

Australia Pacific LNG Project

Volume 5: Attachments

Attachment 39: Non-Indigenous Heritage Technical Report – Gas Fields

Australia Pacific LNG Gas Field

Non-Indigenous heritage

A report to Australia Pacific LNG

by

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November 2009

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1. Introduction

Australia Pacific LNG Pty Limited proposes to develop a project enabling the creation of a world scale, long-term industry, utilising Australia Pacific LNG's substantial coal seam gas resources in Queensland. APLNG holds significant interests in less developed areas across the Walloons Fairway in the Surat Basin, which together with the Talinga coal seam gas field constitutes the Walloons gas field development area.

The Walloons coal seam gas field covers an area of 570,000 ha, and will include up to 10,000 wells over a 30 year project lifespan. Gas and water gathering systems will be developed for delivery to gas plant facilities and water treatment facilities respectively. Associated infrastructure will include roads, transfer ponds, communication infrastructure and logistics support areas.

1.1 Study Area

The coal seam gas field near the Central Queensland town of Miles is a landscape characterised by undulating downs of the Brigalow Belt. This area was formerly covered with forested areas with dense brigalow (*Acacia harpophylla*) scrub, and surrounding areas covered in luxuriant grassland. The brigalow forests are now substantially cleared for agriculture and cattle grazing. Leichhardt commented on the region thus:

The soil is black and yet mild with many concretions of lime; the vegetation is quite different from that of the forest ground of the other side of the coast range; the grasses are more various, but they do not cover almost exclusively the ground. They grow more socially in small communities together, separated by succulent herbs particularly compositae. [Leichhardt 1844 in Bell 2004:47]

The area is drained by numerous permanent and semi-permanent creeks, many of which flow into the Condomine River, located in the southern portion of the gas field.

1.2 Purpose

This investigation describes the non-Indigenous heritage and post-contact land-use history of the gas field region. It documents the registered heritage places and potentially significant site locations in and around the project area, and proposes measures to mitigate any impacts that might result from the project.

The specific aims of this non-Indigenous heritage assessment are to:

- meet the requirements for non-Indigenous heritage in the project Terms of Reference
- identify historical themes relevant to the non-Indigenous use of the gas field study area
- identify known non-Indigenous heritage sites within the gas field study area
- assess the likelihood of further items of heritage significance occurring in the gas field study area
- assess the significance of sites located in the gas field study area, in terms of their meeting criteria defined for inclusion in Local, State or National heritage registers
- provide advice on appropriate measures for the mitigation of impacts to identified heritage sites, appropriate to their level of significance

- propose a methodology for the management of non-Indigenous heritage sites identified during construction on the gas field.

A small number of sites have been located during preliminary fieldwork conducted in the gas field study area. These have been incorporated into the assessment. These provide an indication of non-Indigenous heritage sites that occur in the region to be affected by gas field development.

1.3 Legislative framework

In Queensland, both Commonwealth and State legislation protects non-Indigenous heritage sites. This heritage legislation works in concert with planning instruments, which require consideration of heritage sites in the planning approval process.

1.3.1 Commonwealth legislation

Two pieces of Commonwealth legislation serve to protect Australia's inland heritage. These are the *Environment Protection and Biodiversity Conservation Act, 1999* and the *Australian Heritage Council Act, 2003*. The Commonwealth authority responsible for the administration of this legislation is the Department of Environment, Water, Heritage and the Arts (DEWHA).

Environment Protection and Biodiversity Conservation Act, 1999

This legislation provides protection for items and places with World, National or Commonwealth heritage values. It is the primary piece of Federal environmental legislation in Australia, providing the legal framework for the protection and management of nationally and internationally recognised flora, fauna, ecological communities and, of greatest relevance to this discussion, cultural heritage places defined under the Act as being of national significance.

Both nominated or accepted cultural heritage sites can be protected under this Act, either through inclusion on the National Heritage List or, if they are on Commonwealth land, on the Commonwealth Heritage List. This Act also provides protection for cultural heritage items and places on the World Heritage list. The criteria used for inclusion on the National (and Commonwealth) Heritage List include:

- importance in the course of Australia 's natural or cultural history
- possession of uncommon or endangered aspects of Australia 's natural or cultural history
- potential to contribute to an understanding of Australia 's natural or cultural history
- importance in demonstrating the key characteristics of a class of natural or cultural places
- importance in exhibiting aesthetic characteristics valued by a community or cultural group
- importance in demonstrating creative or technical achievement at a particular period
- special association with a particular community for social, cultural or spiritual reasons
- special association with the life or works of persons of importance in Australia 's history, and
- importance as part of Indigenous tradition.

Any development that could impact on a listed heritage place of national or international importance, requires Ministerial approval before it can proceed.

In 2003, the Australian Heritage Council was created, under the *Australian Heritage Council Act*, to administer the National Heritage List and Commonwealth Heritage List.

The Australian Heritage Council Act, 2003

The *Australian Heritage Council Act, 2003* established the Australian Heritage Council as the principal advisory body to the Australian Government on heritage matters, particularly in relation to administering the lists created under the *Environment Protection and Biodiversity Conservation Act, 1999*. It replaced the Australian Heritage Commission, the authority previously responsible for assisting in the administration of Federal heritage legislation and for creating the Register of the National Estate on which were placed items of recognised heritage value.

The role of the Australian Heritage Council is to:

- assess cultural heritage items and places for inclusion in the National Heritage List or Commonwealth Heritage List
- advise the Minister in relation to the inclusion of places in, and the removal of places from, the List of Overseas Places of Historic Significance to Australia
- advise the minister on matters relating to the condition of places included in the National Heritage List or Commonwealth Heritage List
- advise the minister on the Commonwealth's responsibilities for historic shipwrecks
- promote the identification, assessment, conservation and monitoring of heritage, and
- keep the Register of the National Estate.

The Australian Heritage Commission had from 1975 maintained a list of significant heritage locations on the *Register of the National Estate*. More than 13,000 items were listed, including non-Indigenous heritage sites. With the introduction of the *Australian Heritage Council Act, 2003*, the Register of the National Estate was closed to new entries from 19 February 2007. From then, until February 2012, it will remain a statutory instrument, with the Minister required to consider it when making decisions under the *Environment Protection and Biodiversity Conservation Act, 1999*. In the transition period, entries on the Register of the National Estate are being transferred to local, State and National heritage registers, where appropriate. From February 2012, the Register of the National Estate will remain as a publicly available archive, but all reference to it will be removed from the *Environment Protection and Biodiversity Conservation Act*.

The National Heritage Places Inventory is maintained by DEWHA, and contains summary information about places listed in State, Territory and Commonwealth Heritage Registers and Lists. It is as an online, searchable database.

1.3.2 State legislation

The Queensland authority responsible for non-Indigenous heritage protection is the Queensland Heritage Council, assisted by the resources of the Department of Environment and Resource Management (DERM). The Heritage Council keeps a register of significant heritage places and sites, the *Queensland Heritage Register*, and administers the *Queensland Heritage Act, 1992* (QHA).

Queensland Heritage Act, 1992

For non-Indigenous heritage, the *Queensland Heritage Act, 1992* provides specific pathways to protection. Its stated aim is 'to provide for the conservation of Queensland's cultural heritage for the benefit of the community and future generations.' (Section 2.1). To meet these objectives, the Act (Section 2) enabled:

- the establishment of the Queensland Heritage Council

- creation of the Queensland Heritage Register
- creation of local heritage registers
- regulation, in conjunction with other legislation, of development affecting the cultural heritage significance of registered places
- provision for heritage agreements to encourage appropriate management of registered places, and
- provision for appropriate enforcement powers to help protect Queensland's cultural heritage.

The Queensland Heritage Register, established under Section 31 of the Act, is a record of State heritage places and protected areas (Section 6), and, since amendments in 2008, also includes archaeological sites. Register entries include details of the boundaries of the area or place, its history, a description of its fabric and whether it is the subject of a heritage agreement. For State heritage places, a statement of significance is required, addressing cultural heritage criteria defined by the Act. For archaeological places, a statement of significance, relating to established archaeological criteria, is required. For protected areas, a statement of significance, relevant to its declaration as a protected area, is required. The Register is a public document.

The Act addresses the obligations and rights of developers. The main requirement is that, under Section 68 of the Act, development of a place listed on the Queensland Heritage Register can only proceed with the approval of the Chief Executive. Any damage to a site or place listed or provisionally listed on the Queensland Heritage Register, attracts a penalty.

Not all places and objects of heritage value are known prior to development. This is particularly the case with archaeological sites, sometimes unearthed during construction. The obligation here, under Section 89 of the Act, is for a person to advise the chief executive about any archaeological artefacts that are an important source of information about an aspect of Queensland's history. The discovery must be notified in a timely manner with advice on where it was discovered, photographs and a description. Once artefacts have been reported, it is an offence under Section 90 of the Act to interfere with these artefacts, within 20 business days of informing the Chief Executive of their discovery. 'Interfere' includes: 'damage, destroy, disturb, expose or move' (Section 88).

Places of heritage significance are not always listed on the register, but are nevertheless known to members of the public. A place can be nominated for inclusion on the Queensland Heritage Register at any time and pending development may prompt such nomination. The Minister may issue a stop order to protect from damage any place (entered on the Register or not) considered to be of cultural heritage significance. A stop order will operate for up to 40 business days until the place has been assessed and further decisions made about its fate (Section 154).

1.3.3 Local legislation

Amendments to the *Queensland Heritage Act* 1992, introduced in 2008, required local government agencies to establish their own registers of heritage places, unless they already had satisfactory measures in place to protect sites under existing planning instruments (Sections 112,113).

A further 2008 amendment also provided for the integration of State and local government assessment and approval processes under the Integrated Development Assessment System (IDAS) of the *Integrated Planning Act* 1997 (Section 121). Sites listed on local government heritage schedules within the project area are subject to assessment provisions specified under this Act.

1.4 Cultural heritage significance

Cultural heritage can be defined as the integration of the links between history and humanity. Places with cultural heritage significance provide a sense of the connections between the community and landscape, between the past and the present and are the tangible traces of the Australian identity and experience.

The evaluation of site significance undertaken in this study derives from a framework identified in the Burra Charter which urges consideration of the aesthetic, historic, scientific, social and spiritual values of places from the past, in the present and for the future (Marquis-Kyle and Walker 1994). Within this framework, the significance assessment of locations identified along the pipeline route has been carried out using criteria laid down in Section 35 of the *Queensland Heritage Act, 1992* to identify heritage items of State significance. These criteria are:

- a) the place is important in demonstrating the evolution or pattern of Queensland's history
- b) the place demonstrates rare, uncommon or endangered aspects of Queensland's cultural heritage
- c) the place has potential to yield information that will contribute to an understanding of Queensland's history
- d) the place is important in demonstrating the principal characteristics of a particular class of cultural places
- e) the place is important because of its aesthetic significance
- f) the place is important in demonstrating a high degree of creative or technical achievement at a particular period;
- g) the place has a strong or special association with a particular community or cultural group for social, cultural or spiritual reasons; and/or
- h) the place has a special association with the life or work of a particular person, group or organisation of importance in Queensland's history.

These criteria are founded on five *cultural heritage values*: aesthetic, architectural, historical, scientific, social and technological.

To be entered into the QHR as an archaeological place, a site or place must have the potential to contain an archaeological artefact that is an important source of information about Queensland's history (Section 60).

Any site or place, which meets the criteria, may be included on the Queensland Heritage Register. The legislation clearly states that places are not to be excluded on the grounds that similar sites have previously been listed (Section 35.2).

In addition to locations deemed to be of National, State or Local significance, and recognised through their listing on relevant heritage lists and registers, are other sites that do not meet register listing criteria, but which still provide a setting in which to understand the region's historical land-use. These locations have been described in recent studies as being sites of historical interest (HI) (Archaeo Cultural Heritage Services 2009). This assessed low heritage value does not warrant the level of protection necessary for sites of Local, State and National heritage significance.

1.4.1 Scientific assessment criteria

Most of the sites found in the proposed Australia Pacific LNG gas field are archaeological sites. These do not necessarily rate highly in terms of the values used to evaluate significance: aesthetic, architectural, historical, social or technological. They do, however, rate more highly when evaluated for their scientific values.

There are a number of criteria used to assess site significance from a scientific perspective. These criteria include the site's integrity, its structure and contents: qualities allowing the assessment of its value for research purposes. In addition to the above criteria, a site may also be of scientific significance simply because it is rare.

Site integrity

Site integrity refers to the degree to which a site has been disturbed, or alternatively, to how well it has been preserved. Disturbance may have occurred in the past through repeated use of a site, or may be recent, resulting from erosion or recent land-use. The spatial distribution of artefacts and features at a site can provide important clues about the nature of a site's use, and therefore, sites which are least disturbed, are generally of greater value for research purposes.

Site structure

Structure refers to the physical dimensions of a site, including stratigraphy, size and the patterning of archaeological material and presence or absence of built structures. A site with undisturbed sub-surface deposits has greater research potential than a site that has been modified by subsequent land-use. Often a site's structure can only be determined through remote sensing techniques or from sub-surface examination.

Site contents

This category refers to the range of occupation material and structures found in a site. Some sites contain a diverse range of cultural items, allowing various aspects of site's history to be elucidated. An evaluation of site contents provides some indication of the potential of a site to address current and future research questions.

It is necessary to consider the scientific values, in addition to the community values of non-Indigenous heritage sites, more commonly assessed in terms of their aesthetic, architectural, historical, social or technological aspects, to decide on the most appropriate level of protection during development.

2. Methodology

2.1 Method

The non-Indigenous heritage assessment for the gas field portion of the project was carried out using:

- on-line resources, principally for information on legislation, heritage site data bases, histories, general information
- a search of the Commonwealth register for listed sites of international and national significance (World Heritage List, National Heritage List, and Register of the National Estate)
- a search of the Queensland Heritage Register. A GIS layer was created for recorded sites in and around the Project area and compared with planned project infrastructure
- a search of the register of the Queensland National Trust
- requests for information to local Councils and historical societies
- publicly available books and histories
- discussions with individuals and organisations with an interest in the region's heritage, and
- localised field survey in the gas field, in areas where landowner access has been granted.

A contextual history of the area has been provided and previous studies reviewed. Site information from the various site databases and data sources, were then collated and mapped. To provide a context in which to assess the heritage values of the sites in the project area, heritage locations in the surrounding area have also been considered. While this may have resulted in the inclusion of sites well distant from the location of the planned development, it has ensured that significant heritage places that might be indirectly impacted by the project are also identified and helps to contextualise sites in the study area.

2.2 Field investigations

To test the validity of the site distribution models, a short program of field inspection was undertaken through the gas field to identify locations with non-Indigenous heritage values. This was constructive, in identifying locations along road and rail corridors and around the fringes of settlement, which contained locally significant non-Indigenous heritage sites. The field investigations also revealed invaluable information on heritage sites from members of the local community. While field inspections revealed a few previously unrecorded sites, community members were able to identify numerous sites and locations of local heritage significance. These have been included in this analysis.

Field inspections were carried out in the southern portion of the gas field, known for its connection with Leichhardt's 1847 expedition and more recently for forestry operations. Field studies took place at the following locations: Brigalow Creek, Teatree Gully, Weir River and Cattle Creek. Other areas were examined in the Condamine district, near Cooloomala Creek, Sandy Creek, Wieambilla Creek and the Condamine River. No non-Indigenous sites were discovered in any of these locations. An area near Cattle Creek, north of Wallumbilla was also examined and an abandoned soldier settlement homestead was located. A number of properties were visited in the Chinchilla district with the owners. The location where Leichhardt crossed Charlies Creek, south of Chinchilla, the *Cactoblastis* breeding station at the *Bug Farm* and the site of the first Chinchilla bush swimming pool on Charleys Creek were recorded.

2.3 Consultation

Information on non-Indigenous heritage sites in the gas field region came from a wide range of sources, however, the most valuable of these were long-term residents of the district; people with a passion for the recording of local history and the protection of sites associated with that history. Many of the sites they identified were recorded in no other source, or were only known from vague written references. Additionally, representatives of organisations charged with protecting heritage sites, including Regional Council officers and the National Trust of Queensland, provided valuable insights into the listed sites in the gas field study area. The people contacted as part of this investigation are listed in Table 1.

Table 1 List of heritage contacts for the gas field region of the Australia Pacific LNG Project

Contact	Organisation or location	Region
Beryl and Harold Rennick	Chinchilla Field Naturalist's Club	Chinchilla district
Beryl Dwyer	Chinchilla	Chinchilla, Kogan and district
Merlene Coates Freeman	Miles and District Historical Village and Museum Committee	Miles and district
Dinah Frazer	Wandoan Heritage Society	Wandoan District
Gail Taylor	Chinchilla and District Historical Society and Museum Committee	Chinchilla and district
John Gray	The Shanti (Bug Farm), Clarks Road, Chinchilla	Cactoblastis research and breeding station
Kel Gaske	Greenswamp, Chinchilla	Sites associated with the old Chinchilla swimming pool
David Fuller	Chinchilla	Leichhardt sites south of Chinchilla
Hilda Heffernan	Miles and District Historical Village and Museum Committee	Miles and district
Dr Val Dennis Heritage Information Officer	National Trust of Queensland	Entire gas field area
Information officer	Maranoa Regional Council	Eastern portion of gas field
Information officer	Western Downs Regional Council	Western portion of the gas field

2.4 Limitations

There are limitations in the data collected for this project. The data is limited because heritage lists, the first source of information on non-Indigenous heritage sites, contain a bias in the types of sites recorded. The bias is essentially toward built heritage and away from archaeological sites. Most registered non-Indigenous cultural heritage sites and places in Queensland have been recorded as a result of the interests of members of local historical societies, the National Trust and in more recent times by academics, heritage architects and cultural heritage practitioners. There is an overwhelming bias in favour of public buildings, homesteads and monuments, with few listed archaeological sites

other than mine sites. Admittedly, only since early-2008 has heritage legislation in Queensland recognised the value of non-Indigenous archaeological sites as well as buildings.

Field surveys and to a greater extent, the community consultation program have addressed some of these limitations. Both survey and consultation are incomplete and continuing fieldwork and consultation may still reveal further sites and their history.

3. Existing Environment

Included in this section is a brief history of the gas field, investigating relevant themes to provide the context in which to evaluate non-Indigenous heritage places and sites. Registered heritage sites, sites identified in earlier studies, and locations with heritage significance recorded during localised field surveys and consultation with local heritage groups and individuals carried out during this investigation, are noted.

3.1 Historical Context

3.1.1 Exploration and mapping

Exploration of the gas field region commenced in the mid-19th Century, with Ludwig Leichhardt's expedition to Port Essington (near the site of present day Darwin). On 1st October 1844, he set out from *Jimbour* (*Jimba*) station 27km northeast of Dalby, which at the time was on the northwest pastoral frontier (Black 1978:1). The expedition passed through the eastern side of the gas field area, in the vicinity of Chinchilla, Miles and Guluguba. They travelled northwest, along the Condamine River, then to Dogwood Creek (in the area that later became Miles), then through the areas that later became Guluguba, and Taroom and on to Port Essington, arriving in December 1845.

Researchers have mapped the locations of two of Leichhardt's camps, one at Rocky Creek (Kent's Lagoon) northwest of Chinchilla, visited on 9 October 1844 (Black 1978:1) and the other at Dogwood Creek on 23 October 1844 (Robb 1996:x)

In December 1846, Leichhardt set out on a second expedition, again from *Jimbour*. The expedition initially followed the Condamine River. On the first day they reached a station 'which had lately been taken up by Mr Goggs' and camped on Dogwood Creek. On 11 December the party camped at Charleys Creek (later Chinchilla), and remained there until 5 January 1847. On 7 January they 'camped on the banks of Dogwood Creek, about two miles higher up than Dr Leichhardt's old camping place' (Bunce 1857:114).

In 1847, Frederick Isaac, who had travelled with Leichhardt, claimed *Dulacca* on the lower Condamine (Archaeo Cultural Heritage Services 2009).

A number of camps have been identified by historians from the Chinchilla district (Bell 2004) and trees marked with Ludwig Leichhardt's distinctive 'LL', have been found, one at a camp near Chinchilla and another at Guluguba. A section of trunk which contained the initials on the first tree is in the Queensland Museum and the second was lost in a bushfire (Partlett 1982:24).

Exploration by pastoralist-explorers slowed in the late 1840s and early 1850s, due to conflict with Aboriginal people. Many abandoned their properties in the face of this resistance (Collins 2002). By 1859, however, with Aboriginal resistance crushed by the Native Police and punitive expeditions mounted by the squatters, the land was again made available to the European settlers.

Later, surveyors mapped out the transport routes and towns. For example, the town of Condamine developed at a safe crossing point in the river for bullock teams and was inhabited by 1854. It was formally surveyed in 1859. Chinchilla was surveyed as a town when the rail reached it, as too was Miles. In 1879, Government surveyor (and former explorer) A.C Gregory, surveyed eighty miles either side of the railway line from Dalby to Roma (ERM 2009:17).

Apart from maps and journals, material remnants of exploration are typically marked trees and campsite remains, located on the explorers' routes. Typical remains of surveying are survey trees, either initialled or blazed, and the neatly laid out towns.

3.1.2 Contact with Indigenous people

Explorers and pastoralist-explorers, and presumably runaway convicts, were the first to be aware of the presence of large numbers of Indigenous people in the area. After his first expedition Leichhardt wrote that along the Condamine:

The well-known tracks of Blackfellows was everywhere visible: such as trees recently stripped of their bark, the swellings of the apple tree cut off to make vessels for carrying water, honey cut out and fresh steps cut in trees to climb for opossums. [Leichhardt 1847:9]

The explorers were rapidly followed by squatters seeking out the best land, sending overseers to stock their newly claimed runs. Following a brief period of relatively peaceful coexistence, relations between the Aboriginal people and the squatters became violent. French (1989) relates numerous instances of opposition to the occupation. Squatters along the Condamine apparently faced fierce resistance. Ferguson (1960:20) wrote of John Ferrett, a squatter who had claimed *Dogwood* in 1850:

[Aboriginal people] had driven most of the squatters from the lower Condamine with great loss of life, Ferrett only holding his run through his great tenacity.

Isaac who had accompanied Leichhardt and returned to claim *Dulacca*, settled in 1849 with his flock of sheep. Indigenous people soon scattered 3,000 of them. With the help of the Native Mounted Police, based at the Wondai Gumbal camp on Tchanning Creek, he retrieved some of the sheep, but disheartened, he allowed his lease to lapse (Ford *et al.* 1978:10).

The situation escalated dramatically with the 1857 massacre of a family at *Hornet Bank* station and the large-scale reprisals that followed. Massacres of Aboriginal people and the rampages by Aboriginal people that followed these events were noted in the area as far afield as Banana, Wandoan and Roma. Two of the principal protagonists: the owner of *Hornet Bank* and a surviving son of the massacred family, for many years engaged in wholesale and indiscriminate retaliation, and ended up living on *Durham Downs* (Strong 2005:12).

Juandah was claimed in 1853. It was later almost completely resumed, part being surveyed for the town of Wandoan and part divided into small selections. Following on from events at *Hornet Bank*, *Juandah* was the site of a raid by Taroom Aboriginal people, on the rampage after the reprisal massacres. Fox (1959:105) re-told a story of the raid:

After the Hornet Bank murders, the Taroom aboriginals raided Juandah, where in the ensuing struggle one hundred and fifty of them were killed. They were buried on a sand ridge west of the homestead, and many old residents in the district declared that for many years afterwards ghosts could be seen there ...

Another incident also occurred at *Janduah*. An Aboriginal man, 'Wild Toby' was arrested at his camp on the station, and in the process both he and a policeman were killed. The policeman's grave is outside the homestead gate and Wild Toby's is where he fell, at his nearby camp, now called Toby's Corner.

In most areas, Aboriginal people were employed as station hands, stockmen, cooks, maids or nursemaids from the earliest times and lived in camps on the stations. By the 1860s many also lived in fringe camps outside the towns. The Taroom Aboriginal Settlement was set up in 1910 in response to residents' objections to fringe camps and within a few years the government decreed that all

Aboriginal people and female 'half-castes', including station employees, were to be taken to such settlements (Fox 1959:131).

There was also a fringe camp at Warra, on the eastern edge of the gas field.

I arrived in Warra in February 1907 ... Warra at that time had a population that included about a hundred blacks. [They worked in the hotel laundry, as horsebreakers and wild cattle hunters] ...after the floods of 1908, the black's camp washed away, Bella drowned, and all the blacks removed to Berambah and Taroom [reminiscences of Paul Eckhoff, who went there as a prickly pear selector Ferguson 1960:61]

The last of the Barunggam were taken from near Chinchilla to live on the Taroom Aboriginal Settlement in 1912.

Material indications of this early and protracted contact with Indigenous people may take the form of massacre sites (bullets, human remains, fortified homesteads); artefacts made from post-contact materials such as glass, ceramic or iron; station camps (fireplace hearths, horseshoes, stone artefacts); and town fringe camps. It also includes graves, such as Wild Toby's at *Janduah*.

3.1.3 Pastoralism

Pastoralism on the Darling Downs, to the east of the study area, had been established since 1840. The soils were rich and the country ideal for sheep. It was not until after Leichhardt had begun exploring in 1844 that pastoral stations were established beyond *Jimbour*. Most new runs were established by squatters encouraged by the reports of Leichhardt's expeditions but some, especially those in the district south of Chinchilla, were founded by pastoralist-explorers, seeking out land on the edge of the Downs. *Chinchilla* was established by Matthew Goggs in 1848; John Dugan had a depasteuring licence for *Wallen* in 1848; Isaacs settled at *Dulacca* in 1848; Richard Birrell on *Tieryboo* in 1849, and John Ferret on *Dogwood* in 1851 (Ford *et al.* 1978:9). *Yandilla* and *Cecil Plains* were established by Henry Stuart Russell, selecting the best land along the Condamine River (French 1989:73).

Early sheep stations at *Chinchilla* and *Kogan* employed Chinese and Scottish shepherds. The sheep were penned into folds at night to protect them from dingoes (Hando 1994:22). Evidence of Chinese shepherds huts have been found near Chinchilla (Black 1978:90).

In the early years of settlement, turnover of runs in the district was high. One reason was the resistance from Indigenous people who persistently dispersed the sheep, but also the soils and vegetation in the area near Miles were far from ideal, being either sand with cypress and bull-oak that was difficult to clear, or else deep clay and brigalow that could only be cleared with intensive burning and ringbarking (Ford *et al.* 1978:13). Despite runs in the area being smaller and more manageable, they were much less viable than the more fertile country to the southeast and the large pastoral stations to the northwest.

By the 1870s, burr infestation became a problem and cattle replaced sheep. Shepherds were replaced with fences, which were expensive to build but cheaper to maintain than shepherds.

Material remains of pastoralism are likely to include remains of homesteads, huts, camps, sheepfolds, woolsheds, fences, stockyards, machinery and graves.

3.1.4 Closer settlement

'Closer settlement' involved a fundamental change from large pastoral stations, to a mixture of smaller stations and small grazing and agricultural selections. A series of land reform Acts were introduced

from the 1860s. The first, in 1863, aimed to wrest control of the land from the squatters, particularly those who possessed but did not use their land, for genuine settlers.

This initially led to a concerted effort by squatters to stock all their runs, and also led to a renewed rush for land. The Act required runs to be stocked and many speculators turned up with their flocks in case the squatters had not stocked their runs (McManus 1915:35).

In 1868 a further Crown Lands Act consolidated leases and allowed for some of the combined leases to be resumed.

In 1884 the Dutton Land Act was passed, bringing in the first real round of 'closer settlement'. It allowed for the resumption of half of each consolidated lease. The scheme was widely criticised by squatters and, with combined with drought, tested both the squatting families and those who took up the smaller grazing selections.

Drought encouraged the brigalow to take over the black soils and after the drought, prickly pear arrived, as did cattle tick, both of which took their toll.

The 1884 Act affected runs also on the eastern side of the gas field. While the aim of the Land Acts was to open the land to more settlers, the results were unsuccessful in this area. The properties were too small to be economically viable, and later were re-amalgamated.

The Cooperative Communities Land Settlement Scheme operated near Chinchilla and Kogan in the 1890s. Under this scheme, twelve communities of skilled workers were set up as self-governing bodies to live as small communes and work the land. Three communities were established in the Chinchilla-Tara district. These were Mizpah and Monmouth located a few kilometres north of Chinchilla. The third, known as Mulga was situated 3km south of the railway from Brigalow, on the edge of the study area. Temporary camps were set up and huts were built, but people quickly became disillusioned and left.

At the Mulga community, located near a large, permanent waterhole, 30 families were involved. Brigalow was felled and twenty hectares enclosed by a fence. Wooden humpies were built and a school erected. After six months most families had returned to Brisbane, and after eighteen months only two families remained. The old posts of the stockyards at Mulga still survived in 1978 (Black *et al.* 1978:15).

In 1906 further Acts were introduced to enforce closer settlement. In 1910 *Juandah*, originally claimed in 1853, became a 'surrendered holding', part taken up as a town (Wandoan) and part closely settled. By 1910 the homestead and 4,000 acres was all that remained of the original *Juandah*, and by 1913 selectors had moved in.

The 1906 Closer Land Settlement Act worked well in the Chinchilla district, with an overall increase in population and prosperity. Cropping and dairying were introduced with this successful phase of closer settlement and Chinchilla's first butter factory was built in 1910 (Hando 1994:15).

Prickly pear hastened the extension of closer settlement in the Kogan/Tara area as many of the larger runs surrendered their leases in the face of prickly pear infestation. To encourage land clearing, the government arranged 'prickly pear selections' with no repayments for twenty years (Ferguson 1960:54). A group settlement scheme took up most of the land between *Perth* (between Kogan and Tara) and Brigalow Creek, and immigration, previously supplying Chinese and Scottish shepherds in the 1850s, increased.

In the 1920s and 30s land was once again resumed and offered for selection. This coincided with the growth of Wandoan and Tara as rail towns and as a result these towns began to prosper. Chinchilla also grew.

Closer settlement in the Tara district was impractical due to the dense brigalow. It survived on the timber industry with sawmills exploiting the ironbark and native pine (Ferguson 1960:54-59). In the main towns in the brigalow belt (Tara, Miles, Wandoan and Taroom) closer settlement only really became successful after 1950, when new techniques and new machinery made it possible to clear and plough the dense brigalow scrub:

Closer settlement has long been retarded by the problems of successfully clearing the dense brigalow growth and ploughing the strongly gilgaid surface. [Dick 1960:5]

Cultural remains of the closer settlement period include ringbarking camps, fencing, evidence of the new agricultural industries, and remains of the group settlement schemes. Previously recorded sites associated with closer settlement are the Chinchilla butter factory and remains of the Mulga Group settlement scheme.

3.1.5 Cobb and Co

Condamine was surveyed as a service centre to surrounding runs but also because it was well placed as a communication hub. It was known as an excellent crossing point in 1854 and became a stopping point for Cobb and Co. coaches. The mail coach route went through Dalby, Kogan and on to Condamine, crossing the study area from east to west. When the railway was built to the north, completely bypassing Condamine, and rail became the main mail carrier, the town of Condamine declined.

Remains of Cobb and Co staging posts are found along the original coach route. The bridge at Condamine, sites within the town and various coach items in museums through the district are a reminder of the important role of stage coaches in the past. Evidence of other forms of communication include the remains of telegraph lines (telegraph posts and porcelain or glass insulators).

3.1.6 Rail

The main towns in the study area are railway towns, stretched out along the Western Railway Line. In 1875 the Western Railway Act was passed, providing for a reservation of 80km each side of a straight line from Dalby to Roma. During construction, sidings were used for collecting timber from the surrounding area for bridges and sleepers for the rail, so the railway provided much local employment. Columboola, located 14km east of Miles, was initially a rail siding. It became a place with a station, fettlers huts and a station masters cottage. Baking Board, 8km west of Chinchilla and also on the rail line, thrived on timber used in the railways.

The railway had already reached Dalby in 1868; Charleys Creek (later Chinchilla) and the crossing at Dogwood Creek (later Miles) in 1878, Drillham in 1878, Dulacca and Jackson in 1879 and Roma in 1880. Charley's Creek and Roma were already settlements but Miles, Drillham, Dulacca and Jackson were established with the railway. Charleys Creek had been on the main dray route from Toowoomba to Western Queensland, and teams carting wool regularly camped there. By the time Chinchilla was surveyed around the railway in late 1880, it already contained three hotels, three stores and two butchers shops. The rail bypassed by several miles an existing settlement at Old Ulebah, so the new town (named Yuleba) was moved to beside the railway line.

Miles township developed around the railway camp. A work crew camp was set up, and stores and pubs followed. It became a thriving settlement and was soon surveyed. Originally called Dogwood

Crossing, its name was changed to Miles, after Sir William Miles the owner of *Dulacca* station and a member of the Queensland Parliament (Ford *et al.* 1978).

Guluguba, Wandoan and Tara are all railway towns, built around branch line fettlers' settlements. By the 1920s, fettlers' tents had been replaced by wooden cottages at Guluguba and these are still in evidence today (Partlett 1986:13). Wandoan was originally part of *Juandah* station and in 1890 had a coach changing station. The township was surveyed in 1902 and at the time was still known as Juandah. It was not until the arrival of the railway in December 1914 that the town began to thrive (Dick 1960:7, Reschner 2003:153-4). The name of the town was changed in 1926 to avoid confusion with the similarly named Jundah, located 700km to the northwest.

Archaeological sites associated with the railway are found along the main railway corridors through the study area and include the remains of railway stations, sawmills, fettlers huts, and abandoned railway settlements, as well as abandoned rail alignments.



Plate 1 Historic photo of the 'Bug Farm', where *Cactoblastis* moths were bred as a biological control for prickly pear. (Photograph Chinchilla Library Photograph Collection 3)

3.1.7 Prickly pear

Prickly pear or common pest pear (*Opuntia stricta*) was introduced into Australia from the Americas in the early 1800s, as a drought stock fodder, or according to some by Matthew Goggs of *Chinchilla* Station as a garden ornamental. Without natural enemies and in a favourable climate, it spread rapidly, and for many years made the land unusable. By 1879 it had begun to spread widely and by 1895 it was declared a noxious weed in Queensland. By 1920, 60 million acres (243,000 km²) was unusable and this was spreading by 1 million acres (4,000km²) annually.

The 1920s and early 1930s was a period of declining population [in many of the brigalow belt towns]. The problem of dense prickly pear cactus infestation of brigalow land had assumed grave proportions. [Dick 1960:11]

People around Wandoan and Chinchilla abandoned their selections and many families moved from the area (Fox 1959:124). Families that had come to take advantage of closer settlement, soon left. The infestation was almost total and though new settlers were offered land, on the condition they clear the pear.



Plate 2 Remaining shed used for *Cactoblastis* breeding at Chinchilla’s “Bug Farm”.

An experimental station was set up in Dulacca to test the effectiveness of various poisons in controlling the pear. Renowned Australian botanist Dr. Jean White, was in 1912 appointed officer-in-charge of the Dulacca experimental station by the Queensland Board of Advice on Prickly Pear Destruction. She was charged with investigating techniques to control the Dulacca pear (*Opuntia inermis*). Over a four-year period she conducted more than ten thousand experiments using weedicides and biological controls, and demonstrated the efficacy of the cochineal insect (*Coccus indicus*) in controlling one species of prickly pear (*Opuntia monacantha*). In 1916 the Dulacca experimental station was closed down and her final report noted that although arsenic pentoxide was effective in controlling the prickly pear, the only cost-effective measure was the discovery of a biological control (Australian Dictionary of Biography). In 1924, Alan Dodd was in control of an experimental research station (‘The Bug Farm’) on a property known as *The Shanti*, west of Chinchilla. Dodd as head of the biological control section of the Queensland Lands Department travelled to Argentina and brought back 3,000 *Cactoblastis* eggs. They were bred successfully and trialed in facilities in Brisbane and Chinchilla. Once they were shown to be effective, and not likely to attack other plants, they were transported around the state to help with the control of the pear. In 1932 the Prickly Pear Land Commission reported that the problem had been solved. The control of the pear resulted in an almost magical transformation of the landscape and to the lives of the settlers. Those who had stayed reaped the benefits of their newly productive selections. The Dulacca experimental

station and the Chinchilla *Cactoblastis* breeding station, were crucial in this process and are items of state heritage significance. The *Cactoblastis* Memorial Hall at Boonargo, 10km east of Chinchilla was dedicated to the insect responsible for reclaiming the land in the surrounding region.

3.1.8 Depression and World War II

The Great Depression and World War II had wide-ranging effects, especially on the eastern side of the study area. Prickly Pear was under control but a shortage of labour made agriculture difficult to revive.

During the war, a contingent of American soldiers was based at Columboola, a rail settlement that was originally part of the *Columba* run. The soldiers required a camp, an ammunition depot, and special rail carriages to transport munitions. A watch tower was built nearby (Robb 1996:133,135). Chinchilla residents built a cheese factory in response to a government plea to provide for the Services, although this was unsuccessful. Foreign nationals (Italians and Albanese) were interned in four camps north and northwest of Chinchilla (ERM 2009:28), from which they undertook work in the forests and on road construction.

After World War II the introduction of mechanical clearing changed the face of farming through the district. Ringbarking was replaced with machinery, leading to the removal of large areas of forest for grazing and agriculture (Hando 1994). Wandoan became a centre of soldier settlement. Over one hundred blocks were made available in the scheme, resumed from the surrounding properties (Fox 1959:111). Chinchilla benefited from the introduction of new machinery with the grain (wheat, barley, sorghum) and cotton production (Hando 1994:17).

Archaeological traces of the Depression and War years include remains of the army camps, ammunition depots and ex-army machinery, traces of the watch tower at Columboola, buildings made from recycled materials dating from this era, the internment camps, the sleeper mill at Tara, and the cheese factory at Chinchilla.

3.2 Known non-Indigenous heritage sites

Sites previously recorded in the gas field include several listed on heritage registers and sites described in other information sources. Locally significant sites are included in local heritage registers, where these exist, or as heritage overlays or schedules of historic cultural places, in local planning schemes.

3.2.1 Registered sites of Commonwealth, National and State Significance

Sites in this category include those registered on Commonwealth, National and State heritage lists. These are contained in the Australian Heritage Places Inventory, and associated contributing lists: the World Heritage List, National Heritage List, the Register of the National Estate, and the State Heritage Register.

Within the gas field study area there are no cultural heritage sites registered on the World Heritage List, Commonwealth Heritage List, or the National Heritage List. There is one site listed on the Register of the National Estate, Jimbour Station Homestead, east of the study area.

Two sites of state heritage significance are found in the study area and listed on the Queensland Heritage Register. These are the Digger Statue in Chinchilla and the Nostalgic Queens Theatre in Wallumbilla. Neither site would be affected by development in the gas field.

Chinchilla Digger Statue, Heeney Street Chinchilla (Queensland Heritage Register)

This is one of 55 surviving ‘digger statues’, of the 61 erected throughout Queensland shortly after WWI.

Nostalgic Queens Theatre, George Street Wallumbilla (Queensland Heritage Register, nominated site in Maranoa Regional Council Bendemere Shire Planning Scheme)

Built in 1939, this theatre is an example of early picture theatres, first showing silent films, common to rural towns. It still retains its original purpose.

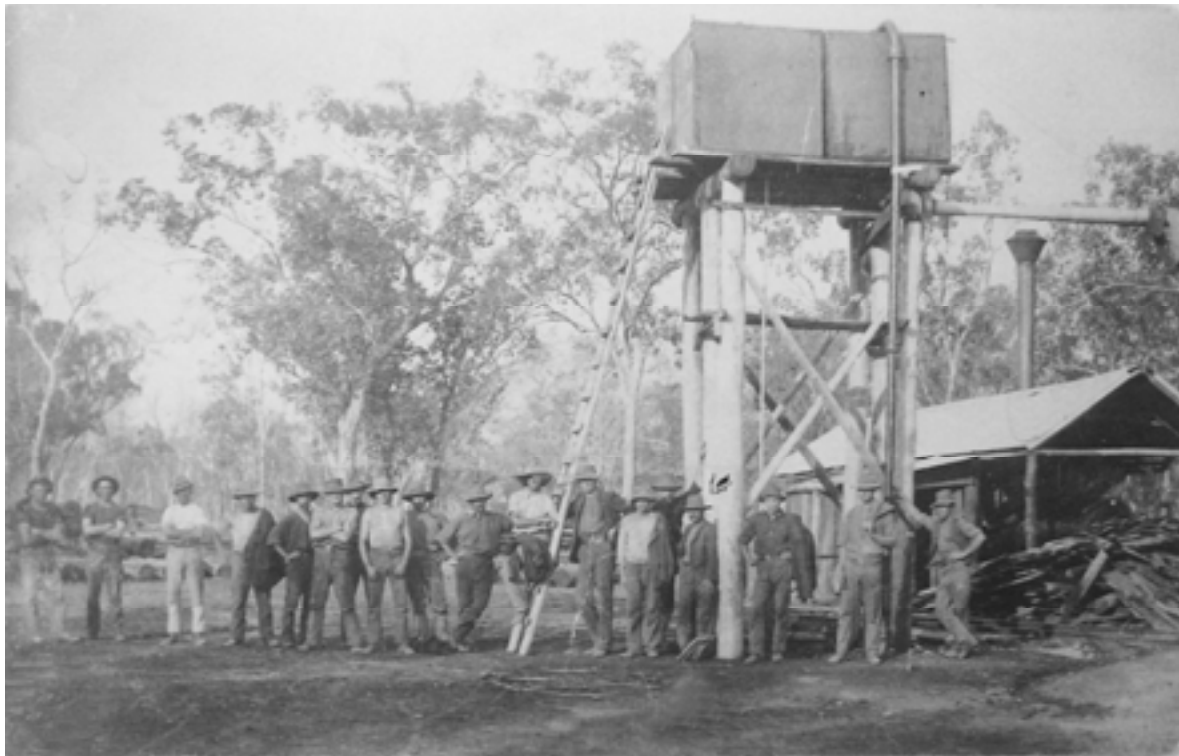


Plate 3 Sleeper mill at dam on Rocky Creek 1912. (Chinchilla Library Photographic Collection Number 8)

3.2.2 Sites of local heritage significance

Sites listed in local heritage registers and planning schedules, those listed by the National Trust of Queensland and others recorded in local histories and heritage studies are listed below in Table 2. In some cases while the sites have been identified, their exact locations are unknown.

Table 2 Sites of local heritage significance identified during field studies and through research.

Site Name	Location	Description
Wandoan district		
Old Juandah Cemetery	The cemetery is only metres outside the old homestead	It includes the grave of Constable O’Dwyer, who was killed along with Indigenous man, Wild Toby,

Site Name	Location	Description
	gate.	when he attempted to arrest him (Fox 1959:83).
Wild Toby's burial place	Toby's Corner near Wandoan	Indigenous man, Wild Toby lived at a campsite on the Juandah property and after the fatal altercation with Constable O'Dwyer was buried at his camp. (Fox 1959, Partlett 1986)
Petrol tin shed	Wandoan	Before the introduction of petrol pumps after World War I, petrol was transported in four gallon tins, two tins to a case. This shed was built with flattened petrol tins. Empty cases were used to make furniture and the tins were used for a variety of purposes. Hardy (1969) includes a photo of a shed made from flattened petrol tins at Wandoan in the 1920s. It was still standing in 1969 (Hardy 1969:62).
Suspected massacre burial site at Juandah	West of Juandah historical site	Juandah Station was selected in 1853 by Salway and Stephen. After the murders at Hornet Bank, there was a raid by Iman Aboriginal warriors at Juandah. It was reported that 150 men were killed and these were buried on a sand ridge to the west of the homestead (Fox 1959:105). Soon afterwards the property changed hands to Charles and Edwin Royd who remained there for forty years
Site of Leichhardt tree and possible campsite remains	Downfall Creek, 7km east of Guluguba	Comprised "...two neatly cut 'L's' ... on the eastern side of the trunk about six inches in length and the edges of the letters were worn smooth with years of weathering. (Partlett 1986:24, Fox 1959:13).
Leichhardt's monument	Guluguba	This monument commemorates explorer Ludwig Leichhardt's 1844 expedition, which passed through the district.
Guluguba School	Leichhardt Highway, Guluguba	School was established in 1917 and after a period of use was abandoned, to reopen in 1964. None of the early buildings remain (Personal communication Mary Parker, Principal/ Teacher, Guluguba School)
Wandoan Cemetery	Western side of Leichhardt Highway, 5km north of the town. Lot 133 on FT617 (Banana Regional Council, Taroom Shire Planning Scheme)	Wandoan Cemetery containing the graves of local residents.
Railway station, Wandoan	Leichhardt Highway, Wandoan	The railway was opened on 16 December 1914, after railway construction was delayed for some time at Giligulgul. The railway station was recently moved to a location on the Leichhardt Highway.

Site Name	Location	Description
Chinchilla district		
Baking Board	North and south of railway line,	Baking Board was a rail camp built during the construction of the Dalby – Roma railway. The railway was built through the area in 1878 and the station in 1908. It was a community built and sustained by the railway and timber getting. In its heyday it had several hotels, stores, butcher's shop, and bark and timber shanties (Matthews 2004:219). The workers cottages were removed in 1974. Archaeological traces survive in the area.
Baking Board Cemetery	Baking Board, Lot 83 on LY566	Cemetery containing the remains of residents dating from the late 19th Century.
Chinchilla cemeteries	Chinchilla, Lot 188 on C24373 Reserve 155 (Chinchilla Pioneer Cemetery) Cemetery Road, Chinchilla, Lot 18 on SP105894	Two cemeteries with early graves (Pioneer Cemetery) and more recent graves including those who occupied the Group Settlement Schemes.
Chinchilla butter factory site	On the eastern side of Charleys Creek	The Chinchilla Dairy Company was formed in 1908 and within three years plant was installed and operations commenced. Production commenced slowly but rapidly expanded and by March 1913 butter output was 49,540lb (22,470kg) per month. Despite problems with bankers the factory remained operating through the years of World War I and by 1929 had outgrown its flood-prone premises. A new factory was built, opening in March 1931. Production increased, particularly after the solution to the prickly pear was discovered. Increases settlement also increased the availability of cream for butter manufacture. Dairy farmers throughout the district and the factory itself prospered (Matthews 2004:378-409).
Chinchilla cheese factory	On the eastern side of Charleys Creek	In response to a call by the Commonwealth Government for cheese to supply the armed forces in World War II, the board of the Chinchilla Dairy Company decided to build a new cheese factory. In April 1942 the new factory commenced production of cheese. The operation continued for only six months before losses began to mount. The factory was closed in October 1943 (Matthews 2004:392-3).
Chinchilla prickly pear experimental field station	'The Bug Farm', The Shanti, Clarks Road, Chinchilla	This was the site where Cactoblastis moths were successful bred, to be distributed around the district

Site Name	Location	Description
		to control the prickly pear menace. One of the four sheds that housed the moths remains on “The Shanti”, known locally as “The Bug Farm”.
Mizpah, Monmouth and Mulga, Group Settlement Schemes	Mizpah located slightly south of Charleys Creek and to the east of Chinchilla; Monmouth to north of Chinchilla; Mulga south of Brigalow	Remains of the Mizpah, Monmouth and Mulga, Group Settlement Schemes that operated during the period of closer settlement. (Matthews 2004:142).
Old Chinchilla swimming pool	Located on Greenswamp in a waterhole off Charleys Creek.	There are exotic plantings around the pool including camphor laurel and a pepper tree. The pool had a diving tower, the base of which still remains at the site, although the structure had been removed by 1980. The pool was famously visited by Olympic champion Dawn Fraser.
Miles district		
RAAF Area Explosives Reserve	Kowguran, 20km north of Miles beside Leichhardt Highway	The Kowguran Explosives Depot was a WWII ammunition dump with 20 underground storage bunkers, each 60m long and covered by up to 4m of earth and concrete.
Fettlers Camp	6.5km west of Miles, beside Leichhardt Highway	This was the campsite for railway fettlers building the railway between Miles and Dulacca in 1878-1879. The site is extensive and contains ceramic and glass. A plaque records the site and lists a number of graves at the site.
Graves	Memorial in road reserve on southern side of Warrego Highway. Unmarked graves are located c.100m north east.	The site contains the graves of four children who drowned tragically in the railway weir on Drillham Creek on 15 January 1893. They were the children of railway lengthman Charles and Matilda Roehrig (Roadside plaque and personal communication Merlene Freeman, Miles and District Historical Village and Museum Committee)
Goombi State School site	Southern side of Warrego Highway, 23km east of Miles	Site of Goombi State School, Number 1293, in use from 1915-1965.
Coolumboola WWII Ammunition Dump Site	2.5km north of Coolumboola	A WWII ammunition dump, guarded by Lt. Folkert, Lt. Williams and 5 Enlisted Men of the 577th Ordnance Ammunition Company from 2 February 1944. A campsite was located nearby. A tall, timber watchtower was located at the site but fell over in 1992 and was removed. Another campsite was located south of Columboola. Up to 1,000 troops were stationed at the Columboola camps (Personal communication Hilda Heffernan and Merlene

Site Name	Location	Description
		Freeman, Miles and District Historical Village and Museum Committee)
Christianberg Fence	3km north of Miles on eastern side of Leichhardt Highway	Posts with bush timber rails wired to posts c 1920s. Christy (Christian) Andersen, Danish blacksmith, arrived in the district in the early 1900s. He milled the local cypress pine in a sawmill on the property. He owned another sawmill in town (Miles) and a hotel in town called the Union (later burnt down). He became a blacksmith in town and made Condamine bells. (Personal communication Merlene Freeman, Miles and District Historical Village and Museum Committee).
Former Dalwogan Siding Site	9km north of Miles	Previously located on west side of railway station, north of road crossing. Cream and other goods were loaded on and off the train here. The siding building is now in the Miles Historical Village. There was no stationmaster but a person living nearby was paid as a gatekeeper (Personal Communication Merlene Freeman, Miles and District Historical Village and Museum Committee).
Cobb and Co route	Ryalls Road, north from Warrego Highway, 14km east of Miles	Part of Cobb and Co, route. North along Ryalls Road, (Personal communication Merlene Freeman, Miles and District Historical Village and Museum Committee)
Welsh's huts	Beside Leichhardt Highway south of Gurulmundi	This was the Welsh's family house c1920s, now abandoned. The smaller building may have been built earlier. The Welsh's came to live here before the war with their children. The Welsh boys (the children) lived on there for many years (Personal Communication Merlene Freeman, Miles and District Historical Village and Museum Committee).
Welsh's Blitz truck	Beside Welshs Road, 3km east of Gurulmundi	Blitz truck acquired by the Welsh family and used to 'snig' (pull) timber. It was abandoned about 30 years ago (Personal Communication Merlene Freeman, Miles and District Historical Village and Museum Committee).
Welsh's dump	2km east of Leichhardt Highway, on Welsh's Road	Dump containing old bottles and other debris left by the Walsh Brothers (Personal Communication Merlene Freeman, Miles and District Historical Village and Museum Committee).
Dingo Barrier Fence	Various places including 25km north of Miles beside Leichhardt Highway	Built 1948-1950 to keep dingoes out of sheep country, it is the world's longest fence, stretching from near Jimbour to the Great Australian Bight. An

Site Name	Location	Description
		earlier fence was built in the 1880s to keep out rabbits. Dingo netting attached to the top of rabbit fences, preceded the Dingo Barrier Fence.
Murilla Bore	6km west of Miles beside Warrego Highway	Bore associated with the Murilla Oil Company and drilled using a percussion technique in 1937. Top of bore lining, uncapped exposing water with oily film on surface. Timber and concrete structures at site.
Giligulgul School	Approximately 250m north of Giigulgul Road.	School site with standing structure, although school is no longer used.
Kowguran Siding	19km north of Miles on Miles – Wandoan railway	Railway siding originally with fettlers' cottages, since been removed (Personal Communication Merlene Freeman, Miles and District Historical Village and Museum Committee).
Remains of Giles Brickworks	2km east of Drillham	'Giles Miles' bricks used in a number of buildings in Miles including the Windsor Hotel and the Bank of NSW c 1937. Site includes a dam, remains of a cement structure and bricks on the ground. It is still called 'brick hill'. Giles owned the brickworks, the Murilla Oil Bore (closer to Miles), the Conloi Oil bore (west of Gurulmundi), the Picture Theatre in Miles and a sawmill. All the Giles brothers were builders. Merlene used to pick up 'Giles Miles' bricks from the site as a child. It closed with labour shortages associated with WWII (Personal communication Merlene Freeman, Miles and District Historical Village and Museum Committee).
Wallumbilla district		
Wallumbilla Railway complex	Southern side of the Warrego Highway in Wallumbilla	Includes the grain storage silo and railway buildings, some of which date from the late 19th Century. This site has been reported as being of potential heritage significance in Maranoa Regional Council Bendemere Shire Planning Scheme.
Wallumbilla Hospital	Corner of Stake Yard Road and West Street Wallumbilla	Site has been reported in the Maranoa Regional Council Bendemere Shire Planning Scheme, although its status has not been assessed.
Dulacca district		
Dulacca experimental station	Buildings removed	Dulacca was the site of an experimental station where efforts were first made to eradicate the prickly pear (<i>Opuntia stricta</i> spp. and <i>O. aurantiaca</i>). The location is associated with renowned Australian botanist Dr. Jean White, who in 1912 was appointed

Site Name	Location	Description
		officer-in-charge. Over a four-year period she conducted more than ten thousand experiments using weedicides and biological controls, and demonstrated the efficacy of the cochineal insect (<i>Coccus indicus</i>) in controlling one species of prickly pear (<i>Opuntia monacantha</i>). In 1916 Dr White resigned and the Dulacca experimental station was closed down, with the buildings removed.
Mud brick homestead	Dulacca West	A house constructed of mud and reed with a tin roof over an original shingle roof, built in 1893. Reported to the National Trust of Queensland, but not yet investigated. Recent field studies have revealed that this building no longer exists.
Dulacca Hotel	Northern side of the Warrego Highway at the eastern end of town.	The town's hotel, known as the Waterhole on the Hill, dates back to 1908.
Kogan district		
Perth cattle yards	South of Tara Kogan Road and west of Wambo Creek	Reported to the National Trust of Queensland, but not yet investigated.
Condamine Cemeteries	Wambo Street Condamine, Lot 8 on C4423 Leichhardt Street Condamine, Lot 88 on ROG3422	Contain the graves of early residents of the Condamine district.
Bridge crossing Condamine River	Condamine	Bridge over the Condamine River to the west of the township.
Yuleba district		
Yuleba Railway Complex	Located in the centre of Yuleba to the south of the Warrego Highway	Site reported in Maranoa Regional Council Bendemere Shire Planning Scheme although not assessed.
Yuleba Creek Bridge	Located 1.5km to the east of Yuleba on Warrego Highway	Historic bridge on Warrego Highway. A reported site in the Maranoa Regional Council Bendemere Shire Planning Scheme. This site has been assessed and has been identified as being of heritage significance by the National Trust of Queensland.
Rocky Creek Bridge	Located on Warrego Highway 5.3km east of Yuleba	Historic bridge on Warrego Highway. A reported site in the Maranoa Regional Council Bendemere Shire Planning Scheme.
Jackson Railway Station	Located on the Western Line in Garden Street Jackson	Historic railway buildings dating from the late 19th Century when the railway was built.

Site Name	Location	Description
Combidiban Creek Bridge	10km east of Yuleba, on Warrego Highway	Historic road bridge reported, but not assessed, in Maranoa Regional Council Bendemere Shire Planning Scheme.
Condamine district		
Original Condamine Cemetery	Located on the southern side of Wambo Street in Condamine	Cemetery used from 1859 – 1864.
Tieryboo Homestead site and nearby corduroy crossing	6km north of Condamine, a short distance from the Condamine River.	Tieryboo was one of the early pastoral stations in the district, dating from c.1848. The homestead is now in ruins. The Cobb and Co. route passed nearby and a section of corduroy road still survives here (Personal communication Merlene Freeman, Miles and District Historical Village and Museum Committee).
Nagram corduroy crossing	7.7km east of Condamine beside Sherwood Road.	This is a portion of the Cobb and Co. route between Kogan and Condamine (Personal communication Merlene Freeman, Miles and District Historical Village and Museum Committee).
Horton Downs Provisional School No. 1148 site	15.4km north east of Condamine, beside Condamine River.	Early school site, with no standing structures. The school operated in this location from 6.4.1908 to 12.10.1925 after having been moved from an earlier location (Condamine Road). There may be surviving archaeological traces at the site.

3.2.3 Review of Existing Heritage Reports

In addition to those identified from published sources and local heritage registers are others recorded during heritage surveys conducted as part of environmental impact assessment. A number of these reports on non-Indigenous heritage have been reviewed. These provide valuable information on the history of land use in the region and provide site lists that indicate the range and distribution of heritage sites that might be expected in the gas field.

Strong, M. 2005 Historical assessment of the Durham Downs Gas Field Project

This non-Indigenous heritage assessment took place in Origin Petroleum Leases in the Durham Downs area, in the northwestern portion of the gas field study area. investigated the historical sites and associated history on *Durham Downs*, *Meeleebee*, *Lighthouse* and *Pony Hills* stations. The examined properties overlap with the present study area. Thirty seven non-Indigenous cultural heritage sites were recorded, including homesteads, sheep folds, surveyors camps, shepherd's huts, a squatter's camp, family graves, huts and yards and a Chinese vegetable garden. Four of these sites have been identified as being of greater significance than others, classified by Strong as being of *Regional* Heritage Significance. This category signifies sites that landowners though particularly significant (Strong 2005:104). These four 'regionally significant sites are the *Durham Downs*

Homestead, two sheep folds (on *Wybara* and *Spring Gully*), and a sandstone and bush timber cattle ramp (at *Lighthouse*).

Nineteen of the 37 identified cultural heritage sites are within the gas field, however the entire sample of sites provides clues to the types of sites that may be found elsewhere in the study area. This is one of the few comprehensive non-Indigenous site-recording programs ever conducted in the region.

The study provides a very localised and detailed history, including oral history, of the properties in the Durham Downs area, combined with the results of an intensive field survey. The sites recorded during this study, and found in the study area are listed in Table 2.

Archaeo Cultural Heritage Services 2009 Non-Indigenous Cultural Heritage Investigation for the Gladstone GLNG Project.

This study examined the non-Indigenous cultural heritage for the Gladstone LNG project. Although the pipeline has been routed to the west of the present study area, gas field developments in the vicinity of the Australia Pacific LNG project have led to the documentation of items of non-Indigenous cultural heritage.

Identified sites include: the Wallumbilla and Yuleba historic precincts, a timber homestead north of Wallumbilla, a section of the abandoned Dalby – Roma telegraph line and Old Ulebah township. These sites are listed in Table 2.

Central Queensland Cultural Heritage Management Pty Ltd 2009 Non-Indigenous Cultural Heritage. Surat to Gladstone Pipeline Project.

This study formed part of the assessment of environmental impacts of construction of the parallel gas transmission pipeline for the Surat – Gladstone Pipeline Project. The alignment crosses the gas field from near Kogan crossing the gas field in a northwesterly direction to north of Miles. Eight non-Indigenous heritage sites were identified during field surveys along the pipeline route. All are of local heritage significance or historical interest, although some are likely to be of recent origin and not historically significant. The eight sites are listed in Table 2.

ERM Australia 2009 Cultural Heritage report for the Queensland Curtis LNG Project

Although only a limited field survey was conducted as part of the assessment of construction impacts of the parallel gas scheme, a small number of sites were identified, and recorded summarily. Sites were primarily located in the area to the south of Chinchilla. Most of the recorded sites are buildings and are listed in Table 2.

Xstrata 2008 Wandoan Coal Project

This study was conducted in coalfields to the west of Wandoan. The Xstrata study area is situated at the northern end of the Australia Pacific gas field. A number of sites were identified during the field investigation. These are associated with the earliest settlement in the region, later closer settlement, and land survey. The sites, with the exception of Juandah Station, recorded on the QHR and of State heritage significance, were assessed as having local significance. The sites are listed in Table 2.

Xstrata 2008 Wandoan Coal Project Water Supply Impact Assessment

This study investigated non-Indigenous cultural heritage along a water pipeline corridor from the Wandoan Coalfield to the Condamine Power Station, east of Miles. Six sites were located along the route as a result of field survey. These were the former site of the Giligulgal State School, a timber

house on private property west of Baileys Road, a stone chimney west of Baileys Road, a telephone pole opposite the stone chimney, a fence at the entrance to Possum Park, previously used during World War 2 as an ammunitions storage facility, and remnants of a low level timber bridge underneath the current concrete bridge at Nine Mile Creek. The location of these sites is shown on a large-scale map, however, coordinates of the sites were not provided so their locations can only be approximated.

Table 3. Australia Pacific LNG gas field sites located during regional heritage studies

Site Name	Location	Description
Durham Downs Homestead	Durham Downs	Dating from the 1880s, this homestead comprises an original 4-room bungalow with verandahs on three of the four sides. The verandahs have cypress floorboards. Unlined walls made from pit-sawn hardwood weatherboards. Extra rooms have been added. Ceilings would originally have been hessian, but are now lined. (Strong 2005)
Durham Downs School house	Durham Downs	Dating from the early 1900s, this is a separate school room, linked to main homestead from verandah. The room is built with weatherboards and has a gabled corrugated iron roof. (Strong 2005)
Durham Downs men's quarters	Durham Downs	Early 1900s single-roomed building with hipped corrugated iron roof, and verandah on northern side. (Strong 2005)
Durham Downs Meat House	Durham Downs	Single roomed, bush timber structure with corrugated iron roof. Walls covered with ant mound on chicken wire frame, and whitewashed. Ceiling treated with similar surface. (Strong 2005)
Wybara Sheep Folds	Wybara	Two sheep folds comprising bush timber and branches. (Strong 2005)
Historical survey tree	Wybara	Dating from the late 19th Century, this scarred box tree has a number "8" or "9" and letter "v" on the exposed heartwood. Tree marked by W.R. Twine, a district surveyor. (Strong 2005)
Flynn's hut	Wybara	Remains of rectangular hut (6x3m) with timber bottom plate resting on sandstone slabs. Historical artefacts including glass and ceramic shards scattered over the site. Dating from 1912 and associated with an orchard and other farm buildings, which no longer exist. (Strong 2005)
Sheep yards and historic fireplace on Bluff Creek	Wybara	Line of stones and hearth with associated mid-19th Century glass and ceramic. 1840-1860s. (Strong 2005)
Sheep yard and shepherd's hut	Wybara	Located on a steep bank above Eurombah Creek. Comprises remains of a shepherd's hut with postholes and frame. Artefacts include 19th Century

Site Name	Location	Description
		glass and transfer printed ceramic and brass bullet cases c.1860. (Strong 2005)
Brumby Trap	Spring Gully	Brumby trap made from bush timber and fencing wire to guide horses into a yard. Located on high ridge above Spring Gully. Dating from the early 1900s. (Strong 2005)
Dray Road	Echo Hills	Dating from the late 1800s, this dray route from Roma to Taroom crossed Slatehill Creek. (Strong 2005)
Cattle Ramp	Lighthouse	Dating from about 1904, this ramp made with sandstone slabs and three rows of bush timber uprights, has been built into a dam. (Strong 2005)
Box Gully stockman's camp	Meeleebee Downs	Campsite for stockmen when mustering in the period 1904-1940s. Site contains a hut and campsite, with no visible historical traces. (Strong 2005)
Graves	Pony Hills	Two graves, the oldest that of William Robert Hallett, the first owner of Pony Hills, who died in 1941, the second is of Hallett Wade Henricks, who died accidentally in 1971. (Strong 2005)
Men's quarters	Pony Hills	Rectangular building with added skillion roof, probably dating from 1920s. (Strong 2005)
Smoke house	Pony Hills	Dating from the early 1900s, this structure comprises a chimney and corrugated iron roof. It has been converted to a hen house with chicken wire. (Strong 2005)
Wallumbilla precinct	On railway between Miles and Roma	Originally a small settlement that sprang up on Wallumbilla Creek, it grew as a local service centre with the arrival of the railway in 1880. The town contains the State Heritage Listed Nostalgic Queen's Theatre, built in 1939. The large grain shed located beside the rail line. (Archaeo Cultural Heritage Services 2009)
Yuleba precinct	On railway route between Miles and Roma	The township of Yuleba was relocated from an earlier settlement 11km to the south, with the arrival of the railway in 1879. The town was laid out on a grid pattern. (Archaeo Cultural Heritage Services 2009)
Timber homesteads	2.6km and 3.2km north of Wallumbilla	Two wooden homesteads are located north of the town. These are in a poor state of repair, although

Site Name	Location	Description
		the southern-most building has been restumped and has a new corrugated iron roof. (Archaeo Cultural Heritage Services 2009)
Dalby – Roma telegraph line	Located approximately 6.5km south west of Yulebah on Mongool Road	Cypress pine poles, spaced at approximately 50m intervals, with cross bars holding porcelain insulators. The alignment follows the road for approximately 1.3km. (Archaeo Cultural Heritage Services 2009)
Old Ulebah township		This is the site of the former township that was relocated when the main western railway was built in 1879. It had been on an early coach route. The town site has exotic plantings and large artefact scatters the junction of Condamine and Como Roads. Artefacts include glass and ceramic, nails, buttons and glass. The town allotments still remain on cadastral maps. (Archaeo Cultural Heritage Services 2009)
Scarred tree (SGP Site 1)	Beside Dalby – Kogan Road, 14.5km east of Kogan.	Dead tree with single scarf scar about 800mm above ground made with metal axe. (Central Queensland Heritage Management 2009)
Sleeper Cutting Camp (SGP Site 2)	In forest, 4.05km north of Kogan.	Site contains offcuts, completed sleepers and stockpiled logs. Relatively recent activity area. (Central Queensland Heritage Management 2009)
Old Rugged Cross Shooters Camp (SGP Site 3)	In forest 5.2km north of Kogan.	Shooters camp with bush timber framed shelter and galvanised iron roof. Recent use and origin. (Central Queensland Heritage Management 2009)
North Kogan Machinery Dump (SGP Site 4)	4km north of Kogan – Condamine Road.	Farm machinery dump containing large harrow, three incomplete SEFT tractors and stick rake. (Central Queensland Heritage Management 2009)
Scarred tree (SGP Site 5)	5.8km northeast of Kogan – Condamine	Blazed casuarina tree with additional recent chainsaw scar. (Central Queensland Heritage Management 2009)
Scarred tree (SGP Site 6)	Located 1.4km southeast of Chinchilla – Tara Road.	Scarred poplar box tree, with relatively recent blaze. (Central Queensland Heritage Management 2009)
Water tank (SGP Site 7)	Located 940m southeast of Chinchilla – Tara Road	Derelict galvanised, corrugated iron water tank on stacked log tank stand. Associated lengths of pump rods and star pickets that once supported a trough. (Central Queensland Heritage Management 2009)
Unity Provisional School Site (SGP Site 8)	Located 4.5km south of Warrego Highway on Lees Road	Site of school that operated from 1922 to 1930. Although the building has been removed, archaeological traces are likely to exist in this

Site Name	Location	Description
		location. (Central Queensland Heritage Management 2009)
Murilla Shire Aerodrome QGC Site GFNICH01	2.5km south of Miles	Weatherboard terminal building with low-pitched corrugated, galvanized iron roof. Post – WWII construction. (ERM 2009)
Sixteen Mile Creek Causeway QGC Site GFNICH02	On Avenue Road crossing Wambo Creek, approximately 300m north of junction with the Kogan – Condamine Road.	Stone pitched causeway with bituminised surface. Late 20th Century construction. (ERM 2009)
Garage QGC Site GFNICH03	On edge of Kogan – Chinchilla Road and junction with Chinchilla – Sixteen Mile Road.	Rustic weatherboard garage with rusting, low-pitched corrugated iron roof. (ERM 2009)
Hopeland Church of Christ Hall QGC Site GFNICH04	Chinchilla – Kogan Road	Rectangular plan hall built from weatherboards with a gabled corrugated iron roof. An annexe has been built on the southern side of the building. (ERM 2009)
Hopeland State School QGC Site GFNICH05	Chinchilla – Kogan Road, at intersection with Hopeland School Road	This school opened at Hopeland in 1937 and remains in use. It comprises a two-storey timber structure with galvanised corrugated iron roof. It has been extended and other structures have been built at the site in the 1950s, 1970s and 1990s. (ERM 2009)
Building complex and artefact scatter QGC Site GFNICH06	North of Chinchilla – Kogan Road.	The complex comprises five structures located 150m to 250m north of the Kogan - Condamine Road. There are timber yards and an artefact scatter in the road reserve fronting the property. Includes ad small, square timber building with corrugated iron roof, likely to be a meat house. Remnant fence posts and exotic vegetation indicate the presence of removed buildings. Artefacts include glass, ceramic and metal pieces, some of which are late 19th Century. (ERM 2009)
House QGC Site GFNICH07	Montrose Road	Weatherboard bungalow with corrugated iron roof. (ERM 2009)
Woolshed and yard QGC Site GFNICH08	Weilzels Road, Montrose	Rectangular woolshed with hipped roof. Timber yards associated with shed. (ERM 2009)
Boondoola Homestead QGC Site GFNICH09	Weitzels Road, Tara	Weatherboard cottage with surrounding verandah and red painted corrugated iron roof. Associated garage/ shed. (ERM 2009)

Site Name	Location	Description
Old Topwater Homestead QGC Site GFNICH10	Weitzels Road, Tara	Weatherboard cottage with corrugated iron roof and surrounding verandah. Earlier structures are also present on the site in dilapidated condition. (ERM 2009)
Rabbit Fencer's Hut QGC Site GFNICH11	Corner of Steinohrts and Kerrs Road, Kogan	Located near the rabbit proof fence and may have been associated with the maintenance of the fence.
House QGC Site GFNICH12	Weranga North Road	Single storey Queenslander with timber stumps and verandah on western side. (ERM 2009)
Ridgewood Homestead and yards QGC Site GFNICH13	Warenga North Road, 350m from Surat Developmental Road.	A timber structure with rectangular plan and corrugated iron gable roof. Recent construction although associated with Warenga siding. Stockyards are found on the western side of the road. (ERM 2009)
Dairy complex (Wandoan 1)	Approximately 7km north west of Wandoan	Timber, corrugated iron and fibro milk shed, concrete silo platform and bush timber yards, associated with the division of larger grazing selections into small dairy farms. Cows were hand-milked, cream was separated and used at the local butter factory, while skim milk was used to feed calves and pigs. (Xstrata 2008)
House (Wandoan 2)	Approximately 7km north west of Wandoan	Fibro and sawn timber dwelling, with external studs and attached shed, with corrugated iron roof. Bush timber uprights in shed. Demonstrating vernacular architecture in a rural setting. Associated outhouse and chook shed. Dating from first half of 20th Century. (Xstrata 2008)
Shed (Wandoan 3)	Approximately 5.6km north of Wandoan	Storage shed and garage built from sawn timber with timber shuttered windows and corrugated iron roof. Vernacular construction associated with 1950s dairy farm as part of a soldier settlement farm. Derelict vehicle chassis present. (Xstrata 2008)
Telegraph poles (Wandoan 4)	Wandoan Jackson Road/ Grosmont Road	Single upright telegraph poles, made from cypress pine with china or glass insulators. In Camping Reserve and Stock Route. (Xstrata 2008)
Soldier Settlement Roads (Wandoan 5)	Widespread through district	Road system developed as part of the soldier settlement scheme, and reported to be one of the first construction projects undertaken by Theiss Brothers, a Queensland construction company established in 1948. (Xstrata 2008)
Wolobee Creek Bridge (Wandoan 13)	On Wandoan – Jackson Road	Timber bridge with timber pylons, beams and deck. Bitumenised surface. New replacement timber pylon

Site Name	Location	Description
		timbers. (Xstrata 2008)
Wolobee Creek Survey Tree (Wandoan 14)	Beside Wandoan – Jackson Road	Live tree with blaze on which a government arrow, MR and 7 have been carved. Blaze has been painted. Likely to date from the 1950s and associated with closer settlement in the district. (Xstrata 2008)
Juandah Creek Bridge (Wandoan 24)	Juandah Creek, south of homestead	Bridge remnant comprising bush timber pylons in creek bed. (Xstrata 2008)
Wandoan – Jackson Road stock route/ road reserve (Wandoan 25)	Wandoan	The Wandoan – Jackson Road occupies the stock route. An early telegraph line runs across the route and is marked by standing cypress pine posts and several china or glass insulators. (Xstrata 2008)
Wandoan Railway (Wandoan 26)	Royd Street Wandoan	Wandoan railway complex including barracks, goods shed. Station building has been moved to the Cultural Centre on the corner of the Jackson – Wandoan Road and the Leichhardt Highway. Associated with the late 19th Century expansion of the rail network to support local industries. (Xstrata 2008)
Wandoan Cemetery (Wandoan 27)	Wandoan and Leichhardt Highway north of the town.	Three known burial locations are found in the Wandoan area. The earliest are several graves at the Juandah homestead site. An area was set aside in the township to be replaced by the current cemetery located beside the Leichhardt Highway, 5.5km north of the town. (Xstrata 2008)

4. Potential Impacts

At the time of preparation of this review, preliminary plans of the location of facilities in the gas field had been completed. Eight identified sites are within 1km of proposed infield pipeline routes. These are listed in Table 4, with the proximity of the proposed infrastructure and the measures to ensure their protection. All other identified sites are found more than 1km from proposed pipeline and gas field infrastructure developments and would not be affected by construction activities.

Table 4 Sites found within 1km of planned gas field infrastructure identifying significance, proximity to planned infrastructure and proposed mitigation measures

Site Name	Significance	Proximity to development	Protection measures
Telegraph poles (HAS-11)	Low (Local)	<50m from infield pipeline route	Detailed recording and infield pipeline realignment may be necessary, to avoid archaeological traces.
Old Ulebah	High (Local)	100m from infield pipeline route	Detailed recording and infield pipeline realignment may be necessary, to avoid archaeological traces.
Surveyors Camp 2	Low (Local)	120m from infield pipeline route	Detailed recording and infield pipeline realignment may be necessary, to avoid archaeological traces.
Wybara Sheep Folds	Low (Local)	70m from infield pipeline route	Detailed recording and infield pipeline realignment may be necessary, to avoid archaeological traces.
Murilla Shire Aerodrome	Low (Local)	Property boundary 80m from proposed infield pipeline route	Site not threatened by proposed development.
Wambo Creek Causeway	Low (Local)	120m from alternative infield pipeline route	Not threatened by proposed pipeline construction.
Nangram Corduroy Road	Moderate (Local)	50m from infield pipeline route	Detailed recording and infield pipeline realignment may be necessary, to avoid archaeological traces.
Horton Downs Provisional School No. 1148 site	Low (Local)	100m from infield pipeline route	Detailed recording and infield pipeline realignment may be necessary, to avoid archaeological traces.

While impacts from proposed pipelines and plant sites can be predicted, the location of gas wells within the field is presently unknown and therefore other sites may be located near known or as-yet-undiscovered sites. As the first stage in the project, existing heritage sites have been identified in a constraints analysis to assist project facility planning. Known heritage sites have been mapped and

avoided. The sites of greatest significance in the study area are located in towns and settlements; locations where no facilities associated with this project would be built.

The second stage in this heritage assessment and site avoidance process has been the review of the region's history and consultation with knowledgeable individuals and organisations about non-Indigenous heritage sites to identify locations of heritage significance. These sites and locations have been mapped and incorporated into the project planning process to ensure that facilities are placed to avoid sites.

The final stage in the process will be detailed on-site assessment of locations where facilities are planned. This will take place well prior to construction to ensure that non-Indigenous heritage sites can be identified and fully assessed, so that appropriate protection measures can be implemented. These will mostly entail the relocation of wells, facilities and in-field pipelines to ensure avoidance of sites. Further heritage assessment may be required, should it prove that the sites are extensive and avoidance is impossible. This final stage in the process would be undertaken following consultation with the Department of Environment and Resource Management. These measures are detailed in the mitigation and management section of this report (Section 5).

4.1 Potential impacts to undetected sites

While only localised field surveys were undertaken as part of the present investigation, previous studies have confirmed that numerous traces of prior non-Indigenous habitation do exist in the Australia Pacific LNG gas field study area. It is also inevitable that further non-Indigenous sites and heritage places remain undetected. These will mostly be of local heritage significance and will include a wide range of site types associated with the various industries identified in the site history.

Sites that are located during this additional survey will be managed in accordance with a non-Indigenous Cultural Heritage Management Plan formulated in consultation with the Department of Environment and Resource Management.

4.2 Cumulative impacts

In addition to impacts that will arise from construction in the gas field, additional infrastructure in the form of a transmission pipeline is planned at the northern end of the gas field. Flexibility in placement of the pipeline will ensure the protection of yet to be detected non-Indigenous heritage sites.

In addition, to the effects on non-Indigenous heritage sites of construction of the gas field, are the potential effects of several other projects planned by other proponents to the east and west of the Australia Pacific LNG gas field. These other gas field developments could potentially place further non-Indigenous heritage sites at risk, however, these proponents are also managing the heritage in a similar manner, through avoidance of identified sites.

Through avoidance of identified non-Indigenous heritage sites, management of development impacts in the vicinity of these sites, formulation of procedures to deal with sites detected during construction, detailed archival recording of threatened sites, and recovery of information on early non-Indigenous land use, it will be possible to minimise the cumulative effects of development on non-Indigenous sites in this region.

4.3 Matters of National Environmental Significance

Two items with nationally recognised heritage values are found in the area surrounding the gas fields' study area. These sites, listed on the Register of the National Estate, are the Boonarga Cactoblastis

Memorial Hall (RNE 16252 QHR 601273), located 1.6km outside the gas fields' study area and 15.4km from the nearest planned development and Jimbour Station Homestead (RNE 9258, QHR 600941) situated 32km to the east of the study area and 34km from the nearest development. Neither site has been transferred to the National Heritage List, although both are protected by their inclusion on the Queensland Heritage Register. Neither site will be impacted by the proposed works.

5. Mitigation and management

Procedures to be followed to ensure that non-Indigenous heritage sites are protected during construction in the Australia Pacific LNG gas field development will include:

5.1 Design

Field investigation to be conducted prior to construction to document any non-Indigenous heritage sites likely to be impacted.

A heritage management plan will be prepared to manage the potential impacts identified in Table 19.3 as well as any likely impacts identified during field investigations. The heritage management plan will be prepared in consultation with relevant stakeholders, including the Department of Environment and Resource Management as required.

Avoidance, wherever practical, of previously recorded non-Indigenous heritage sites through careful placement of infrastructure.

5.2 Construction and Operation

Heritage management plan will be developed and implemented as required.

Procedures will be put in place to provide for the timely reporting and protection of heritage items and archaeological artefacts discovered during construction, consistent with requirements under the Queensland Heritage Act 1992.

All workers in the gas field will be inducted about the importance of non-Indigenous heritage sites and the procedures to be followed on their discovery.

Assessment of non-Indigenous site significance will be undertaken using criteria established under the Queensland Heritage Act, to determine the appropriate protection measures for identified sites.

There are five options available for the management of development impacts to heritage sites. These encompass: avoidance, relocation, salvage, archival recording and interpretation. In most cases a combination of these measures is the best approach to preserving a site's heritage values. These principles will be followed when deciding on the impact mitigation measures.

1. Avoidance

- a. The simplest means of protecting heritage sites from development impacts entails relocation of facilities so the sites are avoided. Where the sites remain in close proximity to construction activities it may be necessary to erect barriers to protect the site from accidental impacts.

2. Relocation

- a. In some instances where impacts are unavoidable, it may be possible for relocation of the heritage items, either to a nearby area that is not threatened by construction impacts, or to a museum.

3. Salvage

-
- a. Controlled archaeological excavation may be an option for recovery of information and relics from sites threatened by construction impacts. Once the site has been investigated and the information or relics recovered, development proceeds in the site area.
4. Archival recording
 - a. Detailed archival recording of heritage items that are to be impacted by development is a minimum requirement. DERM has guidelines for archival photographic recording and plan drawings for heritage sites to ensure that these records accurately document threatened sites.
5. Interpretation
 - a. Either as part of a salvage and recovery program, or in isolation, the public interpretation of a site likely to be impacted by development can inform the community of the heritage values of sites that might be lost or damaged through development. In some instances, it is possible to incorporate elements of the archaeological features in public displays as part of the development.

5.3 Mitigation of impacts in the LNG gas field

Ideally, all heritage sites would be protected during the development of the Australia Pacific LNG gas field, however, impacts to heritage sites may be unavoidable. At present no sites are threatened, although with the proposed drilling program, there is potential for disturbance of unrecorded sites. These are most likely to be archaeological sites associated with a variety of historical land use practices. To ensure that these are recorded and their heritage values assessed, it will necessary for the following steps to be implemented during construction:

- all work in the vicinity of the suspected heritage site must cease and a temporary buffer of at least 50m established to ensure that impacts are avoided
- the Project Manager and Heritage Department Manager shall be notified
- the Project Archaeologist shall be advised of the finding, and will inspect the suspected heritage items to assess them and ensure that the provisions of Section 89 of the QHA in relation to non-Indigenous archaeological sites are met
- the Project Archaeologist will liaise with officers of DERM, to ensure that the identified heritage items are properly recorded, their significance assessed and appropriate management measures implemented. These measures may include the protection and avoidance of a site; investigation and recording; removal of the heritage items for safekeeping; advice on relocation of facilities; or excavation, removal and curation of the historical items.

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Volume 5: Attachments

Attachment 39: Non-Indigenous Heritage Technical Report – Gas Fields

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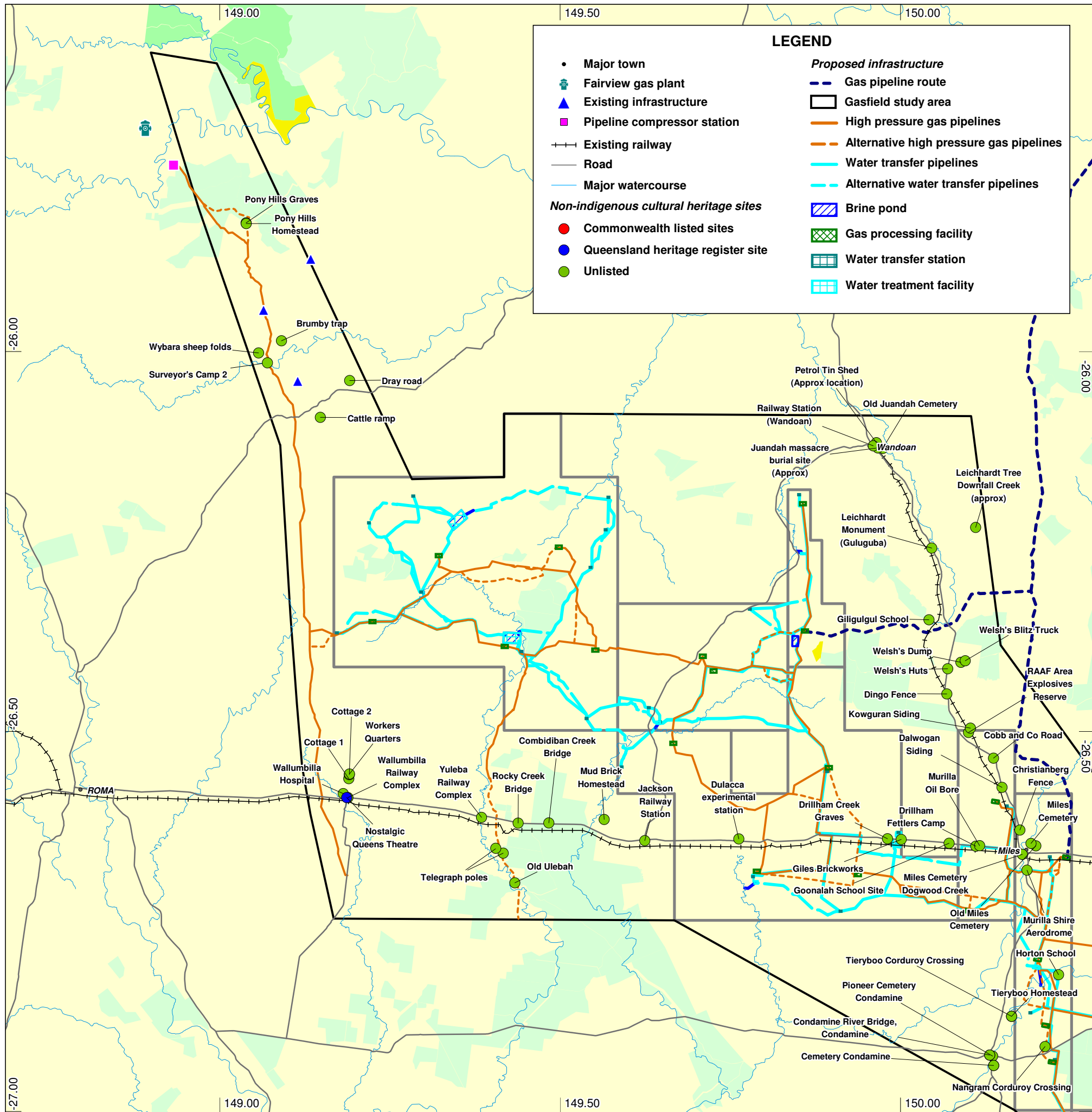
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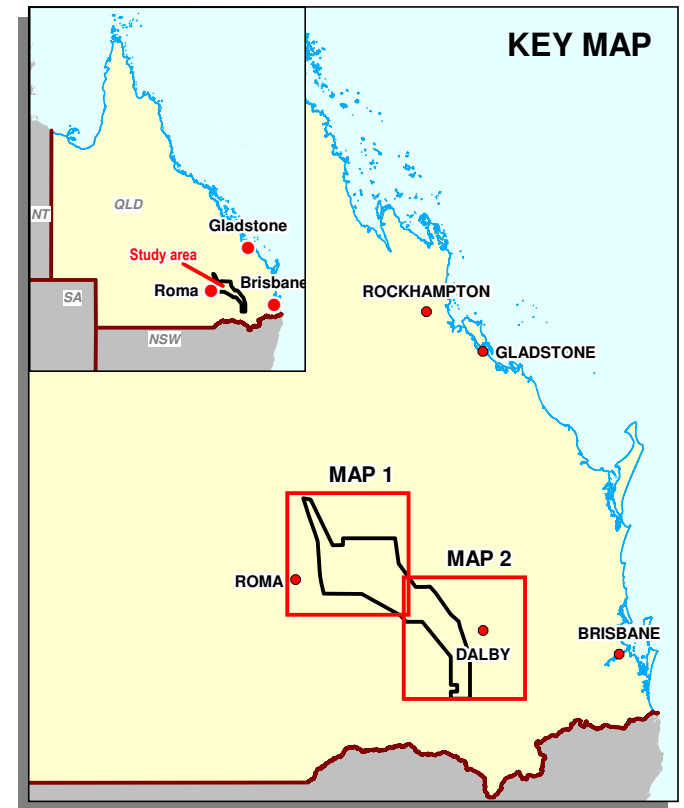
Xstrata 2008 Wandoan Coal Project EIS.

Appendix A Figures



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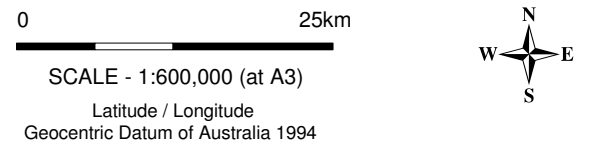
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- ⊞ Fairview gas plant
- ▲ Existing infrastructure
- Pipeline compressor station
- ⊕ Existing railway
- Road
- Major watercourse
- Proposed infrastructure
 - - - Gas pipeline route
 - ▭ Gasfield study area
 - High pressure gas pipelines
 - - - Alternative high pressure gas pipelines
 - Water transfer pipelines
 - - - Alternative water transfer pipelines
 - ▨ Brine pond
 - ▧ Gas processing facility
 - ▩ Water transfer station
 - ▩ Water treatment facility
- Non-indigenous cultural heritage sites
 - Commonwealth listed sites
 - Queensland heritage register site
 - Unlisted



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Preferred pipeline alignment supplied by Origin Energy on 03/11/2009

Non-indigenous cultural heritage site data supplied by Heritage Consulting Australia on 19/11/2009
Additional non-indigenous cultural heritage site data supplied by Heritage Consulting Australia on 08/12/2009 and 19/01/2010

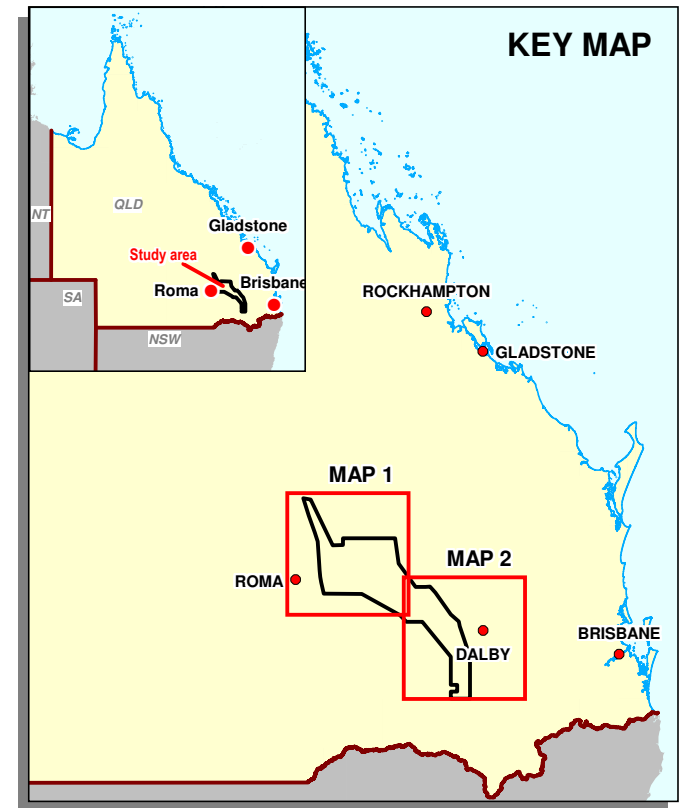
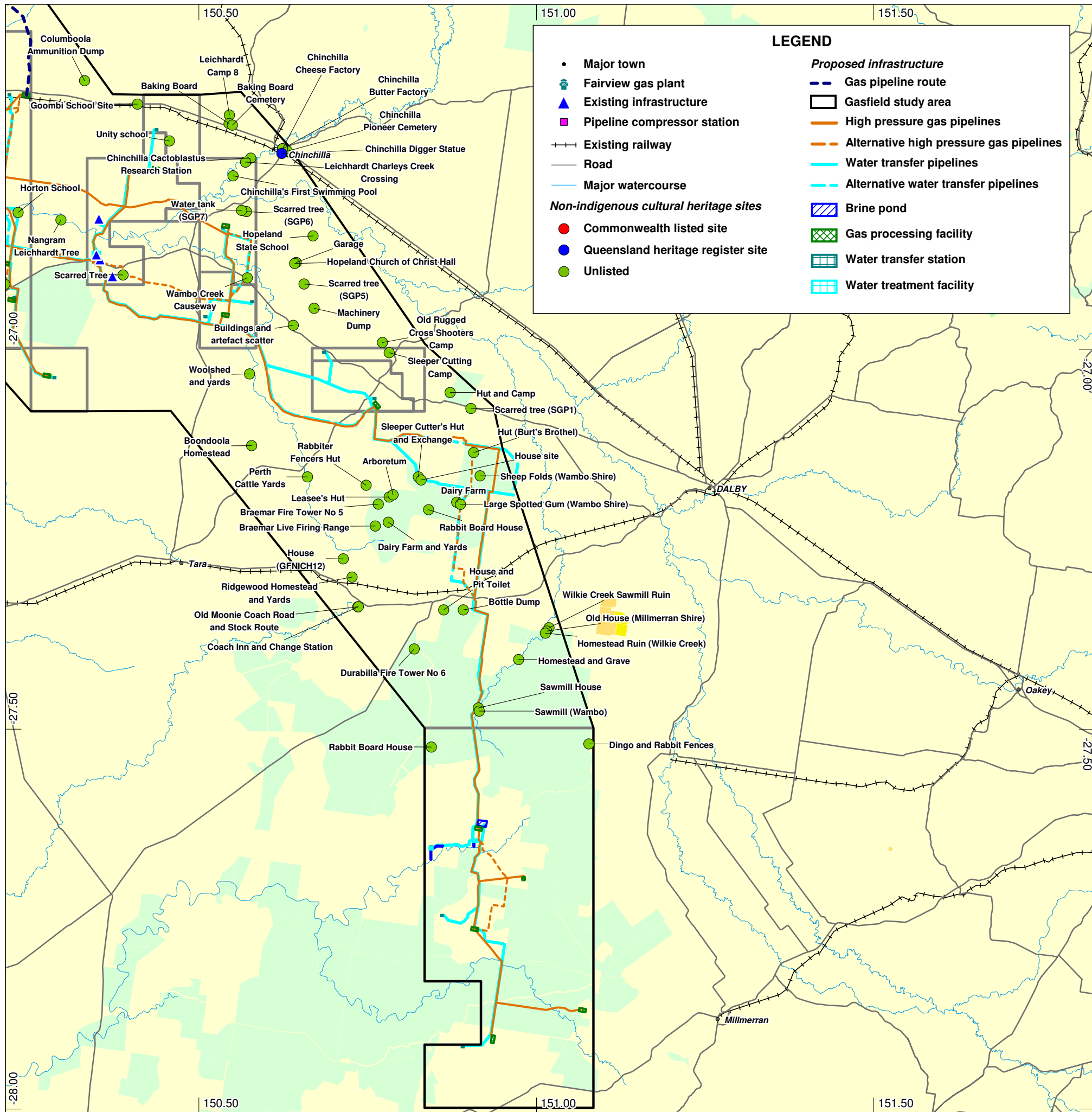


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Figure 1 - Non-indigenous Cultural Heritage Sites
(Map 1 of 2)

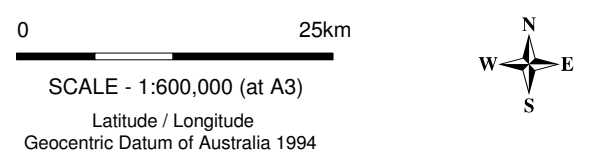
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Preferred pipeline alignment supplied by Origin Energy on 03/11/2009

Non-indigenous cultural heritage site data supplied by Heritage Consulting Australia on 19/11/2009
Additional non-indigenous cultural heritage site data supplied by Heritage Consulting Australia on 08/12/2009



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**AUSTRALIA PACIFIC LNG PROJECT EIS
Figure 2 - Non-indigenous Cultural Heritage Sites
(Map 2 of 2)**

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