidance of the sites as follows:

- The scarred trees were in a zone at the northern end of Leewood previously identified not to be impacted to protect native vegetation. The site was already fenced.
- The isolated stone artefact (quartz) flakes could be avoided by installation of fencing around each location to ensure no disturbance of those areas was to occur during project activities.

### *Bibblewindi*

Extensive surveys were completed as part of the assessment of the pilot well program at Bibblewindi (refer to Table 2-1).

Field surveys were conducted in October 2013, March 2014 and May 2014. The majority of the field survey was undertaken in October 2013 and access corridors were finalised in March 2014 and May 2014 (refer Appendix N1).

During the October 2013 fieldwork the field team consisted of three people: the technical adviser and two experienced Gomeri Applicant field officers (a project representative accompanied the team on the first day). The survey was conducted by walking a transect pattern at the nominated well pad site to ensure systematic coverage. Each transect was designed to cover a 20 metre width. Due to previous clearing and the resultant thick regrowth, it was not possible to walk the planned survey transects. In these cases, the planned transects were examined as closely as possible with some diversions to avoid the dense vegetation, to the point of impenetrable, thickets of regrowth. The diversions were recorded using a global positioning system (GPS).

In examining these pilot wells and associated access corridors, approximately 29 kilometres of transects were walked in the Bibblewindi area or the near vicinity.

Repeated blocks of fieldwork were required due to revised plans being developed for these locations. While the revised plans required inspection of new areas, they also resulted in a reduction in the areas to be affected by the proposed works. This means that the coverage achieved by the field team in relation the area to be affected, increased as a result of the re-design.

No Aboriginal heritage sites were recorded in the course of these inspections.

### *Bibblewindi to Leewood infrastructure corridor*

The Bibblewindi to Leewood underground infrastructure corridor hosts existing and approved infrastructure, including an existing gas pipeline, an existing water pipeline, and an approved (though not yet constructed) second water pipeline. No Aboriginal cultural heritage sites have been found on the existing alignment.

As part of this project, the proponent would seek to locate a third water pipeline, an intermediate gas pipeline, 132 kilovolt power transmission, and communication lines. The existing 12-metre-wide right-of-way corridor would be widened to 30 metres to accommodate construction of the new infrastructure. There are some areas within this widened infrastructure corridor that have not yet been surveyed and would be included as part of the pre-clearing survey requirements.

## 20.2.4 Landscape sensitivity mapping and Aboriginal heritage zones

The landscape model generated nine Aboriginal cultural heritage zones within the project area. These Aboriginal cultural heritage zones have been developed conservatively and include buffers depending on the sensitivity of the site and the accuracy of data information. For example, the AHIMS sites (in the Zone 1 area) have been given substantial buffers to allow for the level of uncertainty associated with current knowledge of these places, their location, values and extent.

There are three Aboriginal cultural heritage zones within the project area as follows:

- Zone 1 – identified Aboriginal cultural heritage – is based on the 268 individual sites identified during the data audit. Zone 1 has two sub-zones:
  - zone 1a – all places currently on AHIMS plus a 100 metre buffer
  - zone 1b – all other sites (not listed on AHIMS) with a buffer applied based on the type of site and values adhering to it (refer Section 20.1.2).
- Zone 2 – previously surveyed and / or developed areas – based on data from a number of sources (refer to Appendix N1) that have been the subject of Aboriginal cultural heritage survey and assessment. These areas were subsequently developed as part of previously approved projects. Zone 2 therefore represents areas where Aboriginal cultural heritage survey and assessment have been undertaken but within which no Aboriginal cultural heritage has been identified.
- Zone 3 – Aboriginal cultural heritage sensitivity – mapped with consideration of a number of landscape features including watercourses and soils in the data audit area. Zone 3 has six sub-zones:
  - zones 3a to 3e – areas identified as having Aboriginal cultural heritage sensitivity from very high (zone 3a) to very low (zone 3e)
  - zone 3f – four small portions of the study area for which information was not sufficient to make an adequate assessment of its likely sensitivity with respect to Aboriginal cultural heritage.

The Aboriginal cultural heritage zoning scheme is illustrated in the sensitivity mapping in Figure 20-2.

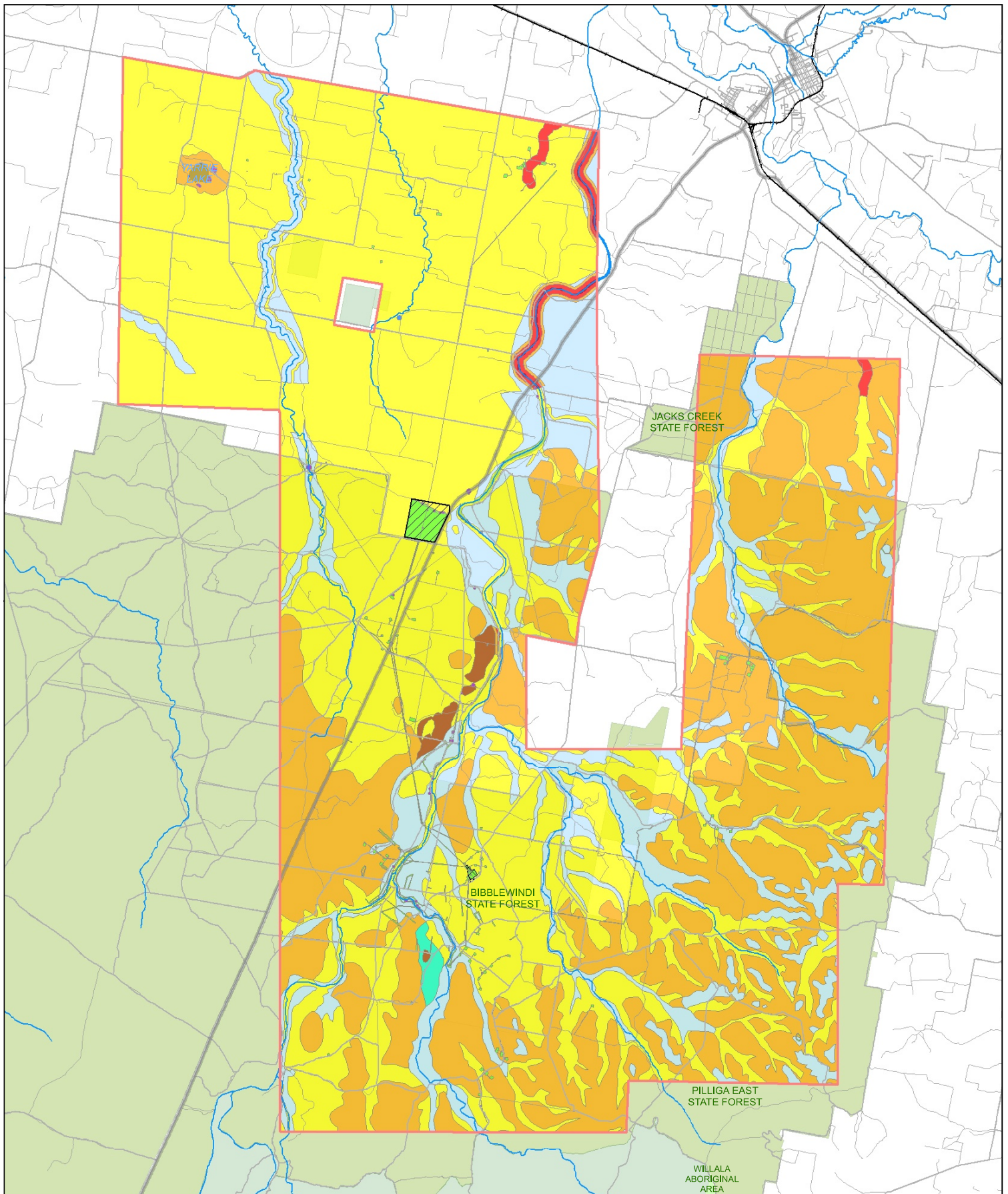
The Aboriginal cultural heritage zones within the footprint of the major facilities are:

- Leewood – zone 1b (known Aboriginal cultural heritage sites from other sources), zone 2 (previously surveyed / disturbed areas – no known Aboriginal cultural heritage sites), zone 3d (low sensitivity)
- Bibblewindi – zone 2 (previously surveyed / disturbed areas – no known Aboriginal cultural heritage sites) and zone 3d (low sensitivity)
- Bibblewindi to Leewood infrastructure corridor – zone 2 (previously surveyed / disturbed areas – no known Aboriginal cultural heritage sites)
- Leewood to Wilga Park underground power line – zone 2 (previously surveyed / disturbed areas – no known Aboriginal cultural heritage sites).

All Aboriginal cultural heritage zones are present within the gas field.

These zones would continue to be refined as more knowledge becomes available during the ongoing research program, additional site verification process, and pre-clearance surveys that would be specified in the Field Development Protocol (refer to Appendix C) and Cultural Heritage Management Plan (refer to Appendix N2).





<b>LEGEND</b> Project area Leewood Bibblewindi Parks and reserves State forest Aboriginal areas		<b>Cultural Heritage Zoning</b> Zone 1a - Known Aboriginal Cultural Heritage Sites (AHIMS) Zone 1b - Known Aboriginal Cultural Heritage Sites (Other Sources) Zone 2 - Previously Surveyed / Developed Areas (No ACH Sites) Zone 3a - Very High Sensitivity Zone 3b - High Sensitivity Zone 3c - Moderate Sensitivity Zone 3d - Low Sensitivity Zone 3e - Very Low Sensitivity Zone 3f - Indeterminant Sensitivity		Lakes and dams Watercourses Roads Train line
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## 20.3 Potential impacts – construction

The data gathered during the Aboriginal cultural heritage assessment process can be used to inform the siting of major facilities and the initial siting of field infrastructure to avoid all existing known cultural heritage sites and places of cultural value.

A Cultural Heritage Management Plan and Field Development Protocol would be implemented to guide the complete avoidance of highly significant sites or the reasonable and practical management of other sites (as discussed below). Therefore, the potential impact on Aboriginal cultural heritage is considered on the basis that the Cultural Heritage Management Plan and Field Development Protocol would be implemented.

### 20.3.1 Cultural heritage sites

The data audit identified a number of Aboriginal cultural heritage sites across the project area, and it is likely there are many more sites within the project area that have not yet been identified.

The project footprint would directly impact approximately one per cent of the project area (refer to Chapter 2). More than half of this footprint would consist of field infrastructure, such as drill pads, spread over the gas field (refer to Section 6.4). Impacts would most likely occur during the exploration and construction phases when physical works and ground disturbance activities occur in specified locations.

Without implementation of mitigation and management measures, the construction of major facilities and field infrastructure has the potential to impact on known and unknown cultural heritage sites. However, to minimise the potential for impacts on Aboriginal cultural heritage sites, the proponent has adopted two guiding principles for the project: the avoidance principle and the precautionary principle.

Implementing the avoidance principle would result in project activities being designed such that, to the greatest extent possible, there is no impact on Aboriginal cultural heritage. Where impact cannot be avoided, the project activity would be designed to minimise impact on Aboriginal objects, places or values, and other management measures as appropriate would be implemented to minimise or mitigate harm. The avoidance principle constitutes leading practice for cultural heritage management. As there is flexibility available in the placement of some elements of project infrastructure, it is also a feasible management option. In addition:

- construction would completely avoid many categories of highly significant sites; all 90 known sites within the project area, irrespective of site type, would be avoided
- specific objective conditions would be implemented for those categories where avoidance may not be possible.

Implementing the precautionary principle would result in actions that are reasonable and practicable to minimise harm to known Aboriginal objects, and / or identifying Aboriginal objects so they can be managed in accordance with the provisions of relevant legislation and regulations. Reasonable and practicable management measures would be determined on a case-by-case basis.

It is proposed to manage the site types in line with the significance assessment made for each category of site and by application of the avoidance principle.

Table 20-6 outlines the proposed management commitment for cultural heritage site types to be avoided. One additional site type is included—places where subsurface deposits may be encountered. In addition, infrastructure required for the project would not be located within specified buffer distances in areas where the 90 known Aboriginal cultural heritage sites are located. The 90 known sites and proposed buffer areas for each site are identified in Schedule 7 of the Cultural Heritage Management Plan



(Appendix N2). The known sites within the project area that have not yet been subject to the field verification program would be surveyed to confirm the location of these sites. As a further precautionary approach, a buffer would be provided around the sites.

Given the size of the project area, there may be other sites that have not been identified to date. To manage the risk of the project impacting on Aboriginal cultural heritage sites, the proponent is committed to a process of undertaking pre-clearance surveys prior to disturbing the land for infrastructure construction activities to verify whether the area contains Aboriginal cultural heritage sites. The process for the pre-clearance surveys is set out in the Cultural Heritage Management Plan (in Appendix N1). Should the pre-clearance survey identify an Aboriginal cultural heritage site of the type in Table 20-6, then The proponent would not locate the infrastructure in that area and would re-site the infrastructure after again following the same process.

**Table 20-6** Application of avoidance principle for site types in the project area subject to complete avoidance

Site type	Management commitment	Comment
Burials	Complete avoidance	All sites
Stone arrangements and earthen circles	Complete avoidance	All sites
Carved trees	Complete avoidance	All sites
Rock shelters	Complete avoidance	All sites
Grinding grooves	Complete avoidance	All sites
Quarries	Complete avoidance	All sites
Earthen mounds	Complete avoidance	Subject to confirmation as a cultural feature
Scarred trees	Complete avoidance	Subject to confirmation as a cultural feature
Hearths and ovens	Complete avoidance of this site type where identified during pre-construction activities	Subject to confirmation as a cultural feature. If identified during construction, mitigation in line with the 'new find measures' contained in the Cultural Heritage Management Plan
Places of traditional and anthropological significance identified in the cultural heritage assessment report or in a Cultural Heritage Management Plan	Complete avoidance	Sites previously identified by the proponent as places of traditional and anthropological significance or otherwise identified in the additional research program
Recent historic and contact sites	Complete avoidance	Sites previously identified by the proponent as recent historic and contact sites or otherwise identified in the additional research program

If the pre-clearance survey identifies an Aboriginal cultural heritage site of the type in Table 20-7, the proponent would, where practicable, not locate the infrastructure in that area and would re-site the infrastructure after again following the same process. If it is not practicable to re-site the infrastructure, then the proponent would adopt the management measures identified in the third column of the table.

Table 20-7 Application of avoidance and precautionary principles to remaining unknown site types in the project area

Site type	Management commitment	Comment
Stone artefact concentrations	<p>Maximise avoidance</p> <p>Avoidance efforts would be focussed on complex sites</p>	<p>Conditions to be set for management decisions. The avoidance principle will be adopted. Stone Artefact Concentrations, where two or more artefacts are within 1 m of each other, may be subject to relocation except where complex sites are encountered. Where complex sites are encountered they will be avoided.</p> <p>Complex sites are defined as places where a specific knapping event can be identified, grinding equipment (or fragments thereof) and / or ground edge tools (or fragments thereof) are present or form an element of the stone artefact concentration, there is sub-surface material that may be <i>in situ</i>, or the stone artefact concentration is directly associated with other site types.</p>
Shell middens	<p>Maximise avoidance</p> <p>Avoidance efforts would be focussed on complex sites</p>	<p>The avoidance principle would be adopted. Shell middens may be subject to mitigation except where complex sites are encountered. Where complex sites are encountered, they would be avoided.</p> <p>Complex sites are defined as places where the shell midden material has not been subject to a process that has caused disaggregation of the material, where there is a defined concentration of more than 10 shells or shell fragments over an area of more than 2 m<sup>2</sup>, there is a definable lens of shell, there is subsurface material that may be <i>in situ</i> or the shell midden is directly associated with other site types.</p>
Subsurface cultural material	Maximise avoidance	Potential archaeological deposits would be subject to testing in line with OEH specifications. Where it is confirmed to exist, all subsurface cultural material would be avoided. This would apply irrespective of whether the material is <i>in situ</i> or not.
Isolated stone artefacts	Maximise avoidance	Where isolated finds cannot be avoided, they may be relocated.

In addition to the avoidance principle for the above site types, it is also noted that Yarrie Lake is a place of Aboriginal cultural heritage significance. Accordingly, the proponent would not locate infrastructure for the project in Yarrie Lake or within 200 metres of its edge.

The commitments to pre-clearance surveys before placement of infrastructure, along with the commitments to avoidance (including but not limited to complete avoidance of the most sensitive site types) are the key components to minimising the potential impacts of the project on Aboriginal cultural heritage.

In addition to the pre-clearance surveys, the Cultural Heritage Management Plan includes measures for dealing with new finds if they are discovered during the course of project activities. This would initially involve stopping work and securing the area to prevent impact or harm.

The cultural heritage zoning scheme and sensitivity mapping would be continuously updated as the project progresses. This would enable project infrastructure to be overlaid on mapping and, if necessary, re-sited to avoid buffered areas. The site verification program (using a similar method to the pilot program described in Section 20.1) would be completed within 12 months of project approval. Until verification is complete the conservative buffers now in place would remain and be used for purposes of avoidance.

An additional research program would also be implemented to provide further information to guide the development of the project. The methodology for the additional research program would be developed in consultation with the Registered Aboriginal Parties.

Because of the application of the management measures, combined with project commitments, construction of the project would have minimal impact on Aboriginal heritage. These systems were trialled at Bibblewindi and Leewood (as discussed in Section 20.2.3) and found to be effective in yielding data to allow the avoidance and precautionary principles to be applied.

The Cultural Heritage Management Plan has been prepared and would guide the implementation of the Aboriginal cultural heritage mitigation and management measures for the project (refer to Appendix N2). All management commitments made in the Cultural Heritage Management Plan for the project would also be referenced in the Field Development Protocol (refer to Appendix C) which would set out the detailed environmental criteria and locational principles that are being used for site selection of field infrastructure within the project area. The Cultural Heritage Management Plan is discussed further in Chapter 30 (Environmental management and monitoring).

## 20.3.2 Cultural heritage values

### Categories of cultural heritage values

The cultural values identified in this assessment can be allocated to one of three broad categories. These categories are addressed below.

#### *Aboriginal cultural values category 1*

This category relates to those values that have a direct cultural heritage value and to which a specific geographical referent can be allocated.

Category 1 values include particular locations or places that are important due to traditional practices or historical events that have occurred or continue to occur there. It also includes places that people visit for recreational or educational purposes.

These places can be defined by geospatial data and therefore can be managed by applying the avoidance principle (as discussed in Section 20.3.1). Additional places that are considered to be category 1 would be investigated as part of the additional research program for the project.

#### *Aboriginal cultural values category 2*

This category relates to those values that are distinctly cultural and can be managed for their cultural value but where a specific geographical referent may not be available or is so broad as to be meaningless for management purposes as a 'place'. These cultural values may be better managed within the sphere of general ecological values management that also make provision for specific Aboriginal involvement in the management program.

Category 2 values include a range of primary values and contingent interests linked to ethnobotanical and ethno-faunal cultural values. For example, there are plants and animals that are of value to Aboriginal people because they provide important resources in the form of food, medicine or because they were traditionally significant (such as totemic emblems). However, they are not necessarily easily managed as individual items or locations in the way that can be done for a particular cultural place.

Where concentrations of ethnobotanical or ethno-faunal resources are known to occur, these can be protected as an element of category 1, as discussed above. Alternatively, these values can be managed through offsets, where the long-term viability of these values can be guaranteed in perpetuity (offsets are discussed in more detail below).

### *Aboriginal cultural values category 3*

This category relates to those values that are general in nature and lie firmly within the sphere of general social and community engagement while also having a distinctly Aboriginal aspect.

Category 3 values include those more general and possibly esoteric values that are neither easily addressed as part of an Aboriginal cultural heritage management program, nor are able to be captured through application of an environmental management regime using offsets. For instance, while it may be possible to protect a particular location that is of aesthetic or recreational value (where these places have a geographical referent) as places of contemporary cultural value, it is not possible to so manage an attitude that the entire area has a general, ill-defined aesthetic value.

It is the proponent's view that the management of these values would be best done, for example, by programs associated with social and community engagement, where issues of employment and housing can be addressed. All cultural values identified would be managed in line with this model. Relevant sectors within the proponent's organisation would be suitably briefed to capture and respond to category 3 values with appropriate management strategies.

### *Potential impacts on cultural heritage values*

In addition to potential impacts on Aboriginal cultural heritage sites, the project could have an impact on a range of Aboriginal cultural heritage values associated with the project area. These impacts were identified through the assessment process and consultation program with the Registered Aboriginal Parties. The potential impacts raised by the parties include:

- general loss of access to land
- loss of access to traditional resources including both plants and animals
- a diminution of the ability to pass on traditional knowledge about cultural heritage sites and resources
- further loss of important cultural heritage sites valued by the Aboriginal community
- general impacts in relation to particular locations that the Aboriginal community may visit for recreational, educational or aesthetic reasons
- further loss of opportunity to maintain community and family association with the Pilliga forests area
- impact on cultural values associated with water due to contamination of aquifers.

Many of these potential impacts already exist and stem from historic or current land use practices or from legislative provisions that inhibit Aboriginal access to and use of land, rather than from the project itself. Therefore, potential impacts on cultural heritage values should not be seen as new types of impact that have not previously occurred in this region.

These potential impacts are discussed in more detail below.

### *Loss of access to land and traditional resources including plants and animals*

Approximately 1,000 hectares of the 95,000-hectare project area would be subject to disturbance from the project. In terms of available resources in the region, the Pilliga Forest has a total area of around 500,000 hectares. The project would impact on approximately one per cent of the project area and about 0.2 per cent of the total forest area. All of the remaining forest areas could still be accessed subject to conditions that are imposed by regulatory agencies or landholders. Some of the project facilities and

infrastructure would be situated on private land. In cases where access is not currently available there would be no additional loss of access.

The project would also be staged and field infrastructure would come into use and be retired at different stages of the project's life. Once the life of the well or other field infrastructure has expired, the area would be rehabilitated to its original use. Therefore, the area of disturbance at one time would be less than the total disturbance over the life of the project. Plant communities once associated with that area would be re-established by rehabilitation and subject to suitable corridors existing, wildlife would also return.

The proposed offsets program would also address access to land.

Overall, therefore, there would be a limited loss of access to land and to traditional resources including plants and animals as a result of the project.

### *A diminution of the ability to pass on traditional knowledge about cultural heritage sites and resources*

The general loss of access, and access to traditional resources, could result in a diminution of the ability to pass on traditional knowledge. The project would be staged and the area of disturbance at one time would be less than the total disturbance over the life of the project. Once the field infrastructure is retired, access would be reinstated to the levels previously available.

The proposed offsets program also addresses this issue (offsets are discussed in more detail below).

### *Further loss of important cultural heritage sites*

Implementation of the avoidance principle (refer to Section 20.3.1) and the Cultural Heritage Management Plan (refer to Section 20.6) would result in complete avoidance of the most important Aboriginal heritage sites or locations that may have strong social values, and maximum avoidance of all other sites.

### *Impacts on locations that the Aboriginal community may visit for recreational, educational or aesthetic reasons*

Potential impacts may be due to access, which has been discussed above, and would be a short to medium term possibility. However, there would be no direct impacts as these would be considered 'recent historic and contact sites' and would be subject to complete avoidance in accordance with Table 20-6.

### *Loss of opportunity to maintain community and family association with the Pilliga Forest area*

Aboriginal communities would still have high levels of access to the Pilliga forest, similar to that which they currently enjoy. Short-term restrictions to access would be reinstated (refer to issue 'Loss of access to land', above).

The proponent is committed to promoting the Aboriginal communities' connection to the Pilliga forest area and has separately set in place additional measures to address this issue through its social benefits programs.

The proponent would also aim to maximise Aboriginal employment on the project. The Aboriginal Engagement Policy encourages the development of partnerships with groups, government and community organisations for the delivery of Aboriginal employment and training. This is discussed further in Chapter 26.

## *Impact on cultural values associated with water due to contamination of aquifers*

Water quality in aquifers has particular cultural values due to its association with a creator being, such as the Rainbow Serpent. The potential impacts on groundwater are addressed in Chapter 11 (Groundwater and geology), which also includes project commitments and management measures to minimise the potential for impacts. Groundwater would also be monitored for the project duration (refer to Chapter 30 – Environmental management and monitoring).

## Offsets

Offsets seek to offset (rather than compensate) a particular impact. They offer opportunities to implement leading practice management in other locations and provide tangible positive outcomes for future generations.

Consideration of Aboriginal cultural heritage values is a key component of the biodiversity offset strategy (refer to Appendix J1). Cultural heritage values would be identified and integrated into biodiversity offsets in four ways:

- Aboriginal cultural heritage values such as important sites, places of traditional or recent significance and culturally important plants and animals would be identified as part of the selection of suitable land-based biodiversity offsets
- community access to biodiversity offset areas would be facilitated where practicable
- community management of offset lands would be encouraged
- Aboriginal-owned land would be prioritised in this program.

If the cultural values offsets program were to include places or values other than those associated with culturally valued plants and animals, there would be a need to develop a broader offsets program that enhances conservation outcomes in consultation (and, as appropriate, through negotiation) with the relevant Aboriginal community.

Funds provided for the management of the offsets program may contribute to:

- resourcing ongoing site management within the region
- for interpretive and educational materials
- acquisition of land where important cultural sites exist that have not attracted management support from regulatory agencies.

## 20.4 Potential impacts – operation

### 20.4.1 Cultural heritage sites

During operation, there is the potential to impact on known and unknown Aboriginal cultural heritage sites through access and maintenance activities. For example, if vehicles or workers deviate from already cleared areas, or areas that have previously been subject to pre-clearance surveys for the construction period.

Relevant management measures provided in Section 20.6 would continue to be implemented during operation of the project. This includes the implementation of the Cultural Heritage Management Plan

which would continue to provide for the protection and management of Aboriginal heritage within the project area and measures for managing the discovery of new finds.

## 20.4.2 Cultural heritage values

The potential impacts on cultural heritage values during operation would be generally similar to those presented in Section 20.3.2. However, with much of the field infrastructure and some of the major facilities, once the initial construction is complete the additional areas required for right-of-way or well pad construction would be reduced to the area necessary for operation.

The proponent is committed to promoting the Aboriginal communities' connection to the Pilliga forest area and has separately, through its social benefits programs, set in place additional measures to address this issue further. As mentioned in Section 20.3.2, the proponent's Aboriginal Engagement Policy means that it would aim to maximise Aboriginal employment on the project, during both construction and operation. This is discussed further in Chapter 26.

## 20.5 Potential impacts – decommissioning

Decommissioning activities are not expected to impact on a larger area than the area that would have been surveyed and assessed for the construction phase of the project. Therefore, potential impacts on cultural heritage sites and values during decommissioning are not expected to be additional to those discussed in sections 20.3 and 20.4. Management measures in Section 20.6 would continue to be implemented throughout the decommissioning phase of the project.

## 20.6 Risk assessment

A range of mitigation and management measures is proposed to control the risk of potential impacts of the project on Aboriginal heritage. Table 20-8 demonstrates the effectiveness of these mitigation measures in reducing the level of environmental risk posed by the project.

In addition to the listed measures, the following additional mitigation and management measures not listed in Table 20-8 would also be implemented for the project:

- the Cultural Heritage Management Plan would be updated as required by conditions of approval and implemented for the project
- the proponent would work with relevant entities such as the native title claim group, relevant LALCs and others, to improve relevant data in the project area and where appropriate, to be used in the management of Aboriginal cultural heritage when the Cultural Heritage Management Plan is periodically reviewed.



Table 20-8 Environmental risk assessment

Potential impact	Phase	Pre-mitigated risk			Mitigation and management measures	Residual risk		
		Likelihood	Consequence	Risk		Likelihood	Consequence	Risk
Disturbance or encroachment on known Aboriginal cultural heritage	Construction	Likely	Major	High	Complete pre-clearance surveys with the involvement of the Aboriginal community in accordance with the Cultural Heritage Management Plan prior to land disturbance occurring in that area.	Unlikely	Major	Medium
	Operation	Possible	Major	High		Remote	Major	Medium
	Decommissioning	Unlikely	Major	Medium		Remote	Major	Medium
Disturbance or encroachment on the following unknown Aboriginal cultural heritage site types: Burial, stone arrangements and earthen circles, carved trees, rock shelters, grinding grooves, quarries, earthen mounds, scarred trees, hearths and ovens, places of traditional and anthropological significance, recent historic and contact sites	Construction	Almost certain	Major	Very high	All currently known sites and the most sensitive site types (as detailed in the Cultural Heritage Management Plan) will be completely avoided by the project.	Unlikely	Major	Medium
	Operation	Likely	Major	High	The Cultural Heritage Management Plan will be reviewed every five years.	Remote	Major	Medium
	Decommissioning	Possible	Major	High	Project employees and contractors will be made aware of their statutory obligations to protect Aboriginal cultural heritage objects under the <i>National Parks and Wildlife Act 1974</i> .	Remote	Major	Medium
Disturbance or encroachment on the following unknown Aboriginal cultural heritage site types:	Construction	Almost certain	Moderate	High	All currently known Aboriginal cultural sites within the project area will be validated within 12 months of project sanction.	Unlikely	Moderate	Medium
	Operation	Likely	Moderate	Medium	A research program targeting places and values of particular traditional, anthropological, historical and contemporary significance to Aboriginal people will be developed and completed within 12 months of project sanction.	Remote	Moderate	Low
	Decommissioning	Possible	Moderate	Medium		Remote	Moderate	Low



Potential impact	Phase	Pre-mitigated risk			Mitigation and management measures	Residual risk		
		Likelihood	Consequence	Risk		Likelihood	Consequence	Risk
Stone artefact concentrations, shell middens, subsurface cultural material, isolated stone artefacts					Integration of Aboriginal cultural heritage into the project's offset strategy.			
Impacts on cultural heritage values	Construction	Possible	Moderate	Medium		Unlikely	Minor	Low
	Operation	Unlikely	Moderate	Medium		Remote	Minor	Very low
	Decommissioning	Remote	Minor	Very low		Remote	Minor	Very low

## 20.7 Conclusion

Aboriginal cultural heritage sites were identified during the data audit. However, the number of sites identified does not constitute a realistic estimate of the actual sites that probably exist in the project area; therefore, additional Aboriginal heritage sites are likely to be encountered.

Risks associated with the project include impacts on Aboriginal heritage items or sites as a result of clearing and site preparation, construction and operation / maintenance activities. Decommissioning is unlikely to result in new areas of disturbance.

As there is a high degree of flexibility for the location of field infrastructure, a Cultural Heritage Management Plan can be implemented to guide the management of cultural heritage sites within the project area and thereby manage the risk of disturbance. A Cultural Heritage Management Plan for the project has been developed in consultation with the Registered Aboriginal Parties and is provided in Appendix N2. This would be implemented as part of the project.

The assessment in this EIS concludes that:

- by application of the avoidance principle there would be no impact on high significance cultural heritage sites
- there would be a potential impact on four categories of sites (though anticipated, unlikely and remote with use of mitigation and management measures)—isolated stone artefacts, non-complex stone artefact scatters, non-complex shell middens and hearths or ovens identified during construction
- a management approach based on the avoidance principle as outlined in the cultural heritage assessment is feasible with the Cultural Heritage Management Plan in place (refer to Appendix N1). The avoidance principle would also be included in the Field Development Protocol for the project (refer to Appendix C), which would set out the detailed environmental criteria and locational principles that are being used for site selection of field infrastructure within the project area
- the impact of the project on Aboriginal cultural values would be minimal to negligible. However, as the consequence of impacting Aboriginal heritage sites would be minor to moderate (depending on the site type), the results would be 'low to medium' residual risk to Aboriginal cultural heritage
- an offsets program would provide new conservation opportunities. It would provide for direct Aboriginal involvement in management of offset areas and, in certain circumstances, it could provide for ownership of those areas. Components of the program of engagement with the Aboriginal community of this area offer capacity to provide for inter-generational equity. The offsets program would further reduce the residual risk of impacts on cultural heritage values to 'low to very low'.

Residual risks associated with potential impacts assessed in this chapter are summarised in Table 20-9.

Table 20-9 Aboriginal heritage residual risks

Potential impact	Construction	Operation	Decommissioning
Disturbance or encroachment on known Aboriginal cultural heritage	Medium	Medium	Medium
Disturbance or encroachment on the following unknown Aboriginal cultural heritage site types: Burial, stone arrangements and earthen circles, carved trees, rock shelters, grinding grooves, quarries, earthen mounds, scarred trees, hearths and ovens, places of traditional and anthropological significance, recent historic and contact sites.	Medium	Medium	Medium
Disturbance or encroachment on the following unknown Aboriginal cultural heritage site types: Stone artefact concentrations, shell middens, subsurface cultural material, isolated stone artefacts.	Medium	Low	Low
Impacts on cultural heritage values	Low	Very low	Very low

