Non-indigenous cultural heritage T

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Santos GLNG Gas Field Development Project
Non-Indigenous Cultural Heritage Assessment

October 2014



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Executive Summary

Converge Heritage + Community (Converge) has been commissioned to prepare a report that details baseline information, results and recommendations of the non-Indigenous cultural heritage (NICH) assessment for the Santos GLNG Gas Field Development Project (the GFD Project). This technical report will inform the heritage sections of the environmental impact statement (EIS).

The Terms of reference (ToR) for the GFD Project require that direct, indirect and cumulative impacts are fully examined and addressed and that the GFD Project should be based on sound environmental protection and management criteria. The approach for this investigation was developed from the requirements of the ToR and the relevant industry best practice guidelines. It also takes into consideration the incremental and dispersed nature of the gas field development over a project life exceeding more than 30 years.

The aims of the historical cultural heritage investigation were to:

- Address the ToR.
- Define known historical heritage places in or in close proximity to the GFD Project area.
- Assess the potential of the GFD Project area to contain further unknown heritage places.
- Assess and quantify potential impacts on historical heritage places resulting from implementation of the GFD Project.
- Provide appropriate recommendations so that the values of historical heritage places are managed during the construction and post-construction phases of the GFD Project.

Summary of Findings

Over 160 known NICH places (precincts and individual places) were identified within the GFD Project area. These include:

- Thirty-nine places identified on statutory registers of which all but Fraser Family Grave and Memorial Hornet Bank, which is located on the Queensland Heritage Register (QHR) ID 602075, are located within towns and are unlikely to be impacted by the GFD Project.
- Ninety places on non-statutory registers which may require further management or mitigation.
- Thirty-four places assessed by previous assessments as likely to threshold for local heritage significance which may require further management or mitigation.

A small proportion of these places are duplicated across the various statutory, non-statutory registers and previous assessments. Details in relation to known NICH are set out in Section 3.

Many of the places on the non-statutory registers have not been assessed against specific cultural heritage criteria and their significance requires assessment and/or verification in light of the provisions of the *Queensland Heritage Act 1992* (QH Act). They do, however, provide an indication of the types of cultural heritage places and heritage themes that may be currently unidentified within the GFD Project area. Some of these known and unknown places may require management through the life of the Project.

NICH places in areas of interest generally relate to pastoral and settlement activities, such as, homesteads and associated agricultural buildings, historic survey trees, roads and stock routes remnant boundary fence lines, old station dumps and the remains of early mining activities. Other types of historic places and places such as historic town precincts, cemeteries, remote graves, telegraph/telephone lines, mile markers and historic camp remnants and associated exotic vegetation also occur within the GFD Project areas.

Summary of Impacts

This investigation has established that there are known places of NICH significance within the GFD Project area, ranging from, State and local cultural heritage significance, or known places that have not yet been assessed for significance (e.g. many of the EPA listed sites).

Place types represented in the known NICH resource include:

- Explorer's campsites.
- Contact sites including massacre sites and sites showing evidence of Aboriginal and non-Indigenous occupation.
- Pastoral places including homestead complexes (e.g. homesteads, cattle/sheep dips, meat houses, dairies, holding yards, shearing sheds, storage sheds and refuse dumps), fencing, bores, water storage ponds, bush camps, surveyors marks and terracing.
- Isolated graves and cemeteries.
- Historical precincts within towns such as Roma, Surat, Wallumbilla, Old Yulebah and New Yulebah.
- Roads, railways and stock routes and associated telegraph/telephone lines including old road alignments and roads which reflect specific phases of development (e. g. soldier settler roads), railways, sidings, stations and associated settlement and housing.
- Mining and quarrying sites including underground and open-cut mines, oil bores and associated infrastructure.
- Memorials to both early explorers and soldiers.

Additionally, there is potential for further, currently unknown, places of NICH significance within the GFD Project area. These potential places are likely to be similar in type as those identified on the various statutory and non-statutory registers and to vary in cultural heritage significance.

Potential impacts on NICH may arise from the Santos GLNG activities that involve clearing of vegetation, ground disturbance and excavation, off-road vehicle traffic, or not following established processes for protecting cultural heritage e.g. interfering with sites. The potential impacts (both direct and indirect) to be assessed are:

- Impacts on known NICH places of National, State and local significance, and unassessed places.
- Impacts to unknown NICH places of National, State and local significance.
- Impacts to significant NICH landscapes.

The Constraints protocol will be implemented to identify heritage sites as a constraint for the location of GFD Project infrastructure. It will guide the placement of infrastructure in accordance with the following management principles:

- Avoidance — avoiding direct and indirect impacts.
- Minimisation — minimise potential impact
- Mitigation — implement mitigation and management measures to minimise cumulative adverse impacts.
- Remediation and rehabilitation—actively remediate and rehabilitate impacted areas.
- Offset — offset residual adverse impacts in accordance with regulatory requirements.

The constraints approach is based upon the *GFD Project environmental protocol for constraints planning and field development* (Constraints protocol). The Constraints protocol applies to all gas field related activities.

The scope of the Constraints protocol is to:

- Enable Santos GLNG to comply with all relevant State and Federal statutory approvals and legislation;
- Support Santos' environmental policies and the General Environmental Duty (GED) as outlined in the *Environmental Protection Act 1994* (Qld) (EP Act).
- Promote the avoidance, minimisation, mitigation and management of direct and indirect adverse environmental impacts associated with land disturbances; and
- Minimise cumulative impacts on environmental values.

Known heritage places will be incorporated into the Santos GLNG geographical information system (GIS) to assist in identifying the location of GFD Project infrastructure and activities to assist in the ongoing constraints planning and field development process.

After Santos GLNG has identified a potential area for development in accordance with the Constraints protocol, the overarching mechanism for protecting cultural heritage is *Environmental hazard standard* (EHS) *11 Cultural heritage*. EHS 11 defines the processes to avoid, where practicable, or otherwise minimise impacts to cultural heritage from Santos GLNG operations and to ensure that relevant statutory cultural heritage requirements are complied with. EHS 11 is supported by cultural heritage field personnel and a cultural heritage management system.

Once implemented the residual risk to NICH as a result of the GFD Project is assessed to be low to medium. Whilst there are no registered NICH landscapes within the GFD Project area, some potential exists for these to be identified. It is considered that a similar residual risk (low to medium) could result to unknown NICH landscapes, potentially existing in the GFD Project area.

These projects have the potential, when considered together, to change the character of the region (through cumulative impact) and, as cultural heritage is a non-renewable resource, incrementally impact on the number and diversity of cultural heritage places within the GFD Project area.

This report has completed the first stage of assessment required for the GFD Project in relation to the location and management of known and potential NICH places. From this assessment, it is considered that there is a high likelihood for further unknown places of NICH significance to exist within the GFD Project area.

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Glossary of Terms

Term	Definition
Burra Charter	A document outlining best cultural heritage practice principles developed by the International Council on Monuments and Sites, Australia.
Cultural Heritage Precinct	Complex/Cultural heritage site with more than one type of remain.
GFD Project area	Areas of Arcadia, Roma, Fairview and Scotia gas fields and the "Possible area for supporting infrastructure"
Place	Site, area, land, landscape, building or other work, group of buildings or other works, that may include components, contents, spaces and views (Burra Charter 1999: 2).
Significance	Aesthetic, historic, scientific, social or spiritual value for past, present or future generations.
Site	Means archaeological site. An archaeological site is a place (or group of physical sites) in which evidence of past activity is preserved.

Abbreviation	Meaning
ARCHAEO	ARCHAEO Cultural Heritage Services P/L (Converge)
AHC	Australian Heritage Council
AHPI	Australian Heritage Places Inventory
c.	Circa
CHL	Commonwealth Heritage List
Converge	Converge Heritage + Community
EHP	Department of Environment and Heritage Protection
EHS 11	*Santos GLNG's Environmental Hazard Standard 11 Cultural heritage standard*
DME	Queensland Department of Energy and Mines
DOTE	Commonwealth Department of the Environment
EHS11 Cultural heritage	*Environmental Hazard Standard (EHS) 11 Cultural heritage standard*
EIS	Environment Impact Statement
EPA	*Environment Protection Act 1994* (Qld)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
EMP	Environment Management Plan
GFD Project	Gas Field Development Project
GLNG Project	Gladstone liquid natural gas project
HHMP	Historic heritage management plan
ICOMOS	International Council On Monuments and Sites
IDAS	Integrated development application system
IRTM	Interactive resource and tenure map
JOL	John Oxley library
km^2	Square kilometres
LHR	Local Heritage Register
LGA	Local Government Authority
NHL	National Heritage List
QH Act	*Queensland Heritage Act 1992*
QHC	Queensland Heritage Council
QNT	Queensland Branch of the National Trust
QHR	Queensland Heritage Register
RNE	(Former) Register of the National Estate
SEWPaC	Former Commonwealth Department of Sustainability, Environment, Water, Population and Communities
SPA	*Sustainable Planning Act 2009* (Qld)
ToR	Terms of reference
UNESCO	United Nations Educational, Scientific and Cultural Organization
WHL	World Heritage List

1 Introduction

Converge Heritage + Community (Converge) have been commissioned by URS Australia Pty Ltd (URS) to undertake a non-Indigenous cultural heritage (NICH) assessment for the Santos GLNG Gas Field Development Project (the GFD Project) as part of the environmental impact statement (EIS).

1.1 Purpose

The Terms of reference (ToR) for the GFD Project require that direct, indirect and cumulative impacts are fully examined and addressed and that the GFD Project should be based on sound environmental protection and management criteria. The approach for this investigation was developed from the requirements of the ToR and the relevant industry best practice guidelines. It also takes into consideration the incremental and dispersed nature of the gas field development over a project life exceeding more than 30 years.

The aims of the NICH investigation were to:

- Address the ToR.
- Define known heritage places in or in close proximity to the GFD Project area.
- Assess the potential of the GFD Project area to contain further unknown heritage places.
- Assess and quantify potential impacts on heritage places resulting from implementation of the GFD Project.
- Provide appropriate recommendations so that the values of heritage places are managed during the construction and post-construction phases of the GFD Project.

The historic and archaeological record is both fragile and non-renewable. Disturbance of the environment poses a potential threat to this cultural resource.

This report presents the results of the NICH assessment, and includes:

- A summary of the history and environment of the GFD Project tenements and possible area for supporting infrastructure which comprise the GFD Project area.
- The results of the previously targeted NICH field assessments undertaken for this and other projects.
- The nature of NICH significance within the GFD Project area.
- The potential impacts of the GFD Project on NICH.
- The cumulative impacts of this and other projects in the region on NICH.
- Specific management recommendations for the protection of potential areas of NICH significance.

For the purpose of th is desktop assessment the study area was defined as the “Possible area for supporting infrastructure” identified in Figure 1.

1.2 Project Description

Santos GLNG intends to further develop its Queensland gas resources to augment supply of natural gas to its existing and previously approved Gladstone Liquefied Natural Gas (GLNG) Project.

The Santos GLNG Gas Field Development Project (the GFD Project) is an extension of the existing approved gas field development and will involve the construction, operation, decommissioning and rehabilitation of production wells and the associated supporting infrastructure needed to provide additional gas over a project life exceeding 30 years.

Specifically, the GFD Project seeks approval to expand the GLNG Project's gas fields tenure from 6,887 km^2 to 10,676 km^2 to develop up to 6,100 production wells beyond the currently authorised 2,650 wells; resulting in a maximum of up to 8,750 production wells. The GFD Project will continue to progressively develop the Arcadia, Fairview, Roma and Scotia gas fields across 35 Santos GLNG petroleum tenures in the Surat and Bowen basins, and associated supporting infrastructure in these tenures and adjacent areas. The location of the GFD Project area and primary infrastructure is shown on Figure 1.

This GFD Project will include the following components:

- Production wells
- Fluid injection wells, monitoring bores and potentially underground gas storage wells
- Gas and water gathering lines
- Gas and water transmission pipelines
- Gas compression and treatment facilities
- Water storage and management facilities
- Access roads and tracks
- Accommodation facilities and associated services (e.g. sewage treatment)
- Maintenance facilities, workshops, construction support, warehousing and administration buildings
- Utilities such as water and power generation and supply (overhead and/or underground)
- Laydown, stockpile and storage areas
- Borrow pits and quarries
- Communications.

The final number, size and location of the components will be determined progressively over the GFD Project life and will be influenced by the location, size and quality of the gas resources identified through ongoing field development planning processes, which include consideration of land access agreements negotiated with landholders, and environmental and cultural heritage values.

Where practicable, the GFD Project will utilise existing or already approved infrastructure (e.g. accommodation camps, gas compression and water management facilities) from the GLNG Project or other separately approved developments. The GFD Project may also involve sourcing gas from third-party suppliers, as well as the sharing or co-location of gas field and associated facilities with third parties.

For the purposes of transparency the EIS shows an area off-tenure that may be used for infrastructure such as pipelines and temporary camps (supporting infrastructure area). While not assessed specifically in this EIS, any infrastructure that may be located within this area would be subject to further approval processes separate to this EIS.

Approved exploration and appraisal activities are currently underway across the GFD Project's petroleum tenures to improve understanding of the available gas resources. As the understanding of gas resources increases, investment decisions will be made about the scale, location and timing of the next stages of field development.

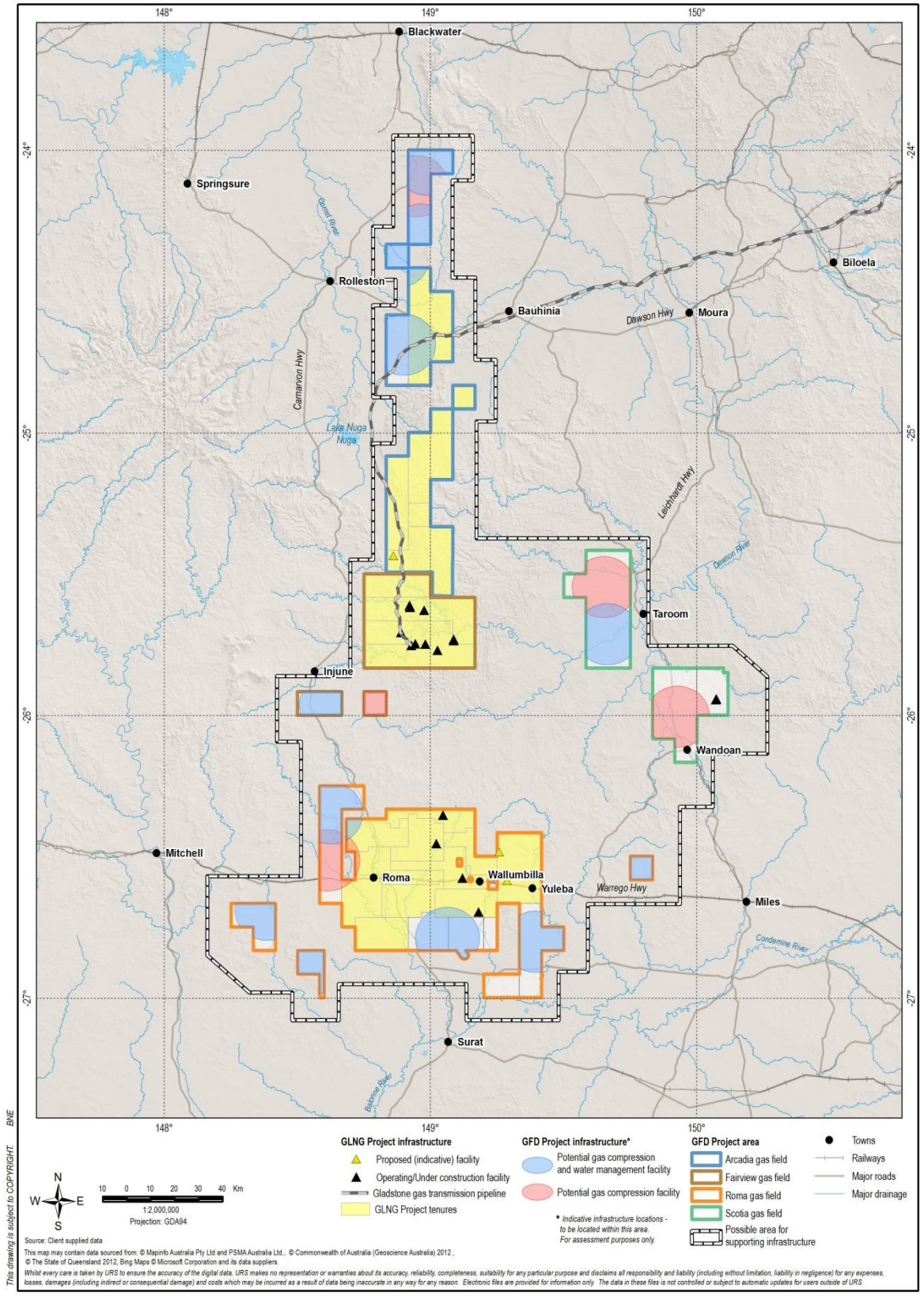

Figure 1: GFD Project area (Source: URS, 2014; File No: 42627064-g-1051b.mxd)

For the purposes of this EIS, a scenario based on the maximum development case was developed at the approval of the ToR. This scenario assumed that production from the wells and upgrading of the gas compression facilities in the Scotia gas field would commence in 2016, followed by the GFD Project wells in the Roma, Arcadia and Fairview gas fields in mid-2019. This schedule is indicative only and was used for the purpose of the impact assessment in this EIS.

The potential GFD Project schedule is outlined in Figure 2. This schedule provides an overall field development scenario for the purposes of assessment in this EIS.

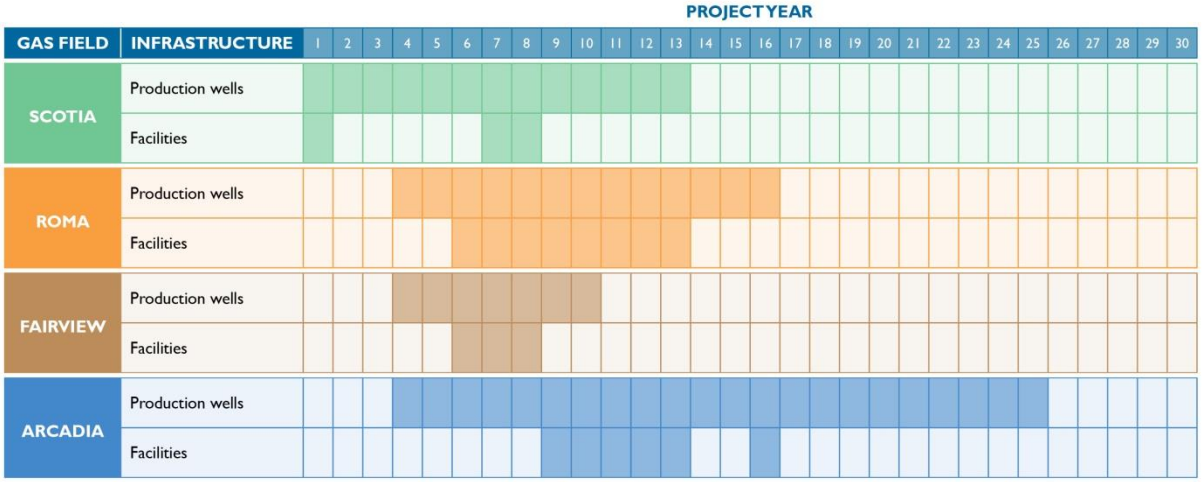

Figure 2: Proposed GFD Project development schedule

Decommissioning and rehabilitation will occur progressively throughout the life of the GFD Project as construction activities cease and exhausted gas wells are decommissioned. Final decommissioning and rehabilitation will occur at the end of gas production in accordance with relevant approvals and regulatory requirements.

1.3 Assessment Methodology

This NICH assessment largely comprises an update of an earlier historic cultural heritage investigation undertaken in 2009 by ARCHAEO Cultural Heritage Services (ARCHAEO) for the existing approved GLNG Project, which is a subset of the GFD Project area. The 2009 assessment was undertaken for 6,887 km^2 of the GLNG Project gas fields, the 420 km Gladstone gas transmission pipeline corridor and LNG export facility located on Curtis Island, Gladstone.

Updated contextual research was undertaken to determine the existence, extent and probable levels of NICH significance of the GFD Project area as well as a review of prior targeted field surveys of part of the area.

1.3.1 Desktop assessment

This report comprises of desktop assessment only, which was undertaken in order to:

- Prepare a brief contextual history for the GFD Project area.
- Assess the existence, extent and significance of those places previously identified within the
- GFD Project area.
- Assess the existence, extent and probable levels of significance of additional (potential) places likely to be located within the GFD Project area.

Searches of statutory and non-statutory registers and databases were updated, and a review of existing published and unpublished reports, surveys and assessments of the area within and in the immediate vicinity of the GFD Project area undertaken. As the precise location of heritage places is not always indicated in the register, an expanded spatial search criterion was used as detailed in Table 1.

Table 1: Spatial area – cultural heritage register search

Jurisdiction	Register/source	Area
National and international	World Heritage List, National Heritage List and the Commonwealth Heritage List	GFD Project area
State	Queensland Heritage Register, Nature Conservation Act 1992 (Qld)	GFD Project area + 10 km buffer
Local	Local heritage registers (Taroom Shire, Bauhinia Shire, Duaringa Shire, Bendemere Shire, Bungul Shire and Roma Town Council)	GFD Project area + 5 km buffer

1.3.2 Consultation

This report was able to draw on consultation undertaken by previous consultancies, specifically the report prepared by ARCHAEO in 2009, which covered approximately two-thirds of the current GFD Project area. This included the circulation of landowner questionnaires by Santos GLNG. The questionnaires briefly described why and how the cultural heritage investigation was being undertaken and discussed the types of heritage places that may be within the project area. The questionnaire provided opportunity for the landowner's assistance in identifying places of potential value, through the provision of basic project information. No feedback was received although subsequent discussion with landowners by members of the field team provided useful information regarding potential places and their value to the community.

The previous field survey teams (ARCHAEO 2009) met with, or spoke to, several of the local historical societies in the GLNG Project area, including:

- Roma Historical Society – provided useful information on the Injune – Roma Railway line and collaborative projects that are underway with the Injune and Mitchell Historical Societies with regard to cultural heritage places in private properties within the region. With more time and consultation, this historical society is likely to be able to provide further information on specific places in the region and their value to the local people.
- Calliope Historical Society – were unaware of any places within the GLNG Project area. Santos GLNG has also distributed fact sheets to historical societies in the region.

Regional councils and government agencies have been part of a widespread regional stakeholder consultation program.

1.3.3 Assessing cultural heritage significance

A range of standards and criteria are available to assist with assessing cultural heritage significance in the region of the GFD Project. This assessment follows the process recommended by the Australia International Council on Monuments and Sites (ICOMOS) as outlined in *The Burra Charter* (1999) and specific criteria for assessing the cultural significance of heritage places in the *Queensland Heritage Act 1992* (QH Act).

The Burra Charter

The Queensland Heritage Council (QHC) (January 2005) adopted *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance* (1999) (and associated Guidelines) as a guiding policy document for making decisions under the QH Act.

The Burra Charter is the best practice standard for cultural heritage assessment in Australia, and provides guidance on applicable criteria for assessment of the significance of cultural heritage places, objects and values. It defines cultural significance as 'aesthetic, historic, scientific or social value for past, present and future generations' and goes onto state 'cultural significance is embodied in the place itself, its fabric, setting, use, associations, meanings, records, related places and related objects' (ICOMOS, 1997).

Australia ICOMOS is currently updating associated guidelines with the aim of completing a consistent suite of documents as part of a review of the Charter itself.

Queensland Heritage Act 1992

The QH Act outlines specific criteria for assessing the cultural significance of heritage places, including landscapes. Under Section 35 (1) of the Act, a place may be entered into the register if it satisfies one or more of the following criteria:

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

In addition, a place may be entered in the Queensland Heritage Register (QHR) as an archaeological place if the place:

a) Is not a State heritage place.
b) Has potential to contain an archaeological artefact that is an important source of information about Queensland's history.

It is a requirement under section 89 of the QH Act that a person advises the Queensland Department of Environment and Heritage Protection (EHP) of an archaeological artefact that is an important source of information about an aspect of Queensland's history. This advice must be given as soon as practicable after the person discovers the item.

These sections of the Act, in conjunction with EHP's publication: *Using the Criteria: a methodology* (2006), were applied during ARCHAEO's 2009 fieldwork to assist in assessing the cultural heritage significance of the places in the area. *Using the Criteria: a methodology* (EHP, 2006) also provides

guidelines to assist in assessing which level of cultural heritage significance is applicable to a place or site and provides the following definitions:

> *A place is of local cultural heritage significance if its heritage values are of a purely localised nature and do not contribute significantly to our understanding of the wider pattern and evolution of Queensland's history and heritage…*
>
> *A place is of state cultural heritage significance if its heritage values contribute to our understanding of the wider pattern and evolution of Queensland's history and heritage. This includes places that contribute significantly to our understanding of the regional pattern and development of Queensland (2006:5).*

Threshold indicators as set out in *Using the Criteria: a methodology* (EHP, 2006) were used to assess the level of cultural heritage significance within each criterion. A summary of these indicators is identified in Table 2.

Table 2: Threshold indicators for cultural heritage

Criterion	Threshold Indicator
a	Regional importance; earliness; representativeness; distinctiveness; exceptionality; rarity.
b	Intactness/integrity; distinctiveness; exceptionality.
c	Earliness; rarity; extensiveness; intactness.
d	Intactness/integrity; earliness; rarity/uncommonness; exceptionality.
e	Intactness; integrity; degree of deterioration; setting and location context; demonstrated representation.
f	Intactness/integrity; peer recognition/award.
g	Length of association; demonstrated extent and degree of community association; significant former association.
h	Importance of the person, group or organisation in Queensland's history; degree or extent of the association; length of association; influence of the association.

2 Legislation and Policy Framework

2.1.1 National

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the key national heritage legislation). This Act provides a number of statutory and legislative controls for heritage places.

In addition, the following legislation is relevant to national heritage:

- The Australian *Heritage Council Act 2003 provides* for the establishment of the Australian Heritage Council (AHC), which is the principal advisory group to the Australian Government on heritage matters.
- The *Protection of Moveable Cultural Heritage Act 1986* regulates the export of Australia's significant cultural heritage objects. The Act does not restrict normal and legitimate trade in cultural property and does not affect an individual's right to own or sell within Australia.

2.1.2 Queensland

In Queensland, places of State heritage significance are managed under the QH Act. The QH Act provides for the conservation of Queensland's cultural heritage for the benefit of the community and future generations. Administered by EHP, the QH Act sets out a framework for identifying and protecting heritage places by:

- Establishing the QHC i.e. an independent statutory authority which provides advice to the Queensland Government on strategic and high priority matters relating to Queensland's heritage, and decides which places are entered in or removed from the QHR.
- Keeping the QHR as a list of Queensland's significant heritage places, and providing a process for assessing applications to the QHR.

Under the provisions of the QH Act, each local government must keep and manage a local heritage register, or have a heritage overlay in its planning scheme. Local heritage registers identify places of local heritage significance.

A number of other Acts and regulations make passing mention of cultural heritage and/or have relevance in some instances in a NICH assessment. These include:

- *The Land Protection (Pest and Stock Route Management) Regulation 2003* (Qld), which identifies cultural heritage as a consideration in the use of a stock route.
- *The Coroners Act 2003 (*Qld), which has relevance in the circumstance of the discovery of human remains.
- *The Nature Conservation Act 1992* (Qld), which includes management of cultural heritage values including NICH in the management principles of declared places under this Act.
- *The Survey and Mapping Infrastructure Act 2003* (Qld) deals with the preservation of survey marks.

2.1.3 Local

Local heritage places are managed under Part 11 of the QH Act, local planning schemes and the *Sustainable Planning Act 2009* (Qld).

The GFD Project area is located within the Western Downs, Maranoa, Banana and Central Highlands local government areas (LGA). However, at present the former shire council planning schemes remain in effect. The GFD Project area is located in the former LGA of Taroom Shire, Bauhinia Shire, Duaringa Shire, Bendemere Shire, Bungul Shire and Roma Town Council.

2.2 Santos GLNG Policy Framework

As an established gas field operator, Santos GLNG has developed a management framework to be implemented during field planning and development. Specific to cultural heritage, the management framework includes Santos GLNG's *GFD Project Environmental protocol for constraints planning and field development* (2014)(Constraints protocol), and corporate environmental, health, safety and community policies, which are supported by its Environment, health and safety management system, including *Environmental hazard standard* (EHS) *11 Cultural heritage.*

2.2.1 Environmental protocol for constraints planning and field development

The Constraints protocol outlines the approach that Santos GLNG will take in identifying, assessing and managing potential impacts on environmental values during field planning across the GFD Project. The Constraints protocol will be implemented to identify sites of cultural significance as a constraint for the location of GFD Project infrastructure. It will guide the placement of infrastructure in accordance with the following management principles:

- Avoidance — avoiding direct and indirect impacts.
- Minimisation — minimise potential impact.
- Mitigation — implement mitigation and management measures to minimise cumulative adverse impacts.
- Remediation and rehabilitation—actively remediate and rehabilitate impacted areas.
- Offset — offset residual adverse impacts in accordance with regulatory requirements.

Consistent with Santos GLNG's environmental management hierarchy, the Constraints protocol prioritises avoidance of environmental impact during field planning by identifying those areas that are not amenable to development. This includes areas of high environmental value as identified in regulatory frameworks and Santos GLNG's baseline surveys. For areas that are considered appropriate to develop, Santos GLNG will identify impacts to environmental values that could potentially occur due to the construction, operations and decommissioning activities of the GFD Project, and determine pre-mitigated impacts (i.e. those that would occur without mitigation).

Relevant mitigation and management measures based on the approved environmental management framework already implemented for the GLNG Project are then applied to the pre-mitigated impacts to identify the mitigated (residual) impacts. This process increases certainty about potential impacts by identifying those areas that are not amenable to development, and for those areas where development could occur, how development should proceed.

The post-EIS field development process is a continuation of the field planning process and will be ongoing throughout the life of the GFD Project. The field development process will inform the GFD Project's design, together with a range of other factors including technical feasibility, cost and risk as required by standards applicable to the design, construction, operations, decommissioning and rehabilitation of gas developments. This information will be used to support the subsequent approvals process such as environmental approval application and the plan of operations.

The tasks involved in the field development process are summarised in Figure 2.

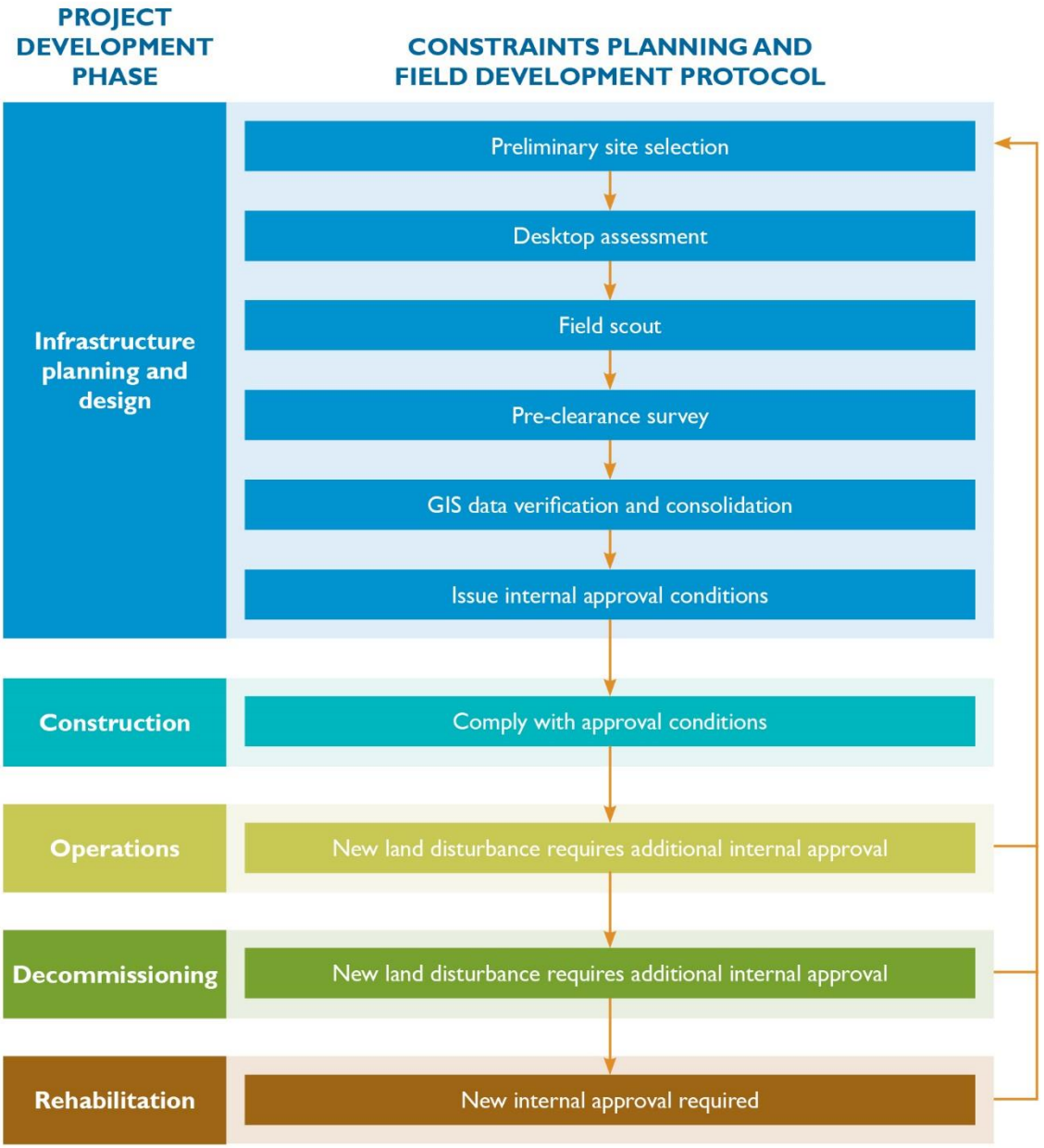

Figure 3: Field development processes

2.2.2 EHS11 Cultural heritage

The overarching mechanism for protecting cultural heritage is *EHS 11*. EHS 11 defines the processes to avoid, where practicable, or otherwise minimise impacts to cultural heritage from Santos GLNG operations and to ensure that relevant statutory cultural heritage requirements are complied with. EHS 11 is supported by cultural heritage field personnel and a cultural heritage management system. Implementation of EHS 11 will identify and avoid, where practicable, or otherwise minimise impacts on cultural heritage places through awareness training, pre-clearance surveys to verify values, inform siting decisions, provides procedures for discovery, clearances and monitoring and reporting.

3 Review of Existing Environment

The following section discusses national, State and local government legislation relevant to NICH sites and places. Searches of the relevant statutory registers associated with national, state and local legislation were undertaken. Places included on these registers generally possess an established level of significance. The absence of a place on these registers is likely to imply that its significance has not been considered to date and does not mean it is without heritage significance.

3.1 Statutory searches

3.1.1 World Heritage List

An online search of the World Heritage List (WHL) was conducted to identify places of cultural heritage significance located within the GFD Project area. The WHL is compiled by United Nations Educational, Scientific and Cultural Organisation (UNESCO) and is an inventory of places considered to have outstanding universal value.

No places were identified on the WHL within the GFD Project area.

3.1.2 National

The EPBC Act is the key national heritage legislation and is administered by DOTE. This Act provides a number of statutory and legislative controls for heritage places. Places of national heritage value and those owned or managed by the Commonwealth are located on the National Heritage List (NHL) and Commonwealth Heritage List (CHL) respectively.

No places were identified on the NHL and CHL within the GFD Project area.

3.1.3 Queensland

In Queensland, the QH Act provides for the establishment of the QHC and the QHR, which lists places of cultural heritage significance to Queensland and regulates development of these registered places. A place may be entered in the register if it satisfies one or more of the assessment criteria described in section 1.3.3. Development of a place listed on the QHR must be carried out in accordance with the QH Act.

The QH Act also applies to potential archaeological places. Under section 60, a place may be considered to be an 'archaeological place' if not registered as a State heritage place and demonstrates 'potential to contain an archaeological artefact that is an important source of information about Queensland's history'. Archaeological places can be entered onto the QHR if they meet those criteria (see section 1.3.3).

Eleven (11) places within of the GFD Project area are currently identified on the QHR.

Table 3: Places identified on the QHR

QHR No.	Place name	Address	Town	LGA
600835	Leichhardt Tree	Yaldwyn Street	Taroom	Banana
602075	Fraser family grave site and memorial, Hornet Bank	Hornet Bank Station, Hornet Bank Road	Taroom	Banana
600824	War Memorial and Heroes Avenue	Wyndham Street	Roma	Maranoa

QHR No.	Place name	Address	Town	LGA
602155	State Butcher's Shop (former)	75 Arthur Street	Roma	Maranoa
601285	Roma Court House and Police Buildings	McDowall Street	Roma	Maranoa
601536	Roma Government Complex (Roma State School)	42 Bungil Street	Roma	Maranoa
600371	Mount Abundance Homestead	Warrego Highway, 5km west of Roma	Roma	Maranoa
601689	Hibernian Hall	38-44 Hawthorne Street	Roma	Maranoa
601767	Romavilla Winery	Northern Rd, Roma	Roma	Maranoa
601775	Hunter's Emporium	86 McDowell St	Roma	Maranoa
602378	Nostalgic Queen's Theatre	George Street	Wallumbilla	Maranoa

The *Nature Conservation Act 1992* (Qld), which includes management of cultural heritage values including NICH in the management principles of declared places under this Act.

Six (6) places were identified under the Nature Conservation Act are relevant to the GFD Project and listed in Table 4 below.

Table 4: Places identified on the Nature Conservation Act

Identified Place
Humbolt National Park
Lake Murphy Conservation Park Carraba Conservation Park Expedition National Park Palmgrove National Park
Blackdown Tableland National Park
Humbolt National Park
Lake Murphy Conservation Park Carraba Conservation Park Expedition National Park Palmgrove National Park
Blackdown Tableland National Park
Humbolt National Park

3.1.4 Local

Local heritage places are managed under Part 11 of the QH Act, local planning schemes and the *Sustainable Planning Act 2009*.

The QH Act provides a process for establishing a LHR and nominating places to the register. Specific criteria must be met in order to nominate a place to the LHR. These include:

- Enough information to identify the location and boundaries of the place.
- A statement about the cultural heritage significance of the place.

Following nomination to the LHR, the State Integrated Development Assessment System (IDAS) Code contained in the regulation to the QH Act and relevant local planning provisions will apply.

Places identified on the QHR are automatically included on LHRs (but have not been relisted in the table below – refer to Table 3). Those places which are 'Reported' on the Bendemere's Shire list (Schedule 9) and Bungil Shire's list (Schedule 10) and the Roma Town Council's list (Schedule 9) are not on any register and have been recorded as places of possible cultural heritage significance.

Twenty eight (28) places in addition to those which are identified on the QHR are located within the GFD Project area, are identified on the LHRs. These are identified in Table 5. Of those places identified on QHR, 10 places are located within towns and are unlikely to be impacted by the GFD Project. Of those additional places identified on LHRs, 21 places are located within towns and are unlikely to be impacted by the GFD Project.

Table 5: Places identified in planning schemes as being within the GFD Project area

Place	Address	Suburb	Former LGA	Current LGA
Taroom Cemetery	Lot 1 on C8276	Taroom	Taroom	Western Downs
Wandoan Cemetery	Lot 33 on FT617	Wandoan	Taroom	Western Downs
Donohue Family (Private) cemetery	Lot 1 on RP880173		Taroom	Western Downs
*Rocky Creek Bridge	Rocky creek	Jackson	Bendemere	Maranoa
*Yuleba Railway Complex	Yuleba	Yuleba	Bendemere	Maranoa
*Combidiban Creek Bridge	Yuleba	Yuleba	Bendemere	Maranoa
*Wallubmilla Railway Complex		Wallumbilla	Bendemere	Maranoa
*Wallumbilla Hospital	Raslie Rd	Wallumbilla	Bendemere	Maranoa
*Blythe Creek Bridge	Blue Hills Road	Bungil	Bungil/Roma	Maranoa
*Bungil Creek Bridge		Roma	Roma	Maranoa
*Roma Railway Complex		Roma	Roma	Maranoa
*1st Masonic Hall		Roma	Roma	Maranoa
*Roma Hospital	197 – 235 McDowall St	Roma	Roma	Maranoa
* Main Block	197 – 235 McDowall St	Roma	Roma	Maranoa
* Engineers Office	197 – 235 McDowall St	Roma	Roma	Maranoa
* Nurses Quarters	197 – 235 McDowall St	Roma	Roma	Maranoa
* Pathology Block		Roma	Roma	Maranoa
#St Paul's Anglican Church		Roma	Roma	Maranoa
#Ace Drapers	86 McDowall St	Roma	Roma	Maranoa
Commonwealth Hotel	75 Wyndham St	Roma	Roma	Maranoa
McCabe's Pharmacy	84 McDowall St	Roma	Roma	Maranoa
Old Town Council Building	61-71 McDowall St	Roma	Roma	Maranoa
Royal Hotel	99 McDowall St	Roma	Roma	Maranoa
School of Arts Hotel	104 McDowall St	Roma	Roma	Maranoa
Skill Centred Office	72 McDowall St	Roma	Roma	Maranoa
Western Star Office	120 McDowall St	Roma	Roma	Maranoa
Winnathoola	46-48 Northern Rd	Roma	Roma	Maranoa
Cobb & Co Corduroys	Yulebah-Surat Road	Surat	Warroo	Maranoa

* Place is 'Reported' only.

 # Places identified in planning scheme as State heritage values

3.2 Non-Statutory Searches

There are other sources of heritage places or historic places that are not listed on statutory registers. These places are not afforded legislative protection. Nonetheless, places identified by these searches contribute to a better understanding of the GFD Project area and may include places that have been overlooked or not yet accepted for entry on statutory heritage registers.

Further they provide an indication of the potential NICH values of currently unassessed areas within the GFD Project area. This is particularly important when considering the regulations of the QH Act with regard to archaeological places (refer to section 2.1.2).

3.2.1 (Former) Register of the National Estate

The (Former) Register of the National Estate (RNE) is a list of natural, Indigenous and non-Indigenous heritage places throughout Australia. Following amendments to the *Australian Heritage Commission Act 1975*, the Former RNE was frozen on 19 February 2007.
This meant that no new places could be added to or removed from the RNE. From February 2012, references to the former RNE were removed from the EPBC Act and the AHC Act. The former RNE is now maintained as a non-statutory register and publicly available archive. Detailed location information is often unavailable for these listings. Only those places shown as having NICH values have been included in Table 6.

Eight (8) places within the GFD Project area are listed as having NICH values. Six (6) of these places are identified in either the QHR and/or LHRs outlined above. The additional places are identified in Table 6.

Table 6: Additional places with NICH values listed on the former RNE

Place ID	Place	Location	Other Register
8824	Expedition Range Area Dawson Hwy	Approximately 140,000 ha extending along the Expedition Range from the Dawson River to 20 km southwest of Bauhinia Downs (additional location information provided in listing)	-
9281	Hornet Bank	Hornet Bank Rd, Taroom	-

3.2.2 Queensland National Trust

The Queensland Branch of the National Trust of Australia (QNT) maintains a register of cultural heritage places. The National Trust is a community based, non-government organisation which maintains a non-statutory register of heritage places. The listing of a place on the Queensland National Trust register, known as 'classification', has no legal force; however it is widely recognised as a statement of the cultural significance of a place.

Fourteen (14) places listed by the QNT are located within the GFD Project area. These places appear in either the QHR or LHRs previously outlined.

3.2.3 EPA listed places

A list of Indigenous and NICH reported places was compiled in 2006 by the then Queensland Environment Protection Agency (EPA) (now EHP), including locations (unverified). Some of these places were later revisited and listed on the QHR or under the *Aboriginal Cultural Heritage Act 2003* (Qld). The remainder have no statutory status or legal protection.

152 places <u>in addition</u> to those now listed on the QHR are located within the GFD Project area. These are listed in at Appendix A.

3.2.4 Historic Mines

The Queensland Department Natural Resources and Mines (DNRM) maintain the Interactive Resource Tenure Map (IRTM). The IRTM enables the user to search and display mining tenure and exploration information. In particular, it is possible to search and display historic mining leases. The information is generally limited to the last 100 years and therefore excludes mining activity in the nineteenth century. However, it provides some ability to determine the location of historic mining leases and potential mines that are located in the GFD Project area. Using this tool, no historic mines and/or prospects were identified in the GFD Project area although it is known that coal mining and oil extraction industries operated as various times within the GFD Project area (See Section 4.9).

3.3 Previous Reports

As this GFD Project covers a large, dispersed geographical area a number of previously prepared reports have relevance to this study as they were located either totally or partially within the current GFD Project area. It is noted that some reports comprised desk top assessments only. The following reports were considered by this assessment:

- Ann Wallin & Associates. (1996). *Assessment of the Historical Values Associated with the Proposed Nathan Dam Dawson River, Taroom*. Report prepared for Hyder Environmental.
- ARCHAEO Cultural Heritage Services. (2002). *Historical Assessment of the Proposed Rolleston Mining Project, Central Queensland*. Report to Hinz Consulting Pty Ltd.
- ARCHAEO Cultural Heritage Services. (2008). *Summary of Existing Environment Report for the Glebe Weir Raising Project*. Report prepared for MWH.
- Bonhomme Craib & Associates. (2008). Wandoan Coal Project; Non-Indigenous cultural heritage impact assessment. Report prepared for Parsons Brinckerhoff.
- Converge Heritage + Community. (2008). *Historical Heritage Management Plan, Nathan Dam*. Report prepared for MWH.
- Converge Heritage + Community. (2011). Non-Indigenous Cultural Heritage Assessment, Elimatta Project, Wandoan, Central Queensland. Unpublished report prepared for AARC for Taroom Coal Pty Ltd.
- Converge Heritage + Community. (2012a). *Non-Indigenous Cultural Heritage Assessment, Taroom Coal Project, Central Queensland*. Currently being report prepared for SKM for Cockatoo Coal Limited.
- Converge Heritage + Community. (2012b). *Non-Indigenous Cultural Heritage Assessment, Collingwood Coal Project, Central Queensland*. Currently being report prepared for SKM for Cockatoo Coal Limited.
- Converge Heritage + Community. (2012c). *Non-Indigenous Cultural Heritage Assessment, Woori Coal Project, Central Queensland*. Currently being prepared for Cockatoo Coal Limited.
- Heritage Consulting Australia Pty Ltd. (2011). *Arrow Energy Surat Gas Project, Non-Indigenous Heritage Report*. Report prepared for Arrow Energy.
- Maunsell Australia Pty Ltd. (2008). *Environmental Impact Statement, European Contextual History,* Surat Basin Rail Pty Ltd. Report prepared for Surat Basin Rail Pty Ltd.

These reports identify 68 places, 60 of which are previously unrecorded and eight of which have been previously identified on the various statutory and non-statutory registers. Those places assessed as having a minimum of local cultural heritage significance and/or requiring additional management which are located within, or in close proximity to, the GFD Project area are summarised in Appendix B. Place details can be referenced in the original reports. Those places which are collated in desktop assessments are identified using the source report.

An additional 90 places were identified during field work for the ARCHAEO and Converge projects. Some appear to also be identified in the EPA listed places tabulated in Appendix A. These were assessed as not providing a suitable level of cultural heritage significance in their own right to justify further assessment or management additional to the initial recording. These have not been included in the table above. However they do generally add to the character of the area and required initial assessment to either consider their cultural heritage values and significance. The majority of these places were dams, telegraph/telephone poles, survey trees, fencing, stock yards, some more recent dumps, some road structures, buildings and more recent commercial premises.

4 Historical Background

4.1 Introduction

The following historical discussion provides a brief overview of the history of the GFD Project area. It is based on library research of secondary sources and is intended to provide a contextual background for the identification and assessment of cultural heritage sites, places and features relevant to the GFD Project.

4.2 European Exploration

Ludwig Leichhardt is generally considered to be the first European to traverse the region, having set out from Jimbour (Queensland) in 1844 in order to determine an overland route to Port Essington. Leichhardt crossed the Dawson River south of Wandoan on 6 November 1844. The party tracked eastwards past Wandoan then on to Taroom. Leichhardt and one of his team, Gilbert, climbed a hill just north of the modern township of Taroom that provided a clear view of the surrounding district. Gilbert's description was the first recorded account of the Dawson Valley. He wrote: 'One of the most beautifully picturesque and extensive scenes met our anxious gaze… the high ranges rose up and formed a beautiful background to the most pleasing natural picture we have seen' (Fox 1959: 14).

By December 1844, Leichhardt and his party arrived in the vicinity of Rolleston. One of the party, Harry Brown, sited a significant waterway which Leichhardt subsequently named Harry's Lagoon (later known as Brown River). After they had visited the range to the north-west where, following the sighting of a comet, Comet Creek (later River) and Comet Range were named, the party spent Christmas Day at Brown's Lagoon. They are reputed to have camped under the branches of a Bloodwood tree, a spot which was to become Rolleston's main street (Pullar, 1999: 5). Further explorations from this camp located the junction of another river which was named the Mackenzie (Pullar 1999: 5-6).

Leichhardt then travelled through the Springsure district, naming the Expedition Range, Christmas Range and Albinia Downs.

Following on from his first successful expedition, Leichhardt determined to travel overland from the Darling Downs to the Swan in Western Australia. He passed through the Roma area in 1847 but his party encountered difficulties and returned to the Darling Downs. In 1848, he returned to the Maranoa, travelled to Mt Abundance and called at an outstation near present day Muckadilla. From there, Leichhardt wrote his last letters before setting off around 5 April never to be heard of again (Huff, McDonald and Myers 1993: 19-20).

Sir Thomas Mitchell's fourth expedition also passed through some of the GFD Project area. Mitchell was also in search of an overland route to Port Essington and the settlement of Victoria. He set off in December 1845 with a party of 29 men, bullock drays, carts, two iron boats and supplies for a year, including 250 sheep. He established a depot on the Maranoa and explored the headwaters of the Maranoa, Warrego and Belyando Rivers. He also discovered the Barcoo River which he called the Victoria (the name was later changed by Kennedy who explored the area in 1847) (Baker 1967).

4.3 Pastoral Expansion

Squatters and settlers followed shortly after the Leichhardt party and the southern part of this region became known as the Maranoa district (around present day Roma). It became one of the first districts in the future colony of Queensland (created in 1859) to be taken up for pastoralism. In June 1847, Thomas Archer, Arthur Chauvel and James Blyth explored Fitzroy Downs but failed to take up land. Later in 1847, Frederick Isaac, who had been with Leichhardt, successfully claimed Dulacca on the lower

Condamine. Charles Coxen led another group across the Maranoa from east to west but failed to find attractive runs, but he and his brother Henry did establish themselves in the eastern Maranoa after the Native Mounted Police 'pacified' the district (Collins 2002: 12-13).

In October 1847, armed with maps and advice supplied by Thomas Mitchell, Gwydir River squatter Allan McPherson set of from his property, Keera, with over twenty men, thousands of sheep and hundreds of cattle to occupy the land of the Mandandanji at Mt Abundance in the eastern Maranoa (Collins 2002:1). Centred on Mt Abundance near present day Roma, McPherson's run took in considerable stretches of the Muckadilla, Yalebone and Bungeworgorai creeks. McPherson sold Mt Abundance to Stephen Spencer in 1857. Spencer rebuilt the original head station building, which had been demolished, but decided to establish his own homestead upstream on Bungeworgorai Creek (Converge 2009:20).

Further north, land was taken up in what became known as the Leichhardt district. In 1847, Thomas Mark Windeyer, acting for his uncle, Charles Windeyer, took sheep to Wallibia Run on Woleebee Creek in the vicinity of the Jackson-Wandoan road. By 1849 three more stations had been taken up in the region. These were Juandah (16 000 acres), Cherwondah (19 200 acres) and Cooringa (16 000 acres) which covered the area now occupied by the town of Wandoan and the area extending from Wandoan to the south-east (Fox 1959, 23). The runs were amalgamated and became known as Juandah. By 1857 further stations such as Bundi further to the west had been taken up (Fox 1959, 24).

In the Taroom area leases such as Cockatoo, Carrabah, Bungaban, Lily Vale, Palm Tree Creek, Glenhaughton, Ruined Castle Creek, Reedy Creek and Eurombah were taken up. Early families included the Presho, Roche and Golden families (Fox 1959:17, 22). Mackenzie, Serecold, Walker and Wiggins took leases on Carnarvon, Clematis, Consuelo, Planet, Meteor and Orion Creeks (Cutler 1977:1). Lieutenant Serocold also took up a run in the Comet area and William Landsborough followed in 1858. He explored the Comet River to its watershed and was probably the first white person to explore the Rolleston/Springsure area.

They were followed by Peter MacDonald who took up land on the Nogoa and named the area known as Cullin-la-Ringo, Spanish for 'sought and found' (MacDonald 2001: 80). Squatting then spread to the central Leichhardt district (Injune, Rolleston, Springsure and Emerald), and east to the northern Burnett region (Banana and Biloela) including the Callide, Mount Sorcica, Bananah and Prarie stations. The main interest during the initial phase of pastoralism was wool production (Maunsell 2008:2).

By 1867 most of the land within the GFD Project area was taken up and by 1870 settlement had also begun at Rolleston (Johnston and Campbell 1979: 14). Land was initially stocked with sheep but as a result of overstocking, drought and variable land management regimes various weed species, such as burr, and undesirable grass species such as spear grass began to predominate resulting in a switch from sheep to cattle. The nature of rural workers also changed from shepherds to fencing contractors, stockmen, station hands and boundary riders (Fox 1959:52).

By 1886 the Great Artesian Basin had been discovered resulting in the sinking of bores in the western parts of the GFD Project area (http://www.visitinjune.com.au/history.php). In the eastern parts of the GFD Project area it appears that bores were developed later (post 1914) and that water conservation efforts revolved around the sinking of dam and tanks (Fox 1959:52).

4.4 Pastoralism and Frontier Conflict

With the expansion of European settlement came conflict with Aborigines for ownership and use of the land. The squatters appropriated valuable water holes, frightened away game and disturbed sacred sites. The only gain to Aborigines from the arrival of pastoralists and other settlers was that the stock provided good food to replace their traditional sources. However, squatters had arrived to use the land for the profit it could yield, and not to have their stock killed by people they considered 'uncivilized savages' (Reynolds 1987: 42). A state of constant conflict, frequently breaking into violence, raids and vigilante-style punitive reprisals soon developed between European and Aboriginal communities throughout Central Queensland.

Hostility eventually grew so intense that the white squatters asked the colonial government for police protection. The government sent a detachment of Native Mounted Police (NMP) to set up depots at various locations. While its numbers never rose above 250, the NMP force's numerical disadvantage against larger groups of Indigenous people was overcome by its use of horses and superior weaponry, particularly the Snider carbine (Thorpe 1996: 49). Officially, it was their job to maintain law and order; to protect both black and white. However, what this meant in practice was that Aborigines were summarily punished, often by 'dispersals' accompanied by indiscriminate firing into campsites and travelling groups, for trouble real or perceived (Reynolds 1987:18; Rowley 1970: 157-168).

The conflict between local Aboriginal groups, the NMP and white settlers reached its peak in 1857 when 11 Europeans, including most of the Fraser family and their employees, were killed by Aborigines at Hornet Bank on the Upper Dawson, west of Taroom and within the GFD Project area (Reynolds, 1987: 47). Severe retaliation by white 'vigilante' parties followed this attack.

To the south in the Maranoa pastoralists and the police fought with the Mandandanji for control. Commandant Frederick Walker's NMP patrols were 'relentless' and in the Attorney-General's opinion 'a great many blacks are suspected of having been killed by the police' (Collins 2002:145).

In 1861, the largest massacre of Europeans by Aborigines in Queensland occurred at the Cullin-la-Ringo station, north of Springsure on the Nogoa River. The attack was probably the culmination of the conflict and reprisal attacks carried out in the region in the previous decade (Reid 1982: 137-8). More reprisal attacks followed the massacre at Cullin-la-Ringo.

In time the local Aboriginal people were dispersed and pacified by the NMP. It became common practice to use local Aboriginal men as labour on stations and women as domestic servants (French 1989:109).

4.5 Towns

4.5.1 Rolleston

Rolleston was established at a point on the Brown River where one of the few clearings in the Brigalow scrub in proximity to water was located. This was an ideal place for teamsters travelling to and from Rockhampton to stop so in 1862 John Tregillgus (migrant from Cornwall) built the Planet Inn. The hotel, a valued resting place for weary travellers, was built on three feet high logs and consisted of pit sawn boards (Pullar, 1999: 13). Even so, Rolleston did not exist as a formal township. The following year an attempt to incorporate the crossing where the Planet Inn was sited within the 'Planet Downs' pastoral holding stimulated the first stirrings of local civic activity. Local residents petitioned Governor Bowen, stating they had been:

Living for some time at the crossing place on the Brown River on the main western road from Rockhampton…there are now two stores, one public house, one blacksmith's shop and several working men, carriers and such like at present located there (Pullar, 1999: 13).

Surveyor-General, Augustus Gregory submitted his plans for a new township to the Governor on 25 May 1865 following further urgings by the new owners of the Planet Inn. The town was initially called Brown Town but became known as Rolleston, after the pastoralist and former Land Commissioner, Christopher Rolleston (Johnston, 1979:4). The plans met with the Governor's approval resulting in the one square mile along the river below the lower end of the Warrijo Waterhole being declared as the Town Reserve of Rolleston. By 1871, Rolleston had a population of 30, several residences, an unofficial post office and a provisional school with nine students enrolled.

Neighbouring stations also supported small populations. At the end of the nineteenth century Consuelo was the largest station with 69 people, Orion Downs had 57 people and Meteor Downs had 54 people. Warrinilla Station, comprising approximately 300 acres, had four houses – the main house and one each for the three sons – each with its own vegetable garden, a lagoon and a tennis court. One result of station isolation was that each station required its own cemetery (Pullar, 1999:30).

By the 1880s, the township of Rolleston rivalled Springsure as a major town on the Rockhampton road, but once the Springsure-Rockhampton link opened in 1886, Rolleston suffered as Springsure grew in importance (Rolleston Coal Mine 15). In 1887, Rolleston was described by a teacher from the local school as 'a miserable little hole' which was 'too much inland' and subsequently 'not easily commutable without great cost and trouble' (Rolleston Coal Mine: 15).

Nevertheless Rolleston survived and has recently found new prosperity with the expansion of the coal industry.

4.5.2 Taroom

Taroom began as a junction of bush tracks that were in use by the time the Leichhardt Pastoral District was proclaimed in 1854. One road roughly followed Leichhardt's path over the Great Divide to Juandah Creek, while another passed through Cockatoo Creek and over the Auburn Range to Burnett's Inn (Gayndah) a route now approximately followed by the Cracow Road. Wool was carted along another track from Roma via Taroom to Banana Station, Rannes and from there to Rockhampton. A mail route, meanwhile, was opened between Condamine and Taroom in 1853. The township also served as a transport junction and as a staging post between Roma and Rockhampton (Converge 2012a:44).

The township therefore came into being as 'a direct and natural response to the need of the local dispersed farming [i.e. pastoral] population for a small servicing centre – with simple commercial, transport and communication functions' (Dick 1960: 9). It had a post office by 1856 (one of the earliest settlements in Queensland to do so after Brisbane, Ipswich, Roma and Condamine) and by 1858 had been declared as a place for Petty Sessions as part of a large police district embracing Leichhardt and Port Curtis. A rudimentary courthouse, lockup and adjacent hut for the constable were erected, and local pastoralists such as W.H. Yaldwyn, J. Scott, H.C Gregory, E.M. Royds, C. Royds and G.P. Serecold served as magistrates (Fox 1959: 35).

The town was surveyed by Clarendon Stuart in 1860, and sale of the first town allotments held on 25 June the following year. The population of Taroom at this time was 44 males and 19 females. Only four 'suburban' allotments were sold at that time, but the local mood remained positive.

By 1864 the population had grown to some 188 men and 68 women. A number of Chinese men had also been employed as shepherds and remained in the district engaged in other occupations.

The telegraph line was in operation at the end of 1865, after which Taroom served as the major 'repeating office' for the region as the telegraph services spread further north. Thereafter the township consolidated as the hub of a generally busy and prosperous pastoral district (Converge 2012a: 44).

When the planned branch of the Central railway to Taroom (see Section 3.7.2) did not extend beyond Wandoan, Taroom could not prosper in the same way as did Wandoan and had to rely on road transport. It did however continue as a local centre for the pastoral district until by the late 1950s it supported a population of over 600 people (Queensland Places: Taroom). Coal mining in the Taroom district from the 1970s onward has also helped ensure the vitality of the township.

4.5.3 Wandoan

The push towards closer settlement in the Dawson River district at the end of the nineteenth century resulted, in 1902, to the survey and planning of a town settlement in the vicinity of the existing pastoral centre at Juandah. The first settlers began arriving soon after, though the first sale of town land did not occur until mid-1913 (Fox 1959: 124). Thirty-five town allotments were purchased on June 7 that year (Woodside 1997: 53).

A branch railway line from Miles to Wandoan (see section 3.7.2) was planned in the early 1900s and reached Wandoan (then still known at Juandah) in 1914. It proved a great stimulus to development in the town, with shops, hotels, post office, police station and Lands Office appearing in its wake. The official name change from Juandah to Wandoan occurred in 1927, primarily to recognise the township's distinct identity apart from the old pastoral station on which land it was situated.

The diminished fortunes of Taroom in the second half of the twentieth century can be contrasted with those of Wandoan. A quickening pace of settlement and agricultural development was experienced around Wandoan compared to Taroom in the aftermath of the World War II partly as a result of a soldier settler scheme. By the early 1960s, in fact, Wandoan's increasing connection to the south was to the detriment of its traditional relationship with the administrative centre at Taroom. This trend accompanied closer rural settlement, the improvement of roads to the south, and the greater growth of services in Miles and Wandoan compared with Taroom. Additionally, the growth of dairying in the Wandoan area increasingly worked to the advantage of Miles which had the sole butter factory (Dick 1960: 23). The rail connection between Wandoan and Miles would also have helped in this regard.

As with Rolleston and Taroom, Wandoan has benefited from increasing interest in coal mining ventures.

4.5.4 Roma

The Town Reserve of Roma was proclaimed in September 1862 (Donnelly 2005: 32). By the end of 1862, Archibald MacDowall was engaged in surveying the Bungil Creek and laying out a township at its head (Donnelly 2005: 33). The new township was named 'Roma' at the end of that same year in honour of the wife of Sir George Ferguson Bowen, the first governor of Queensland (Donnelly 2005: 33). By the early 1860s, Roma was a collection of bark huts, with a population of 82 recorded in 1865, residing on a creek crossing, half-a-days travel east of Mt. Abundance (Donnelly 2005: 13).

Beginning as a settlement of squatters, the dominant industry was based on sheep and cattle. Roma became a municipality in 1867; five years after the first survey pegs had been placed. The first municipal elections were held in August 1867 and Alderman T. McEwan was elected as the first mayor. In 1866, the first Roma court house was built, slightly to the west of the present site. It was initially hoped that the court house would form the centre of the town; however that role was soon taken over by the Post Office, which greatly influenced the development of the town centre (Town of Roma 1967). The Roma branch of the Bank of New South Wales was opened in 1867 (Town of Roma 1967) and permanent Council Chambers were built in 1871 (Roma Tourism Association 1998:19).

Figure 4: Mount Abundance Station in the Roma district ca. 1880 (APO-026-0001-0032)

In 1872, the present golf links site was declared a public reserve and the show ground site was selected. The township grew from small pastoral beginnings into a significant rural service town when it was connected to Toowoomba via Dalby after the extension of the Western Railway line in 1880.

The built environment of present-day Roma commenced in the 1880s as the result of the closer settlement which was encouraged by the coming of the railway. In mid-1881, a number of cottages were built in various parts of the town, mainly around the Court House, in the vicinity of the Euthulla Road, and in Arthur Street towards the railway line (Taylor 1964).

Additionally in 1882, Green and Bellgrove's new sawmill was constructed and directly opposite the end of Station Street, Cottell and Co's new blacksmith shop was built (Taylor 1964). The Queensland Hotel at the south west corner of the Bowen and Wyndham Streets intersection was also constructed in 1881.

Figure 5: Distant view of Roma, 1899 (JOL Image number: 191024)

4.5.5 Injune

The town of Injune was established both in response to the 1919 soldier settlement scheme that was established in the Injune-Gunnewin-Bymount area and the anticipated rail extension from Orallo (see Section 4.8.2). The railway station was opened on 30 June 1920, the line completed at the beginning of August, and the post and telegraph office opened ten days later but the town itself, built around Injune Creek, was not gazetted until 1922 (www.Injune.net.au).

During the following three years further community infrastructure was built including the police station, school of arts hall, trucking yards and church. The continuing growth of the town was given a boost by the opening of the Maranoa Colliery in 1933 and it became the main town for the then Bungil Shire. By mid-1955 the town boasted a bank, schools, airstrip, bush nursing facility, hotels, public phone, various clubs, a picture theatre and town electricity.

Town water was connected a year later in 1956 (www. Injune.net.au). Injune remains a small rural centre of approximately 400 people servicing the broader region.

4.6 Provisional Schools

Provisional schools were established where an average attendance of between 12 and 30 pupils could be maintained and where the local communities could provide a suitable building at their own expense. The provisional school teacher appointed was usually an unclassified teacher who was not provided with a residence by the Queensland Government and who received a salary that remained less than that of the lowest classified teacher (Department of Education and Training, Education History, accessed 6/3/ 2012). In the days before good road networks, this form of school was more common and in some instances schools were situated in relatively isolated small communities away from the main centres. Examples in the GFD Project area include the Grosmont, Guluguba, Komine and Yuleba Creek provisional schools.

Some, such as the Guluguba and Grosmont schools have survived into the present. The survival of the school was ultimately decided by the fortunes of the surrounding pastoral district and consequent labour requirements but also the closure of nearby schools. In this way the closure of smaller schools at Downfall Creek (1962) and Gurulmundi (1965) lifted enrolments at Guluguba school which became a State School in 1920 (Bahnisch and Stiller, 1992:4, 14-16).

4.7 Closer settlement and Land Schemes

In an attempt to break up the large pastoral runs of the early squatters and open up land for closer settlement the Queensland parliament passed a series of Bills between 1860 and 1894. The goal was to create a more viable and diverse economic base for the development of the colony (QDEH, *Scoping Study*: pp37-8 quoted in Bonhomme Craib & Associates, 2008:10). One such law was the 1861 Survey Law. This law allowed anyone who could afford £1 per acre to select up to 320 acres of Crown land wherever they liked. Squatters responded to this by registering 'dummy runs' in the names of accomplices (Bull 1960: 5). A further blow to some squatters came with the *Lands Act 1868* (Qld), under which the government took half the acreage of stations in the settled districts, and cut the resumed portions into farming blocks. An example of this pattern is the Cosuelo lease near Rolleston which was one of the first in this region of the large land holdings to be partly resumed and leased as smaller stations, thus gradually increasing the dependence of stations on towns such as Rolleston for their supplies (Pullar, 1999: 490).

The *Crown Lands Act 1884* (Qld) further reduced the size of holdings. It required pastoral run leases be surrendered and the properties divided in two, with one part being resumed by the Crown and the other being offered back to the lessee for a further 10 to 15 years. This pattern continued and gradually the nature land holdings in Central Queensland changed until it was no longer characterised by a few enormous holdings. Thus the latter part of the nineteenth century was characterised by closer settlement and greater agricultural activity in suitable parts of the GFD Project area. Emerald, Springsure, Injune and Roma had also benefited from the advent of the railways and closer settlement that was encouraged by transport developments.

The further development of the beef cattle industry was prompted by the development of refrigeration technology. In 1880, the first shipment of refrigerated beef was sent to London and by 1896, 100 refrigerated ships were plying the trade (Howarth and Kelly 1979: 2). Drought, particularly the Federation Drought (c. late 1890s to 1902), and the scourge of cattle tick affected cattle production for almost two decades. The industry slowly recovered in the late 1910s (Johansen 2004: 18).

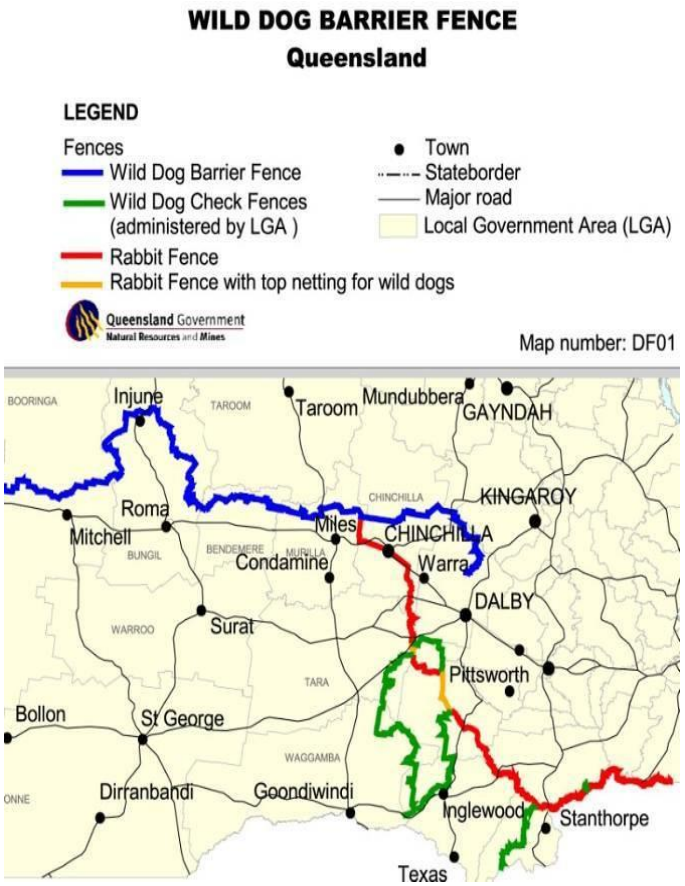

Figure 6: Figure showing Wild Dog and Rabbit Fences (Qld Department of Natural Resources and Mines 2005)

Cattle numbers continued to increase during the 1920s and by the middle of that decade Central Queensland had more beef cattle than any other part of northern Australia (Johansen 2004: 19). The cattle industry thus became a key economic driver of the region, which also stimulated town development.

Government initiatives such as the Bungeworgorai State Farm near Roma helped develop the wheat breeding industries, crop and new species development, disease management and dry farming techniques of the region from 1900 particularly under the management of W and R. Soutter (*The West Australian* 18/7/1932:17, Western Star and Roma Advertiser 7/6/1933: 3). Other cereals and various fruits such as citrus, apricots, Japanese plums and grapes were also trialled through the years (*The Queenslander* 18/11/1911:37).

By World War II, the farm was employing members of the Australian Women's Land Army and cultivating small crops and raising pigs, cows and sheep (Sunday Mail 25/4/1943:9).

The Queensland Government also introduced a number of land schemes and/or government initiatives within the GFD Project area over the years which had significant effects on the overall development of land and the form it took. Some included the introduction of the 'Wild Dog Fence', part of which cuts through the southern parts of the GFD Project area (see Figure 6), whilst others dealt with closer settlement and land management. Major schemes are identified in the sections below.

4.7.1 Co-operatives

Prompted by the severe economic depression experienced in Queensland in the 1890s, there were calls for the establishment of co-operative communities along the lines of the example set by William Lane's 'new Australia' experiment in Paraguay in 1893.

One such co-operative, established through funding provided by the *Co-operative Land Settlement Act 1863* (Qld) was located in Rolleston. Here a declining population led the government to initiate the Reliance Group co-operative. It was established in Rolleston and comprised of 41 men and 129 women and children who as a group took up 4,100 acres of land on the east boundary of the Rolleston Town Reserve at the intersection of the Taroom Road (Rolleston Coal Mine 15).

The experiment was a spectacular failure; lack of knowledge of crop propagation, drought and general laziness proving insurmountable obstacles (ARCHAEO 2002:20). In 1895, the Reliance Group was disbanded and the land sold to selectors. Just one family, the Fitzgeralds, stayed in the area. The land is now owned by Frank Thomas.

4.7.2 Prickly Pear

Prickly Pear[1] was identified as an agricultural menace in the last decades of the nineteenth century. Originally introduced by homesick European settlers, prickly pear spread rapidly in the Australian environment. It out-competed native grasses and other vegetation, especially in degraded pastoral areas. By 1850 it was established in Chinchilla and by 1863 in Taroom (Freeman, 1992:415).

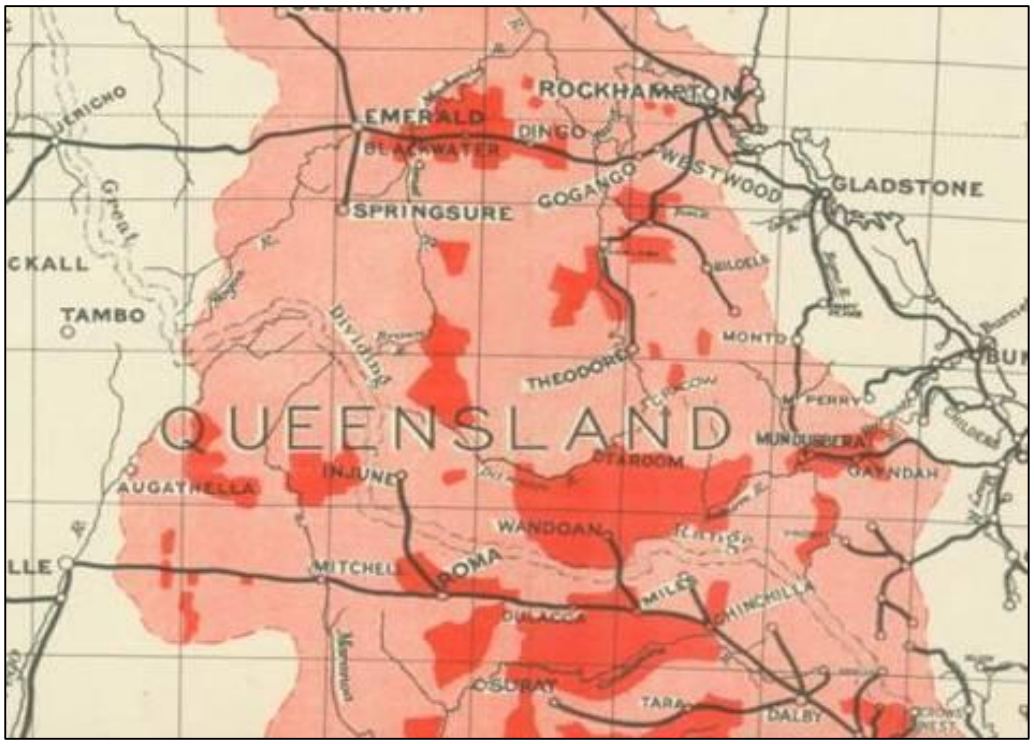

Figure 7: Extent of Prickly Pear in 1925 – light pink = scattered pear, red = dense pear. (Source Commonwealth Prickly Pear Board 1925: map)

[1] Prickly Pear is the common name for several species of the genus *Opuntia* (family Cactaceae) that are indigenous to the Western Hemisphere (Freeman, 1992: 414).

In the first decades of the twentieth century, regarded as the peak of the prickly pear infestation, it is estimated that approximately 250,000 square kilometres was virtually rendered useless by thick prickly pear infestations (Freeman, 1992:416). The degree of infestation encompassed an area larger than Great Britain. The degree of infestation across the GFD Project area can be seen in Figure 7.

Until effective biological controls were identified and implemented, the chief means through which the colonial and later state governments sought to control prickly pear was through land reform and closer settlement. Specifically the government sought to encourage settlers to clear prickly pear by imposing targets for clearing pear as part of the conditions of small grazing and farming leases. A series of Acts and amendments, passed between 1895 and 1908, created a new class of prickly pear leases under which land was made available to settlers at cheap or no rent.

Lease conditions required the clearing of defined amounts of pear from the blocks over the duration of the lease (Freeman, 1992:419-422). A complicated set of arrangements existed for these prickly pear leases, depending on the degree of prickly pear infestation, as assessed by local land commissioners. Prickly pear selections were typically around 2,500 acres and selectors could only acquire a maximum of 5,000 acres.

Initial efforts at investigation and control proved fruitless. Indeed, the decades up to the mid-1930s saw declining population numbers in centres such as Taroom and Wandoan, largely because of the infestation of the partially cleared brigalow scrubs by the prickly pear cactus as well as wider economic challenges (Dick 1960: 11). A specific example of the effect of this infestation and subsequent land development within the GFD Project area is in the Wandoan area. Here, in 1905, a local Land Commissioner reported that large areas of the Juandah Lease were overrun with prickly pear. In 1908 surveys were completed to subdivide for closer settlement areas of the lease resumed in 1885 and 1908. The proposed blocks were overwhelmingly designed as Prickly Pear Selections (QSA ID 26798). It seems these plans were shelved when W.J.H. Moore surrendered the remaining 210 square miles of the Juandah Lease in 1909. The land was resurveyed and included in a larger release of settler blocks in 1910, most of which were also Prickly Pear leases.

While the degree of infestation varied across the former Juandah leasehold areas, the situation faced by those who took up prickly pear selections around this time is illustrated by the recollections of the late Sydney Stiller (below), whose family took up Prickly Pear land around Downfall Creek, just to the east of the GFD Project area:

> *'Dad's block was mostly a dense mass of prickly pear ... after the survey Dad and his two brothers walked around the block in the pear trench cut by the surveyors and came back home full of pear prickles. Dad never saw the back boundary again until over twenty years later when we had it fenced' (Bahnisch and Stiller, 1992: p78).*

In 1916, the Queensland Under Secretary for Lands admitted that the Juandah selections had not been entirely successful. Settlers could not be found to take up pear infested blocks even when the purchase price was nil and the settlers had ten years in which to clear the pear (*The Queenslander*, 19 November 1916).

Relief came in spectacular fashion when the larvae of the cactoblastis moth were released around 1926. In many farming districts the clearing of the prickly pear was considered nearly miraculous. Pear was replaced by a dense mat of fibre which was subsequently destroyed, in addition to timber growth, by the fires which then swept through thereby '…opening up large areas to pasture'(Dept. of Lands 1968:4). By 1935 'the prickly pear in most areas of the State was under control, and lands that had been ravaged and rendered useless by the pear [were] rejuvenated' (Woodside 1997: 73-4).

After the release of the cactoblastis caterpillar a further series of Acts and Amendments to develop further classes of small farming leases, based on the capacity of the land, post prickly pear were passed by government. These leases, many issued over existing prickly pear schemes, were capable of being converted to fee simple upon the elimination of prickly pear and the payment of the original price (*Queensland Government Gazette* No 124, Monday, 15th December, 1930 printed in Woodside 1997:71-75). These promoted the development of dairying and mixed farming that remained the mainstay of parts of the GFD Project area through the depression (Bahnisch and Stiller, 1992:78).

4.7.3 Soldier Settler Schemes

State governments initiated soldier settlement schemes after both World Wars in many parts of Australia, including within the GFD Project area. The Queensland legislation entitled every discharged member of the armed forces to apply for land and financial assistance in order to place 'willing and suitable settlers on the land' and to open up new land and to provide employment and assistance to returned servicemen and their dependents (QSA Guide 35).

In 1919 a soldier land settlement scheme was established in the Injune-Gunnewin-Bymount area. The land allotted for the scheme was adjacent to the proposed railway line, which would connect Roma to Injune (www.injune.net.au/history).

Two schemes were also initiated in the Wandoan area post World War II. These were the War service Land Settlement Scheme (1952) and the Group Settlement Scheme (1954) (Wandoan Museum display). Some 32 resumptions from local leasehold properties were made, and by 1952, 31 blocks of the proposed 120 farms were occupied by ex-servicemen and their families, averaging around 1200-1300 acres each. These were spread across the local parishes of Wandoan, Jerrard, Juandah, Langhorne and Juliet around Bungabah Creek, and a large number (16 selections) in Rochedale Parish ('Wandoan Closer Settlement' 1961: 4). The later Wandoan Group Settlement Scheme ballots of March, June and December 1954 introduced another wave of settlers to the district. After 1954 the links with the broader 'War Service Land Settlement Scheme' were reduced, although the Queensland government continued to favour veterans as the emphasis shifted to a 'Group Lands' scheme ('Wandoan Closer Settlement', Wandoan District P & C 1961).

The settlement schemes thus introduced around 70 new selectors into the district after the three ballots held in 1954. Approximately 107,000 acres around Wandoan were allotted to these new arrivals that year. Many of these soldier settler blocks were not large enough to be sustainable. The resumptions also had their effect on the previous land holders:

> *This was of course an absolute disaster, and within a few years each settler was allowed to buy out his neighbour, but of course by this time a lot of damage had been done to the country. This was caused by the heavy overstocking that was needed to try to make a living, and the erosion that inevitably followed in this area of very heavy summer storms. The worst part of the whole business was the number of original owners who became bankrupt….' (Pike 2001:40)*

Nevertheless, the 'soldier settlers' and selectors under the group settlement schemes who arrived in the early 1950s, generated a local population boom. The settlement schemes had introduced around 70 new selectors into the district after the three ballots held in 1954.

In the early years of soldier settlement, most of the selections around Wandoan were turned over to dairying, although some blocks pastured sheep.

Milk and cream was sent to the local butter factory at Miles. Pig raising was pursued as a complement on many farms in the Wandoan district, and the railways provided the means of transport to the Darling Downs Bacon Association in Toowoomba. Elsewhere, dairying, pig-raising, grain growing and sheep were attempted, but over time most concentrated on cattle and grain. The success of wheat cultivation in the region, from the 1950s, resulted in the construction of the first silos at the Wandoan grain depot (Bonhomme Craib2008:16) Brigalow Scheme

4.7.4 Brigalow Scheme

Prior to World War II and the introduction of recycled surplus war machinery such as tractors and Matilda Tanks, clearing of brigalow was undertaken by hand either by felling or ringbarking followed by burning. Apart from being slow and labour intensive, the ability of brigalow to produce root suckers following clearing meant that these methods were often unsuccessful and/or exacerbated the brigalow 'problem' (Dept of Lands 1968: 6). Post War increased prices for wool and beef and the need for land for selection by returned servicemen and access to mechanisation saw the development of 'pulling' the brigalow which was '…performed by two heavy tractors linked together by a heavy (about 2' [inches]) steel cable and/or chain acting in unison and advancing through the scrub at varying distances…but generally about $1^{1/2}$ chains apart' (Dept of Lands 1968: 7). This was followed by burning and aerial grass seeding. In some areas aerial weedicide spraying of suckers with products such as 245T or 24D was also undertaken.

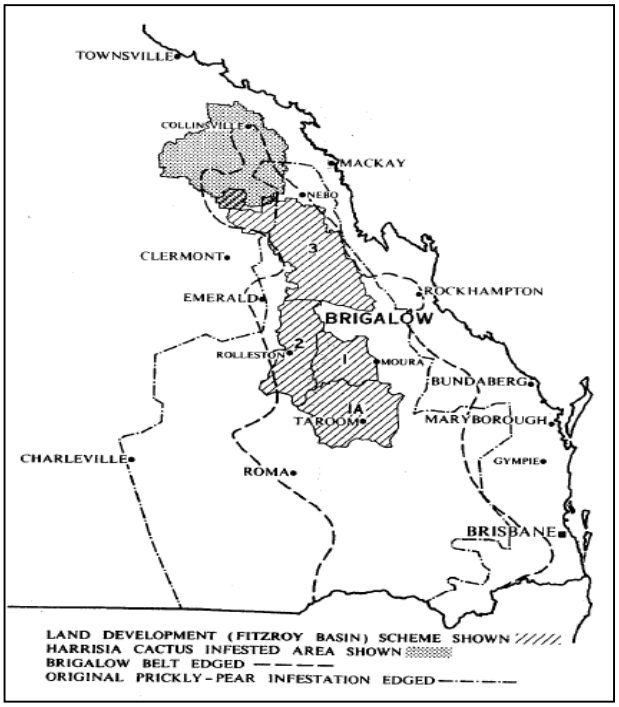

Figure 8: Land Development Fitzroy Basin Schemes (Dept of Lands 1968: np)

Despite the increased pace of clearing, relatively untouched areas of brigalow remained in Central Queensland into the 1950s. In order to increase productivity in this region (which includes the GFD Project area), the government initiated the Land Development Fitzroy Basin Scheme (the 'Brigalow Scheme') which was implemented in three main phases as illustrated in Figure 8.

This scheme introduced the Brigalow block, of no more than 10,000 acres, which represented a further subdivision of existing leases.

Some of the new blocks were released to the existing leaseholder, some were sold and the remainder were allotted by ballot. Financial assistance at favourable rates, partial stocking with cattle were also offered for those lots allocated by ballot. Land lying within the scheme was to be cleared, sewn with pastures, fenced, and provided with cattle tick control units and water facilities. A key part of the scheme was the commitment by government to provide adequate roads within the defined scheme area (Dept of Lands 1968: 10, 11).

Changes to the landscape were profound. In the Rolleston area prior to the scheme there were:

> *Scores of thousands of acres of brigalow, wilga and prickly pear scrub, absolutely useless and full of wild unbranded cattle. Cattle were born and died of old age in those scrubs, without ever having a brand on them (Priddle, 1972: 48).*

After the implementation of the scheme, the government offered 30-40 'Brigalow Blocks' for ballot in the Rolleston area. The country was transformed from a few large cattle stations to numerous, smaller highly productive cattle farms.

The effects on towns like Rolleston were equally dramatic; the community hall was built, sporting facilities introduced, the CWA came alive and churches filled (Pullar, 1999: 63).

4.8 Transport and Communications

4.8.1 Stock routes

The early settlement of the region established a number of rudimentary tracks by which the initial large leases were accessed. Some of these early tracks used the alignment of Aboriginal tracks. An example of one of these early 'roads' was the track in use by 1855, which connected Roma to Rockhampton via Taroom Banana Station and Rannes (Ann Wallin & Associates 1996: n.p.).

In part, this track alignment passes through the GFD Project area. Stock routes often paralleled these early access tracks. With the advent of the transport of animals by rail and then truck some of these stock routes became redundant. However many remained open. In the GFD Project area this includes most of those identified in Figure 9 and 10.

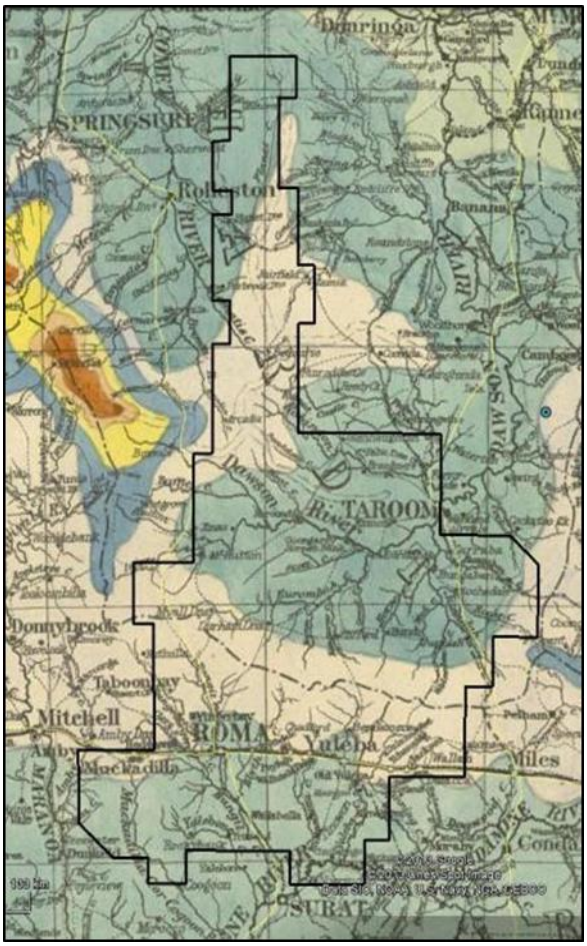

Figure 9: Project area overlaid on 1911 map of roads (QSA ID 629759, project area URS)

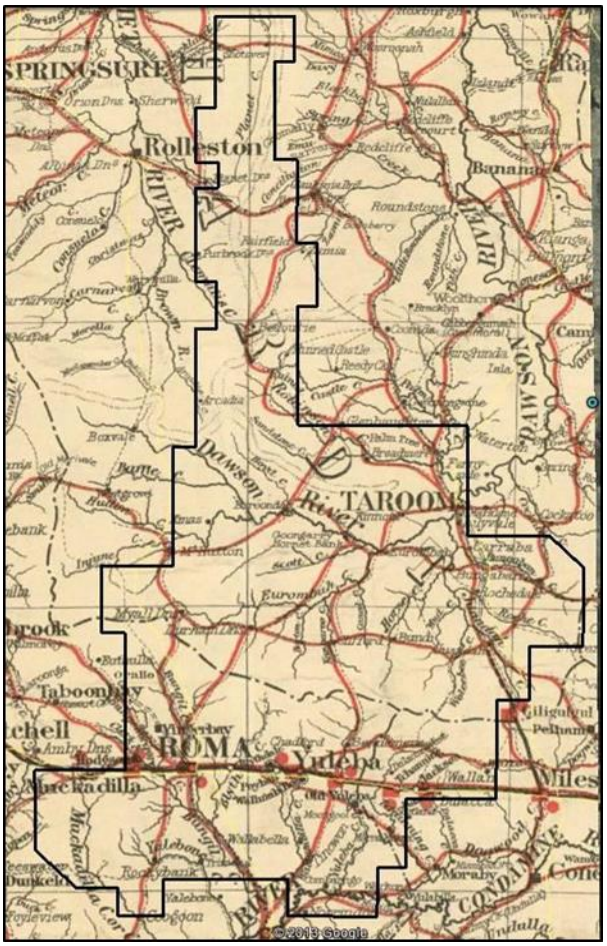

Figure 10: Project area overlaid on 1914 map of stock routes (JOL ID 629865, project area URS)

4.8.2 Roads

Settlements and pastoral stations were tenuously linked by these 'roads' and stock routes and coach services moved people and mail between them and, with time, the telegraph lines that connected service centres. The most well-known of the coach services was Cobb & Co. A Cobb & Co coach service ran between Dalby and Condamine, which is located to the south of the GFD Project area, from 1867.

Cobb & Co then extended the service to Roma. The colonial government undertook construction of the Western Railway from Dalby to Roma in 1876. It was completed in 1879. Cobb & Co was 'forced to retreat ahead of the train' (Tranter 1990: 33). The Dalby to Roma service via Condamine ceased in 1877. A new service was established between Warra (slightly to the southeast of Chinchilla) and Roma in 1878.

Coaches remained important throughout the nineteenth century and even the early twentieth century wherever trains were absent (and before the advent of the motor car). For example, four- horse coaches provided the main connection between Taroom and Miles via Juandah in the early decades of the twentieth century (Tranter, 1990: 114). The route was first serviced by Williams and Morgan of Taroom who ran a coach service. There was a horse change station about every 10 miles including one reportedly just north of Guluguba, near Wallace Brae (Bonhomme Craib & Associates 2008:16, 19).

By 1911 it is evident that a road paralleled the Western Railway linking Dalby with Roma and Charleville (see Figure 8) and comprised a major trunk road. This road eventually became known as the Warrego Highway. The Dawson Highway was originally a series of roads (some of which were in very poor condition) that connected the various settlements in the region and were generally in a poor condition. Prior to the mass ownership of motorised vehicles, rail transport was considered much more important than road transport and received more attention by colonial and state authorities. Road networks, where they existed, and the grading of new roads were the responsibility of local authorities. During this early period roads were seen as complementing the existing rail system. Main roads between towns were only constructed if there was no existing railway (Diamond n.d.: 27)

In the first few decades of the twentieth century, car ownership increased dramatically in Australia as motor vehicle technology was refined and became more affordable. Consequently, the State Government began to take a greater interest in the planning and management of major road networks throughout the State. The Queensland Main Roads Department was created as a result in 1920 (Main Roads Department, n.d.: 14-15).

The roads and some bridges were steadily improved from the 1920s onward after the formation of the Department of Main Roads (Pullar 1999: 44). However continuing conflicts between the Department of Railways and Main Roads slowed the process of the construction of many roads where rail was in direct competition with vehicles.

During the years of the Great Depression in the 1930s, despite the drop in revenue provided to the Main Roads Commission, a number of road building relief schemes were initiated including the clearing of brigalow after the end of the prickly pear infestation on sections of what became known as the Warrego Highway in the vicinity of Chinchilla (Diamond n.d.: 47).

The road from Rolleston to Roma was also declared a State Highway in 1930 and work on upgrading the road first occurred in the 1930s (Johnston & Campbell 1979: 74-5). It is now known as the Carnarvon Highway.

During the early 1960s, an added incentive in the GFD Project area was the implementation of the Brigalow Scheme which included the provision of adequate roads within the defined land development areas as part of its general plan of development (Dept of Lands 1968: 11). This saw the eventual construction of 1,348 km of access roads and additional service roads between properties. The Dawson Highway was upgraded as were the two main trunk roads which connected Rolleston with Injune and Rolleston to Moura over the Expedition Range (Nissen 2008: 103). It is possible the highway was named the 'Dawson' officially in this period (prior to this decade it appears that different sections of the highway were known by different names). Work continued improving difficult sections of the highway through to the early 1980s (Shire of Bauhinia 1981: 13).

4.8.3 Railways

Railways were extended into Central and Western Queensland after 1865 (Queensland Railways 1865-1965) after settlers had petitioned strongly for their construction. Although the idea of a railway that extended west from Rockhampton into the Leichhardt district was considered to be absurd (due to the fact that settlement was very sparse and the area only newly discovered), the idea was assented to by the colonial Parliament (Meston 1890: 111).

Much of the GFD Project area underwent significant transformations with the advent of the rail, as the rail traffic inevitably encouraged closer settlement, economic development and the opportunity to explore mining ventures that hitherto had been confined to the south east corner of Queensland (Queensland Railways 1865-1965)

Figure 11: Dawson Valley, Bone Creek Bridge on Central Railway ca. 1878 (JOL Image number: 46987)

Small settlements and fettlers camps were established ahead of the line in order to accommodate construction gangs (fettlers). Some of these small camps in turn developed into railway stations. Some became big enough centres to warrant the establishment of post offices and schools. In this way settlements such as Wallumbilla, Yuleba, Blythesdale, Jackson and Guluguba were established in the southern parts of the GFD Project area and Minka, Yingerbay and Oogara on the western side of the GFD Project area.

Construction of the Great Northern Railway (renamed the Central Railway in 1878) began in 1867. The first track of the Central Railway, 24km in length, was laid between Rockhampton and Westwood in 1867 (Queensland Railways 1865-1965). Westwood was chosen because it was the point where the roads to Taroom, Springsure, Peak Downs and the central west diverged (Meston 1890: 111). Construction of the line continued throughout the late 1860s and 1870s eventually connecting Westwood to Comet in 1878 and Comet to Emerald in 1879 (Queensland Railways 1865-1965). Branch lines extended from Westwood to Springsure (1886) and from Emerald to Ullathorne, Gindie, Kammel, Fernlees, Wurba, Minerya, and Dilly, and north to Clermont (1884) (Meston 1890: 112).

By 1900, the Central Railway stretched from Rockhampton to Longreach, and extended in every direction by branches, which linked the areas of Gladstone, Mount Morgan, Clermont and Springsure to the line. It totalled 951 km in track and represented a significant part of the capital invested in the railways in the period after 1865 (Kerr 1990: 94). An example of the form of bridge construction on this railway is at Figure 10.

The first railway to be constructed in Queensland was between Ipswich and Bigge's Camp (later named Grandchester) in the early 1860s. The line was quickly extended to Toowoomba and then to Dalby by 1868. In 1875, the Western Railway Act 1875 was passed allowing for the extension of the line from Dalby to Roma.

The rail reached Chinchilla and Miles in 1878 and Roma in 1879. The construction of the railway came at a cost. Malaria was rife in certain sections. According to Kerr: 'The Government transported many of the sick back east, overcrowding hospitals in Dalby, Toowoomba and Brisbane. Several died in construction camps' (Kerr 1990: 36). According to Matthews (2004), 'many of the rail workers and their families' succumbed to fever and their 'lost graves, unmarked and long forgotten, litter the rail from Dalby to Roma' (Matthews 2004b: 964).

The old established pastoral centre of Taroom, north of Miles, had demanded a railway in order to promote closer settlement around the area since the late nineteenth century. Construction of the north-west branch of the Western Railway was approved in 1910 and Miles was chosen as the junction for the branch which would extend north to Wandoan. Construction began in October 1911 and by December 1913 a link was opened at Giligulgul, and at Juandah by 1914 (renamed Wandoan shortly after it was opened). The branch linked Miles to Wandoan, passing through stations at Kowguran, Guluguba and Giligulgul. Parliament had approved a second section of the branch to continue north another 68 km to Taroom from Wandoan in December 1913, however construction never began. The terminus at Wandoan was seen as sufficient to connect the areas around Taroom with a rail service (Kerr 1990: 115). The approval of the Taroom extension from Wandoan was just one of the many branches approved in 1914 which were never constructed.

From Roma, a branch line 47 km north to Orallo was approved by parliament in December 1911, and construction commenced in September 1914, after the Roma Town Council agreed to bear one third of the liability under an agreement validated by the *Roma to Orallo Railway Act* of 1913 (Kerr 1990: 115). The line was opened in September 1916. The branch to Orallo passed through the stations of Roma, Minka, Yingerbay and Oogara.

Since 1903, a railway which would continue past Orallo to the Mt Hutton region had been proposed as a measure to foster land settlement in the area, and to better connect the northern Maranoa district with the Leichhardt district. However, due to the fact that the line which had connected Roma with Orallo in 1916 was less than halfway to Mt Hutton and had been running at a loss, it was decided that it was not necessary to extend the railway further than Injune Creek, on the Upper Dawson valley. In 1915, the Ryan Labor Government proposed that only another 53km of track was needed for the areas north of Roma.

The proposal was accepted in 1916, and in June 1920, the rails reached Injune (Kerr 1990: 116). From Orallo, the northern Roma branch now continued through Bongwarra, Gunnewarra, to Injune. To service the thrice-weekly, five and a half hour service from Roma, an engine crew was based at Injune until 1963. Livestock trains were frequent on this branch until the Roma meatworks opened and road haulage replaced the railway. Coal traffic from the Maranoa Colliery near Injune began in 1932 and ended with the dieselisation of the railways west of Roma in 1963. The line from Roma to Injune closed at the end of 1966 after the closure of the colliery.

4.9 Mining

4.9.1 Coal

Before 1875, coal mining in Queensland had been largely confined to the south-eastern corner, especially around Ipswich and the Brisbane River (Whitmore 1985: 281). The advent of the railways gave impetus for the extension of coal mining districts away from the south-east quarter to central and north Queensland (Whitmore 1985: 281). Not merely did the advent of the railways increase the demand for coal for fuel, but the extension of the railways into central and northern Queensland during and after the 1870s also provided the means to retrieve and haul untapped coal resources in these districts to be used for coastal steamers and to be shipped overseas (Whitmore 1985: 281). The construction of the railway branches in section 4.8.3 was integral to the expansion of Queensland's mining industry.

The development of the Maranoa Colliery was an example of the development of a small coal mine to service the railways demand for coal. Coal in this area lies in the northern Darling Downs deposit (Hawthorne 1971:96). Government interest in the area was in the form of a coal prospecting licence, which had been issued over the area in 1913. Government exploration drilling was undertaken in 1922 and payable coal seams located in 1926 approximately four miles south of Injune. The coal licence was eventually taken up by Mr Fred Hart of Maranoa Colliery. Well known coal identity, William Binnie, who was by this time a board-member of several colliery companies, became the managing director of Maranoa Collieries Ltd. This was in addition to his duties as chairman of the West Moreton District Coal Board prior to it being taken over by Queensland Coal Board Production began in 1933. Coking coal was extracted from the underground mine using traditionally board and pillar methods for the Western Rail line between Roma and Cunnamulla http://www.geocaching.com/seek/cache_details.aspx?guid=8eb301dc-ff65-4fb1-aaa3-c2401aa4abc3).

In 1956 the Queensland Government conducted diamond drilling to assist in the planning of a re-organised haulage system and to prove reserves of coal in the field. The coal seams had been worked from four cross measure drifts although at this time only one (no. 4 adit) was operational as two had been destroyed by flooding, and the other temporarily abandoned due to shortage of workers. No. 4 adit was located adjacent to railway siding (Hawthorne 1956:2)

The transfer of livestock being transported to the Roma meatworks from rail to road and then the dieselisation of the railway in 1963 led to a decline in demand for coal. The colliery was closed in August 1963 and no coal is recorded for the Colliery from the first half of 1964 (Table IV on page 10 of the 13th Annual QCB report – CR 70632).

The existence of coal in Emerald had long been rumoured due to the discovery of coal in the surrounding areas. Coal had been mined from the 1860s in Blair Athol and Capella, both north of Emerald and from 1878 in Comet to the east (Reid 2001: 194). Recognising the possibilities for mining that the construction of the Central Railway line to Emerald, Clermont and Springsure had created, the Queensland Government persuaded the noted geologist Julian Tension-Woods to report on the possibility of finding coal reserves close to the Central Railway in 1881 (Whitmore 1985: 282). It was not until the 1970s that coal was mined in the immediate areas surrounding Emerald.

4.9.2 Oil and gas

From the time of Roma's founding, water had been a problem. In the late nineteenth century, several attempts were made to drill for water. Several wells were sunk but they yielded only scant supplies. While drilling for water on Hospital Hill in 1899, gas was found at a depth of 3683 feet (Roma Tourism Association 1998: 10).

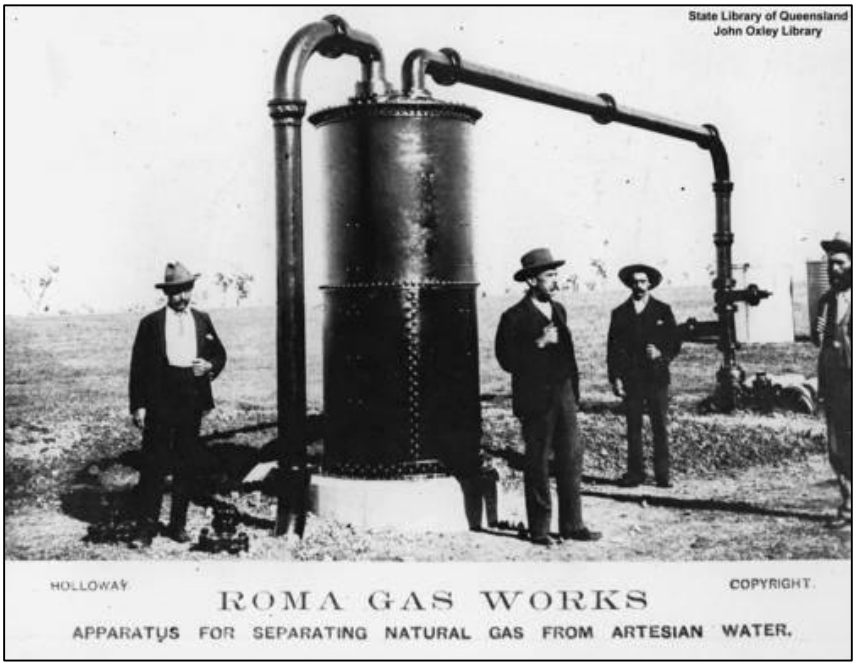

Figure 12: Apparatus for separating natural gas from artesian water at Romas Gas Works, Qld, c. 1906 (JOL Image number: 39114)

A report from the government hydraulic engineer in 1902 noted that the gas from this well (QG2), in its natural condition, gave an illumination value of twenty-four candle power, compared with the London standard of sixteen candle power. As a result, tenders were called for the reticulation of gas to the township. In 1906, a gasometer was completed on Hospital Hill, and gas mains extended from there to Bowen Street, Arthur Street and several others (Roma Tourism Association 1998: 10).In the early twentieth century, Roma became the birthplace of Australia's oil and gas industry. This was indeed an unexpected outcome. The oil industry steadily declined as the twentieth century progressed, but other industries continued to support the existence of Roma. Over recent years, Wallumbilla has developed into a centre servicing the agricultural and gas industries and has a population of around 300. Gas continues to be an important economic driver of the town and the surrounding region. Origin Energy's Spring Gully coal seam gas development is located about 80 km north of Roma and its gas field project includes an 87 km gas pipeline to Wallumbilla, to connect with the 434 km Roma to Brisbane gas pipeline hub. The proposed Spring Gully Power Station is an $870 million, 1000 MW power station that will provide electricity to south-east Queensland. The power station will have the benefit of being close to the source of gas and will also be able to use the waste water left over from other gas operations.

4.10 Other Industries

Closer settlement through the 1940s to 1960s also resulted in the growth of cropping industries in parts of the GFD Project area including around Wandoan and Roma.

For example, in the southern areas of the former Juandah lease settlers began switching to grain growing from the 1940s. With this cropping, paddocks were further developed and terracing introduced. The extent of the wheat crop in particular can be seen in the construction of grain dumps at the Guluguba rail siding in the early 1950s (Bahnisch and Stiller, 1992:43; Bonhomme Craib and Associates, 2008:16). One former resident remembers this as the start of the boom era for Guluguba (Bahnisch and Stiller, 1992:43).

In the late 1960s the success of beef cattle breeding and wheat growing in the Guluguba area was regarded as a factor in saving the school, which five years earlier had been threatened with closure (Bahnisch and Stiller, 1992:14). While some fodder crops are still grown in the area today, wheat is no longer a significant crop in the Guluguba area. It is however still grown around Wandoan.

Around Roma, the Maranoa's agricultural industry is worth $620 million annually, 64.3% of this being generated from crops. In the Maranoa area, 58.7% of the businesses are in the agriculture, forestry and fishing sector, which employs 32.7% of the region's workforce. Roma is the site of Australia's largest cattle sale yards. The region around Roma also Australia's most active native Cypress Pine milling (ARCHAEO 2009:49).

4.11 Irrigation Schemes

4.11.1 Nathan Dam

In the late 1880s the government surveyors, Henderson, McKinnon and Rigby, undertook surveys of Queensland's river systems and the Dawson River won high praise for its fertile black soils of excellent quality. A number of irrigation projects were suggested but progress was slow, hindered by the 1890s depression and infrastructure challenges. In the meantime, agricultural selectors deprived of regular water during poor seasons were required to excavate their own small dams, which proved of little value. Most could only hope for a bold, government-sponsored irrigation scheme that might unlock the productive potential of their land holdings (Converge 2012a: 45).

Construction of a large storage dam across the Nathan Gorge on the Dawson River to provide water for an ambitious Dawson Valley Irrigation Scheme was first suggested as early as 1921 when soil tests and diamond drill boring were carried out by government hydraulic engineer Charles Deshon. Given the variability of local rainfall and the suitable geology, the construction of large water storages using the Dawson River and its tributaries was considered a highly advantageous proposal (Converge 2012a: 46).

In 1926, Sir Matthew Nathan visited Nathan Gorge as the Government commenced planning for a dam there. A reserve of 669 acres 'for Official and Departmental Purposes' was gazetted around the gorge itself to prepare for the construction effort (Department of Natural Resources and Water: 1927) and a great deal of optimistic promotion was generated in support of the scheme and the region's agricultural potential. However, construction was beset by various difficulties and was eventually postponed in favour of smaller weirs built at Theodore (in timber, 1925 and rebuilt 1929) and Orange Creek (1932). A network of irrigation channels was also installed. Later still, the Glebe Weir was built in 1976 and another weir at Gyranda in 1987.

The proposed dam at Nathan Gorge had a deleterious effect on closer settlement and development in Taroom region. An article in the *Courier Mail* in 1958 highlighted the effect of the proposed dam on the township of Taroom: 'Progress has passed by this important cattle town of 600 people…which seems doomed to extinction. The boom years have come and gone to leave the old brigalow belt town on the banks of the Dawson River a centre of ancient and deteriorating buildings' (quoted in Rechner 2003: 174).

The dam proposal re-emerged in 1963, 1979 and again in 1995. Though development has not ceased altogether in Taroom, and the somewhat dire predictions made in the 1950s have not eventuated, the effect of the proposed dam remains significant.

4.11.2 Comet River Dam

For some two years after March 1996, the Rolleston area was subject to extensive public debate and assessment after the Queensland Government announced its intention to investigate the possibility of building a dam on the Comet River. The proposal included:

- The construction of a dam at a site on the Comet River at 125km called 'Starlee' (approximately 16 km north of Rolleston).
- The construction of a possible weir on the lower Comet River or nearby Mackenzie River.
- The conversion of the grazing and dry land cropping lands to irrigated cropping lands.
- The relocation of the local road network and the inundation of Rolleston (Pullar, 1999: 78).

As the *Courier Mail* put it on 26 April 1996, 'Rolleston was doomed to be submerged'. During 1996 to 1997 there were numerous reports commission to establish if the dam would go ahead: Kinhill looked at the Aboriginal culture and heritage issues and Margaret Pullar examined Rolleston's history which included an assessment by architect Michael Kennedy. The decision dragged on, causing rifts and uncertainty in the community. Finally in May 1998 the Courier Mail declared that:

> *The central Queensland town of Rolleston has been saved from a watery grave with an announcement by the State's Minister for the Department of Natural Resources that the Comet River dam proposal has been scrapped (Courier Mail, 7/5/1998).*

The Minister stated that reasons included:

> *Significant to severe impacts on the health of the Upper Mackenzie and Comet River Systems. That information, combined with further work by my Department, has indicated that the dam would not be environmentally sustainable… and the Government's position is that all water developments must be sustainable (Rolleston and District Working Party News, 25-05-1998: 1).*

5 Conclusions from Desktop Review

The project is planned for an area of Queensland rich in post-contact history. The project area is located within some of the earliest explored and settled regions of Queensland; the Maranoa and Leichhardt pastoral regions.

As such the historic themes relevant to the project area are central to determining whether a building or place should be included in a heritage register using the framework provided under the QH Act. This historical thematic framework was developed by Blake in conjunction with EHP (2005), which drew upon the Australian Historic Theme Framework developed by the Australian Heritage Commission (2001). The following main themes have been identified as being of particular relevance to the GFD Project area:

1. Peopling places.
2. Exploiting, utilising and transforming the land.
3. Developing secondary and tertiary industries.
5. Moving goods, people and information.
6. Building settlements, towns, cities and dwellings.
9.1 Primary schooling.

This is reflected in the contextual history for the GFD Project area which shows that from early exploration and pastoralism, towns began to develop with the inherent need to provide different facilities, such as schools and cemeteries, for an increased population. Government schemes, such as the soldier settler and more recently the Brigalow scheme, promoted closer settlement, the diversification of agriculture, and the development of a transport and communication system, resulting in inherent, substantial changes to the landscape. Mining industries such as the coal and gas industry developed over time with more recent industrial developments including the timber industry.

The register searches and collation of the fieldwork results of previous consultancies conducted within the GFD Project area identify over 163 known and potential places of NICH. Of these 39 places are identified on cultural heritage statutory registers. Collectively these places demonstrate the historical themes identified for the GFD project area.

Site types represented in the known non-Indigenous cultural heritage resource include:

- Explorer's campsites.
- Contact sites including massacre sites and sites showing evidence of Aboriginal and non-Indigenous occupation.
- Pastoral places including homestead complexes (including homesteads, cattle/sheep dips, meat houses, dairies, holding yards, shearing sheds, storage sheds and refuse dumps), fencing, bores, water storage ponds, bush camps, surveyors marks and terracing.
- Isolated graves and cemeteries.
- Historical precincts within towns such as Roma, Surat, Wallumbilla, Old Yulebah and New Yulebah.
- Roads, railways and stock routes and associated telegraph/telephone lines including old road alignments and roads which reflect specific phases of development (e.g. soldier settler roads), railways, sidings, stations and associated settlement and housing.
- Forestry industry places.
- Mining and quarrying sites including underground and open cut mines, oil bores and associated infrastructure.
- Memorials both to early explorers and soldiers.

The approximate locations of these NICH places are indicated in Figure 12. It should be noted that precise locations are not always indicated in the relevant registers and databases.

These results demonstrate the extent of the potential resource in areas within the GFD Project area which have not yet been subject to specific NICH assessments. For example the concentration of places located in the Taroom / Wandoan area reflects the results of several recent surveys. It also indicates that cultural heritage places of varying cultural heritage significance are likely to occur throughout the GFD Project area without any particular zoning.

The distribution of EPA listed places (Appendix A) suggests that this distribution is not necessarily linked to areas of higher population density although the distribution of these places may be a reflection of areas where research has been undertaken in the past rather than be a reflection of specific zones of higher cultural heritage significance.

This indicates that should similar surveys be conducted across the project area, a number of additional cultural heritage places of varying cultural heritage significance would be located and as such, the management of these places will require the implementation of the EHS11 cultural heritage and post EIS approvals processes in order to manage currently unknown sites and places of non-Indigenous cultural heritage significance.

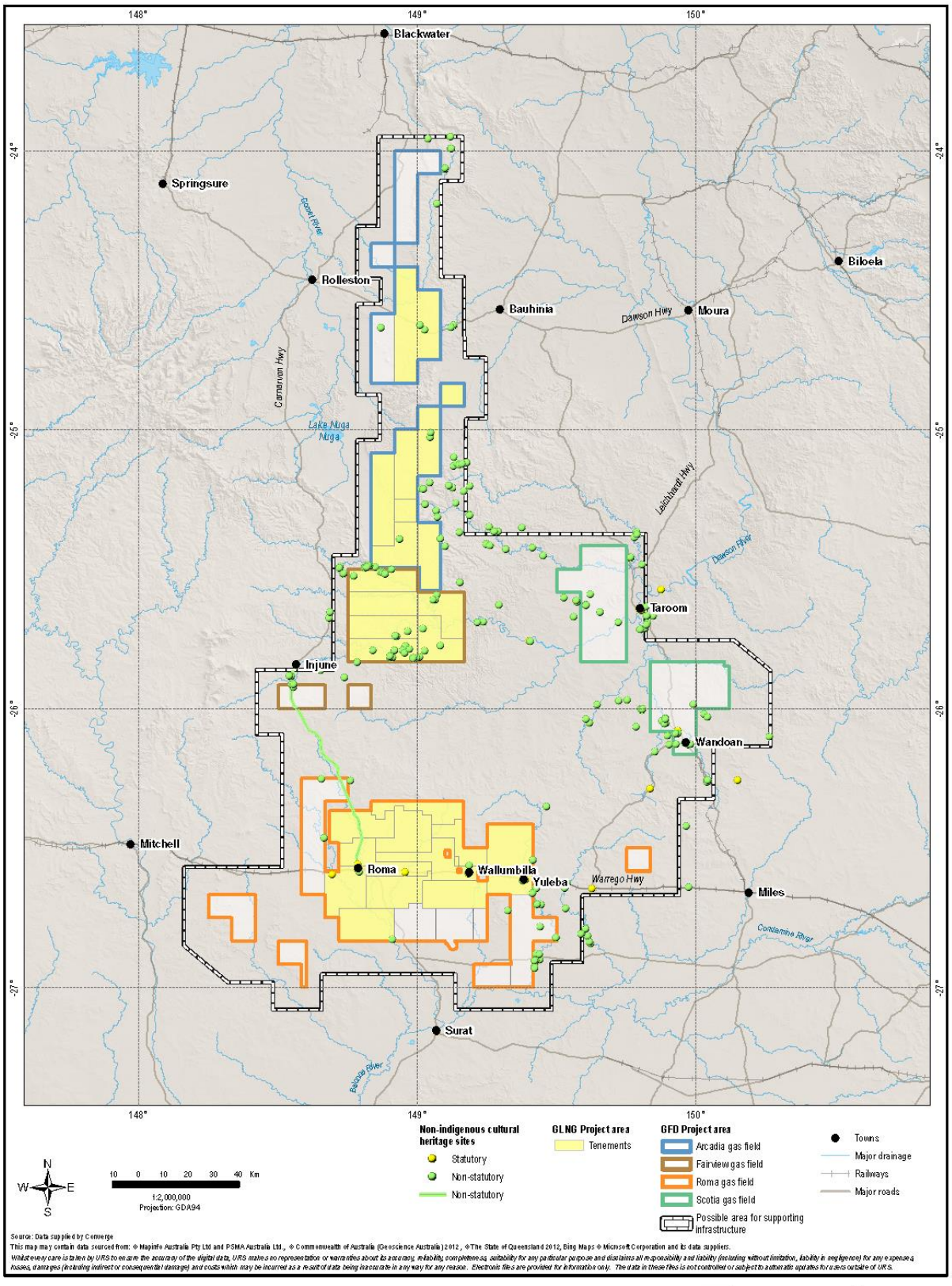

Figure 13: Location of NICH in relation to GFD Project areas (URS 2014: 42627064-g-20489c.mxd)

6 Potential Impacts

The GFD Project description (section 1.2) introduces the general nature and timing of the project.

The GFD Project will continue to progressively develop the Arcadia, Fairview, Roma and Scotia gas fields; however decisions about the actual location and timing of the next stages of field development will be made incrementally as the understanding of gas resources matures and potential production value is realised.

Potential direct impact on known significant NICH places by the GFD project will generally be in the nature of removal of the ground surface and sub-surface, vegetation clearance related to the installation of gas wells, the development of associated infrastructure such as roads, pipelines and buildings, and / or not following established processes for protecting cultural heritage e.g. interfering with sites.

6.1 Constraints protocol

As introduced in Section 2.3, the Constraints protocol sets out the approach Santos GLNG will take in identifying, assessing and managing potential impacts on environmental values, including NICH. The Constraints protocol applies to all gas field related activities. The scope of the Constraints protocol is to:

- Enable Santos GLNG to comply with all relevant State and Federal statutory approvals and legislation;
- Support Santos' environmental policies and the General Environmental Duty (GED) as outlined in the EP Act.
- Promote the avoidance, minimisation, mitigation and management of direct and indirect adverse environmental impacts associated with land disturbances; and
- Minimise cumulative impacts on environmental values.

The Constraints protocol applies to the life of the GFD Project (i.e. planning, design, construction, operation, decommissioning and rehabilitation), and will apply throughout the GFD Project area.

The Constraints protocol will enable Santos GLNG to systematically identify, assess and manage potential impacts to significant NICH places.

Potential (pre-mitigated) impacts are determined after the application of the avoidance measures. To avoid impacts, known NICH places on statutory registers within the GFD Project area, (including QHR places and LHR places) identified in sections 3.1.3 and 3.1.4 of this report, will be incorporated into the Santos GLNG Geographical Information System (GIS). These places will be considered when identifying the location of GFD Project infrastructure and activities to assist in the ongoing constraint planning and field development progress.

After Santos GLNG has identified a potential area for development in accordance with the Constraints protocol, the overarching mechanism for protecting cultural heritage is Environmental Hazard Standard (EHS) 11 Cultural heritage standard. Many project components such as wells, gathering lines, roads, camps and water storage that are typically developed in a dispersed arrangement allow some flexibly to locate to minimise impacts.

EHS 11 defines the processes to avoid, where practicable, or otherwise minimise impacts to cultural heritage from Santos GLNG operations and to ensure that relevant statutory cultural heritage requirements are complied with. EHS 11 is supported by cultural heritage field personnel and a cultural heritage management system, which ensures that construction work is undertaken according to the CHMPs and the ACH Act.

Implementation of EHS 11 will identify and avoid, where practicable, or otherwise minimise impacts on cultural heritage sites through awareness training, pre-clearance surveys to verify values, inform siting decisions, discovery, clearances and management. The *Santos GLNG Cultural heritage clearance process* is a core component of EHS 11 that encapsulates the steps Santos GLNG takes to identify and avoid, where practicable, or otherwise minimise impacts on culturally significant places prior to ground breaking activities. It involves the steps outlined in Figure 13.

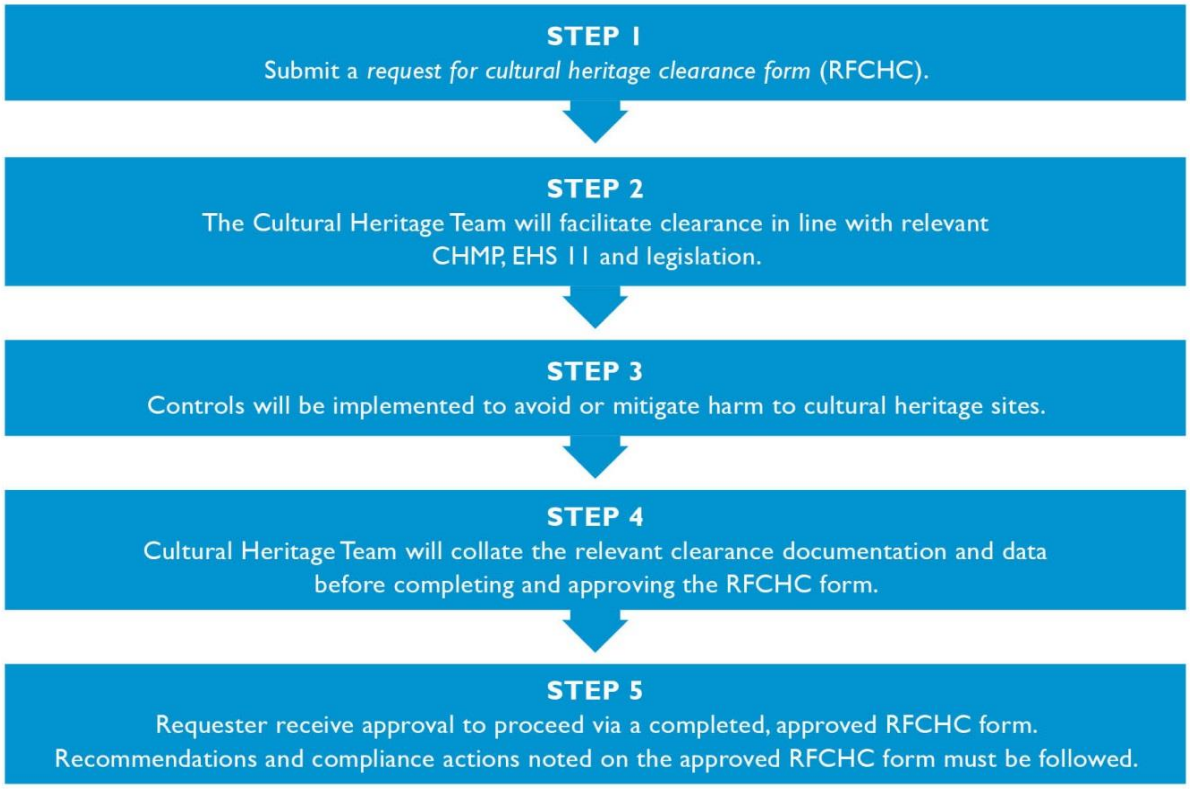

Figure 14: Santos GLNG cultural heritage clearance process

Where impact to a cultural heritage site is likely, Santos GLNG will obtain internal and statutory approvals in consultation with relevant stakeholders and conduct monitoring and reporting in accordance with relevant regulatory requirements.

EHS 11 also dictates the required actions to be undertaken during a chance find of cultural heritage. A copy of EHS11 has been provided in Appendix C.

6.2 Potential Impacts

This investigation has established that there are 273 known places of NICH within the GFD Project area, ranging from State and local cultural heritage significance, or known places that have not yet been assessed for significance (e.g. EHP-listed sites). The Santos GLNG management framework principles of avoidance, minimisation and mitigation aim to manage risks to NICH.

There is a high potential for further places of NICH significance that are currently unknown within the GFD Project area. These potential places are likely to relate to pastoral and settlement activities, such as, as historic town precincts, cemeteries, remote graves, homesteads and associated agricultural buildings telegraph/telephone lines, exotic vegetation, historic survey trees, roads and stock routes remnant boundary fence lines, old station dumps and the remains of early mining activities.

7 Impact Assessment

This chapter assesses the potential impact of the proposed GFD Project on the NICH places within the GFD Project area as defined by the possible area for development of infrastructure (see Figure 1). It also considers the cumulative impact of this GFD Project in light of other projects identified as being undertaken concurrently in the central Queensland area. The potential direct and indirect impacts assessed are:

- Impacts on known NICH places of State and local significance, and unassessed places.
- Impacts to unknown NICH places of National, State and local significance.
- Impacts to significant NICH landscapes.

7.1 Impact Assessment Methodology

A qualitative risk assessment was used which was based on *AS/NZS 31000:2009 Risk Management – Principles and Guidelines* and the Santos GLNG standard for hazard identification, risk assessment and control. The criteria used for likelihood and consequence of potential impacts on NICH is summarised in Tables 7 and 8.

Table 7: Likelihood of potential impact on places of NICH significance

Descriptor	Description
Almost certain Common	Will occur, or is of a continuous nature, or the likelihood is unknown. There is likely to be an event at least once a year or greater (up to ten times per year). It often occurs in similar environments. The event is expected to occur in most circumstances.
Likely Has occurred in recent history	There is likely to be an event on average every one to five years. Likely to have been a similar incident occurring in similar environments. The event will probably occur in most circumstance.
Possible Could happen, has occurred in the past, but not common	The event could occur. There is likely to be an event on average every five to twenty years.
Unlikely Not likely or uncommon	The event could occur but is not expected. A rare occurrence (once per one hundred years).
Remote Rare or practically impossible	The event may occur only in exceptional circumstances. Very rare occurrence (once per one thousand years). Unlikely that it has occurred elsewhere; and, if it has occurred, it is regarded as extremely unique.

Table 8: Consequence of potential impact on places of NICH significance

Descriptor	Description
Critical Severe, widespread long-term effect	Destruction of sensitive environmental features (e.g. significant NICH places or values). Severe impact on ecosystem (e.g. NICH place or landscape). Impacts are irreversible and/or widespread. Regulatory and high-level government intervention/action. Community outrage expected. Prosecution likely. Financial loss in excess of $100 million.
Major Widespread, moderate to long – term effect	Long-term impact of regional significance on sensitive environmental features (e.g. significant NICH values). Likely to result in regulatory intervention/action. Environmental harm either temporary or permanent, requiring immediate attention. Community outrage possible. Prosecution possible. Financial loss from $50 million to $100 million.

Descriptor	Description
Moderate Localised, short-term to moderate	Short term impact on sensitive environmental features (e.g. significant NICH place). Triggers regulatory investigation. Significant changes that may be rehabilitated with difficulty. Repeated public concern. Financial loss from $5 million to $50 million.
Minor Localised short-term effect	Impact on fauna, flora and/or habitat (or NICH) but no negative effects on ecosystem (e.g. NICH landscape). Easily rehabilitated. Requires immediate regulator notification. Financial loss from $500,000 to $5 million.
Negligible Minimal impact or no lasting effect	Negligible impact on fauna/flora, habitat, aquatic ecosystem or water resources (or NICH). Impacts are local, temporary and reversible. Incident reporting according to routine protocols. Financial losses up to $500,000.

The level of risk of each environmental impact was assessed by combining the likelihood and consequence criteria in a risk assessment process as shown in Table 9.

Table 9: Risk Matrix

Consequence	**Likelihood**				
	Almost certain	Likely	Possible	Unlikely	Remote
Critical	Very high	Very high	High	High	Medium
Major	Very high	High	High	Medium	Medium
Moderate	High	Medium	Medium	Medium	Low
Minor	Medium	Medium	Low	Low	Very Low
Negligible	Medium	Low	Low	Very Low	Very Low

7.2 Impact Assessment

The potential impact of the GFD Project on these unknown cultural heritage places is summarised in Table 10. The consequence of this impact will vary according to the relative significance of the place, and the risk is assessed on this basis.

Table 10: Residual risks – cultural heritage

Potential Impact	Phase	Pre-mitigated impact			Mitigation and Management Measures	Residual Impact		
		Likelihood	Consequence	Risk Level		Likelihood	Consequence	Risk Level
Disturbance/encroachment on known cultural heritage								
State	Construction	Unlikely	Moderate	Medium	• Implement the steps in the EHS11 as well as the constraints protocol in field development to identify, assess and manage potential impacts on NICH values. • Should works need to be conducted in these areas, Implementation of EHS 11 will identify and avoid, where practicable, or otherwise minimise impacts on cultural heritage places through awareness training, pre-clearance surveys to verify values, inform siting decisions, provides procedures for discovery, clearances and monitoring and reporting.	Remote	Moderate	Low
	Operations	Remote	Moderate	Low		Remote	Moderate	Low
	Decommissioning	Remote	Moderate	Low		Remote	Moderate	Low
Local	Construction	Unlikely	Minor	Low		Unlikely	Minor	Low
	Operations	Remote	Minor	Very Low		Remote	Minor	Very Low
	Decommissioning	Remote	Minor	Very Low		Remote	Minor	Very Low
Unassessed	Construction	Likely	Moderate	Medium		Unlikely	Moderate	Medium
	Operations	Remote	Moderate	Low		Remote	Moderate	Low
	Decommissioning	Remote	Moderate	Low		Remote	Moderate	Low
Disturbance/encroachment on unknown cultural heritage								
National	Construction	Remote	Major	Medium	Implementation of EHS 11 will identify and avoid, where practicable, or otherwise minimise impacts on cultural heritage places through awareness training, pre-clearance surveys to verify values, inform siting decisions, provides	Remote	Major	Medium
	Operations	Remote	Major	Medium		Remote	Major	Medium
	Decommissioning	Remote	Major	Medium		Remote	Major	Medium
State	Construction	Possible	Moderate	Medium		Unlikely	Moderate	Medium
	Operations	Remote	Moderate	Low		Remote	Moderate	Low
	Decommissioning	Remote	Moderate	Low		Remote	Moderate	Low
Local	Construction	Possible	Minor	Low		Unlikely	Minor	Low

Potential Impact	Phase	Pre-mitigated impact			Mitigation and Management Measures	Residual Impact		
		Likelihood	Consequence	Risk Level		Likelihood	Consequence	Risk Level
	Operations	Remote	Minor	Very Low	procedures for discovery, clearances and monitoring and reporting.	Remote	Minor	Very Low
	Decommissioning	Remote	Minor	Very Low		Remote	Minor	Very Low
Impact to significant NICH landscapes	Construction	Likely	Major	High		Possible	Moderate	Medium
	Operations	Unlikely	Moderate	Medium		Unlikely	Moderate	Medium
	Decommissioning	Unlikely	Moderate	Medium		Unlikely	Moderate	Medium

7.3 Cumulative Impact Assessment

The methodology used for cumulative impact assessment followed the steps below:

- Identification of standalone residual impacts of the GFD Project using existing baseline conditions.
- Identification of other projects to be considered in the cumulative impact assessment.
- Identification of appropriate spatial boundaries for the analysis of cumulative impacts.
- Identification of appropriate temporal boundaries for the analysis of cumulative impacts.
- Determine the relevance and significance of cumulative impacts.
- Develop suitable mitigation measures for the cumulative impacts.

The significance of this cumulative impact has been assessed using the criteria set out in the assessment matrix (Table 11 and impact matrix (Table 12) below.

Table 11: Cumulative impact assessment matrix (URS 2013)

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

Table 12: Significance of impact and consequences

Impact significance	Sum of relevance factors	Consequences
Low	1-5	Negative impacts need to be managed by standard environmental management practices. Special approval conditions unlikely to be necessary. Monitoring to be part of general GFD Project monitoring program.
Medium	6-9	Mitigation measure likely to be necessary and specific management practices to be applied. Specific approval conditions are likely. Targeted monitoring program required.
High	10-12	Alternative actions should be considered and/or mitigation measures applied to demonstrate improvement. Specific approval conditions required. Targeted monitoring program necessary

There are currently 26 projects which are in development stage within a 50 km buffer of the GFD Project area, identified in Figure 14. Cumulatively, the construction and operation of the infrastructure and activities associated with these projects, including the GFD Project, has the potential to generate cumulative impacts on NICH. These projects have the potential, when considered together, to change the character of the region through the reduction in the number and type of historic places and, as cultural heritage is a non-renewable resource, incrementally impact on the number and diversity of cultural heritage places within the GFD Project area.

The significance of this cumulative impact has been assessed using the criteria set out in Table 11 and 12. The significance of this impact is summarised in Table 13.

Table 13: Cumulative impact assessment

Residual Impact	Relevance factors				Sum of relevance factors	Impact significance
	Probability	Duration	Magnitude/ intensity	Sensitivity of receiving environment		
Impact to known NICH places						
State	1	1-3	2-3	2	6-9	Medium
Local	1	1-3	2-3	1	5-8	Low-Medium
Unassessed	1	1-3	2-3	2	6-9	Medium
Impact to unknown NICH places						
National	1	1-3	2-3	3	7-10	Medium-High
State	1	1-3	2-3	2	6-9	Medium
Local	1	1-3	2-3	1	5-8	Low-Medium
Impact to significant NICH landscapes	1	1-3	2-3	1-2	5-9	Low-Medium

This assessment recognises that it is difficult to determine the total cumulative impact on the NICH values of the region because the extent of the resource and GFD Project development is not fully determined and the proposed cultural heritage management strategies for the considered projects were not available at the time of the preparation of this report, hence the variable figures provided in some sections of the assessment table. However it is probable that similar mitigation and management strategies to those identified in EHS11 will be adopted for these projects to meet legal obligations to avoid, minimise and manage risks to NICH.

A written record of these places is therefore likely to be available into the future which may not otherwise have been the case. In addition combined and co-located infrastructure projects by other proponents and stakeholders such as development of integrated pipeline networks are likely to moderate potential impacts into a single development corridor rather than multiple corridors.

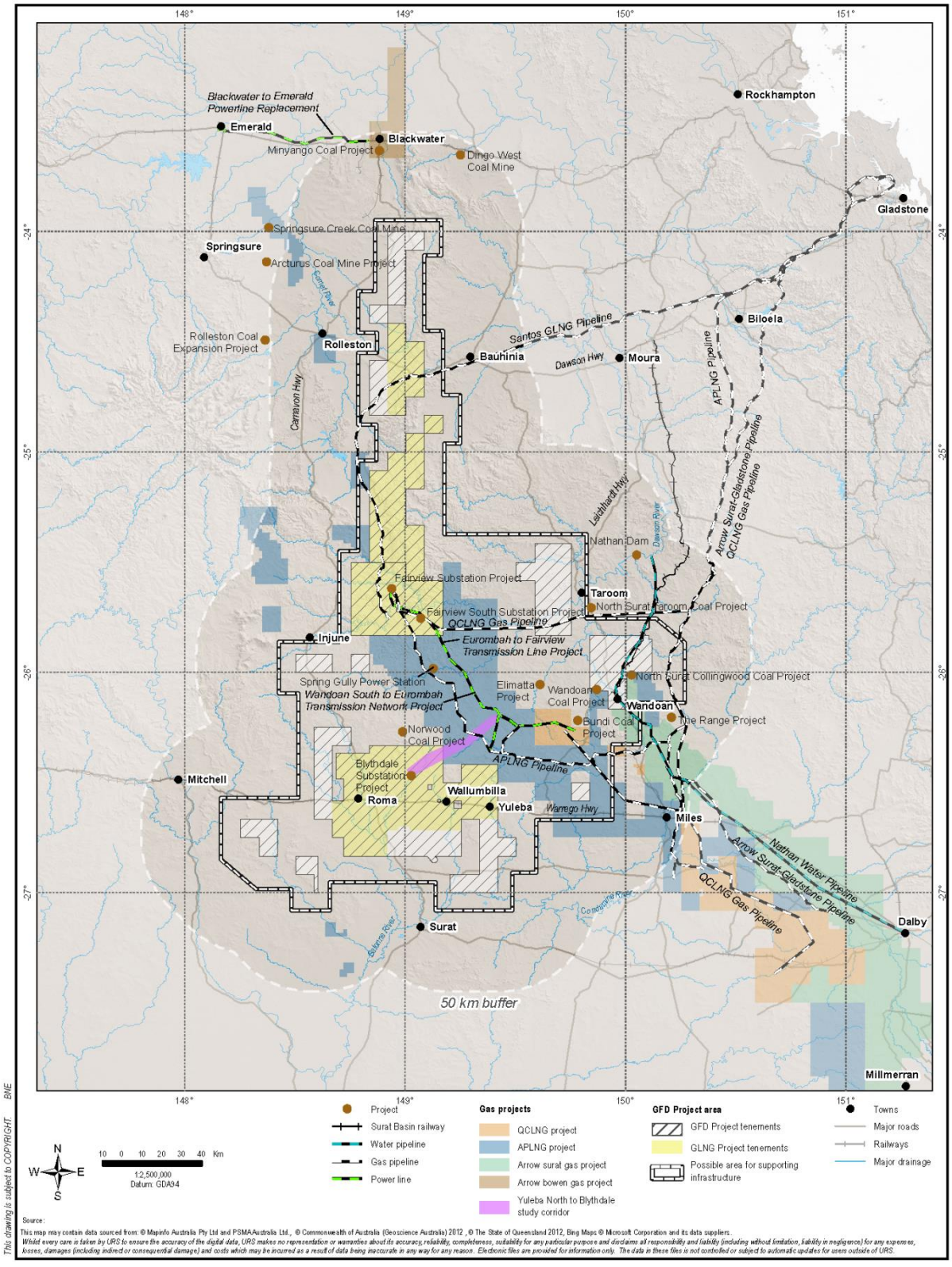

Figure 15: GFD Project area in relation to other planned projects (URS, 2013; 42627064-g-022c.mxd)

8 Recommendations

The GFD Project area is located within some of the earliest explored and settled regions of Queensland i.e. the Maranoa and Leichhardt pastoral regions. As such, the historic themes relevant to the GFD Project area (itemised in Section 5) reflect most aspects of the historical development of Queensland.

If the recommendations provided in this section are implemented, the level of impact associated with the GFD Project is considered acceptable from a NICH perspective, as the procedures will mitigate and manage the impact appropriately.

8.1 Use of Santos GLNG Standards, Protocols and Post EIS Protocol

This report has completed the assessment required by the ToR for the GFD Project in relation to the location and management of known NICH places. It identifies that it is likely that further unknown places of NICH significance exist within the GFD Project area.

It is therefore recommended that as the gas fields and associated infrastructure are developed over the life of the GFD Project that the existing EHS11 and the Constraints protocol (outlined in section 2.2) and the Constraints protocol (outlined in section 6.1) are implemented. The implementation of these planning documents will:

- Utilise data from this assessment to identify further areas that are likely to contain NICH places.
- Conduct further investigation of these areas, including ground truthing with targeted field surveys of the identified areas, as project development locations are specifically identified.
- Develop further site specific management recommendations for significant NICH places as required.

In addition the corporate EHS11 provides processes for:

- Cultural Heritage Clearances.
- Cultural Heritage site discovery management procedures.
- Cultural heritage awareness training for Santos GLNG employees and contractors.
- Supporting systems and procedures. This standard is included at Appendix C.

8.2 Historic Heritage Management Plan

It is recommended that Santos EHS11 Cultural Heritage, the Santos GLNG Constraints protocol be regarded as the historic heritage management plan for the GFD Project area.

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QSA ID 26691 Bauhinia Downs Run File

QSA ID 629759 Topographical map of Queensland from 1911 showing main roads, railway and telegraph lines, artesian bores and tanks, and heights above sea-level colour-coded. 40 miles to the inch. Survey Office, Brisbane.

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Queensland stock route map from 1914. Sheet 1. 30 miles to the inch. Survey Office, Brisbane. Courtesy of John Oxley Library, Item ID 629865.

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Appendices

Appendix A: EPA Listed Places

Place ID	Place Name	Location	
		Latitude	Longitude
23354	Old Range Route	-24.1875	149.072222
25189	Aboriginal Art Site	-24.17778	149.1625
25186	Wagon Flattened Angophora spp roots	-24.373611	149.133333
25183	Relocated Homestead (from 7C/9)	-24.633333	148.870833
25185	Toe Hold Bottle Trees	-24.640278	149.027778
25184	Camping and Water Reserve	-24.625	149.131944
25060	Graves	-25.025	148.047222
25277	GSQ Taroom oil bore	-25.118889	149.143056
25280	'Mapala' QPWS Ranger Office (Expedition NP)	-25.0975	149.132778
25285	Ruined Castel Creek Forestry survey camp (Presho)	-25.124167	149.153333
25286	Salsbury graves Ruined Castle Creek (Presho)	-25.121111	149.163611
25098	Stockyard and Graves	-25.129167	149.130556
25275	Presho's ruined Castle post and rail fence (Presho)	-25.116667	149.180556
25176	Presho's Ruined Castle boundary fence (Presho)	-25.095833	149.201111
23076	Leichhardt's Cave (?) (Presho)	-25.069722	149.215556
22865	Historic Scarred Tree, Reedy Creek Station	-25.067609	149.251347
23074	Chinese shepherd's camp, sheep yards and grave (Presho)	-25.081389	149.265
24272	Historic Graffiti, Ruined Castle Station	-25.114631	149.242165
25283	Presho's bore, tank and trough (Presho)	-25.089444	149.350833
25282	Rocky stockyards on Sandy creek (Presho)	-25.077778	149.3475
25281	Rocky Yards stockmen's camp and WWII internee camp, Sandy Creek (Presho)	-25.078889	149.345556
24240	Leichhardt's 1844 expedition Camp – 30 Nov to 3 Dec 1844 (Ruined Castle creek)	-25.15598	149.22835
25278	Reedy Creek station (Presho)	-25.177222	149.3475
25279	Reedy Creek station dairy (Presho)	-25.176667	149.343611
23078	'Amphitheatre' station well	-25.21	149.015278
23394	Dray Gully Holding Yards	-25.210658	149.022315
23077	Ropers Pass road	-25.188611	149.045833
23075	Glenhaughton #1 oil bore, camp and airstrip	-25.206667	149.128611
25284	Stockyard and loading ramp (Expedition NP)	-25.198611	149.113611
24239	Leichhardt's 1844 expedition Camp – 28 and 29 Nov 1844 (Glenhaughton Creek)	-25.2196	149.16918
23081	'JM' blazed tree (Expedition NP)	-25.2	149.191111
26039	Corduroy road	-25.266418	149.028986
23804	Turkeys nest and windmill	-25.289337	149.068647
25273	Amphitheatre Tin Hut	-25.3125	149.073611
25187	Engraving in Sandstone	-25.261111	149.140278
24238	Leichhardt's 1844 expedition Camp – 27 Nov 1844 (Starkvale – Robinson Creek Gorge)	-25.30326	149.18854
25097	Starkvale Shepherd's Hut site	-25.305698	149.190232
23355	Homestead site (moved to 7C/10	-25.391667	148.9375
23540	Fold, Yards and Hut	-25.390278	149.083333
25096	Sheep Fold A (Taroom)	-25.366667	149.154167
24237	Leichhardt's 1844 Expedition Camp – 26 Nov 1844 (Rosey Creek)	-25.34748	149.26086
25114	Old Bronco Yard	-25.409722	149.248611
25267	Old Horse Paddock	-25.413889	149.2625
25103	Old Windmill	-25.408333	149.251389
25268	Washpool	-25.363889	149.279167
25099	Glenhaughton Homestead	-25.35	149.377778

Place ID	Place Name	Location	
		Latitude	Longitude
23539	Glenhaughton Outstation	-25.416667	149.1
24235	Leichhardt's 1844 expedition Camp – 23 and 24 Nov 1844 (Robinson creek)	-25.42692	149.318
24234	Leichhardt's 1844 expedition Camp – 22 Nov 1844 (Robinson creek)	-25.42083	149.41578
24233	Leichhardt's 1844 expedition Camp – 21 Nov 1844 (Robinson creek)	-25.44999	149.45364
25108	Grave site (Ringy's wife)	-25.456944	149.766111
24403	Palm Tree Creek Homestead	-25.459796	149.766257
24406	Palm Tree Creek Native Police Barracks	-25.481935	149.807395
23477	Harvester Crash Site	-25.49374	148.8118
24265	Lonesome Lookout	-25.49082	148.81523
25332	Stone Causeway and Timber Bridge Dawson River 2nd crossing	-25.491667	148.820833
23057	Thiess Brothers Toad Gang Camp (three slabs, Brigalow Scheme Road)	-25.49409	148.81313
23722	Camp site, Fishing Hole on Dawson River	-25.49453	148.72203
23612	Rough Bough Duffers Fence on Ridge	-25.49013	148.72471
24472	Road accident death site	-25.52422	148.7735
25330	Aboriginal Axe Grinding Grooves (Arcadia)	-25.484722	148.827222
25329	Stone Causeway Dawson River 3rd Crossing (Arcadia)	-25.4875	148.829167
25331	Stone Shelter and Cave (Arcadia)	-25.484722	148.825
22874	Stockyards	-25.4919	148.85091
23220	Stockyards	-25.4919	148.85091
24088	Flo Kilpatrick's Camp (ruin of hut, draft horse stables and dray)	-25.51149	148.87665
24018	The Candlesticks Road (disused track, old route from Arcadia valley via Dawson River to Injune Road)	-25.50803	148.86953
23083	Red dam, bore and windmill	-25.49887	148.90862
23080	Air Strip B (Carnarvon Range)	-25.591667	149.069444
24823	Air Strip C (Carnarvon Range)	-25.608333	149.058333
24822	Glenhaughton Mustering Shed (Carnarvon Range)	-25.608333	149.065278
25270	Belington Hut	-25.545833	149.154167
25272	Wagon Gully Yards	-25.627778	149.294444
25111	Sheep Fold B	-25.601389	149.526389
25116	European graves	-25.6125	149.570833
25115	Shepherd's Grave	-25.616667	149.575
25062	Turtle Creek Homestead	-25.669444	149.5625
25113	Charlie Gin's Grave	-25.629167	149.606944
25112	Sheep Fold C	-25.625	149.605556
25118	Mill Site	-25.588889	149.620833
25179	Washpool	-25.652778	149.656944
25266	Kinnoul Homestead and cemetery	-25.688889	149.722222
25119	Hornet Bank Massacre Site	-25.758333	149.408333
24821	Dead Man's Cave	-25.6875	149.2375
25271	Baroondah Homestead and yards	-25.688889	149.216667
24507	SF sign and post wall, east side Carnarvon Highway	-25.67359	148.68533
22314	Juandah homestead	-26.127895	149.973797
24626	Timber shelter shed	-25.65329	148.68719
23363	Sheep Fold	-25.7125	149.020833
23368	BuQNT House Site	-25.720833	148.966667
23364	Bonnie Doon Homestead	-25.740278	148.927778
23365	Wool Washpool	-25.8875	148.740278

Place ID	Place Name	Location	
		Latitude	Longitude
24034	Mount Hutton Homestead	-25.833333	148.784722
22825	Blazed trees	-25.82658	148.9057
23703	Bushman's Arms site ruin, Hutton Creek	-25.80962	148.9039
24805	Jack Carmichael's Inn	-25.816667	148.902778
23362	School Site	-25.811111	149.902778
24566	Stockyards Site	-25.81155	148.9036
24572	Stone causeway, Injune-Taroom road	-25.81604	148.91245
23373	Pony Hills Forest station	-25.799722	148.955556
23296	Sawmill (Taroom)	-25.790278	148.948611
23295	Dam	-25.775	148.959722
22315	Camping Reserve and Sock Route Wandoan/Taroom Shire	-26.127603	149.905454
25247	Pony Hills fire lookout	-25.816944	148.998889
23294	Pony Hills telephone line	-25.814167	149.008889
24806	Well, windmill and tank	-25.773611	149.083333
25249	Homestead Site (relocated to BBS-9A 7)	-25.819444	148.986111
25247	Pony Hills fire lookout	-25.816944	148.998889
23367	'Pony Hills' station dam and bore	-25.815833	148.986667
22891	Possum Park Bomb Dump	-25.967609	149.753946
23371	Coal Quarry	-25.883333	148.548611
23370	Dance Hall Site	-25.9125	148.557222
23369	Komine Rail Siding	-25.9125	148.55
23366	Komine School Site	-25.922222	148.556944
24173	Gubberamunda QFS camp and barracks	-26.25691	148.76103
22892	Forestry camp	-26.35	149.46666
25337	Sim Graves (Orallo road)	-26.4625	148.666111
23890	Conloi No. 1 Oil Well	-26.42119	149.96501
2490	Bridge Roma	-26.584207	148.792676
23702	Burton's Furulmundi Sawmill	-26.40824	150.0489
24175	Gurulmundi Forest station (camp and barracks site)	-26.40991	150.04913
24176	Gurulmundi Forest station (truck shed)	-26.4104	150.04978
23645	Graves – Roehrig family	-26.63823	149.97429
24150	Grave and memorial	-26.64	150
25258	Large Cypress Pine	-26.542778	149.417222
23124	Chinese Railway workers Graves	-26.62668	149.53413
24818	Homestead (Bendemere Shire)	-26.64209	149.53046
24819	Tchanning Township	-26.62391	149.53809
25259	Yuleba Forest station and Inglebogie Fire Tower	-26.64	149.425278
25260	Yuleba Forestry survey camp	-26.643611	149.429722
23530	Old Ulebah (Yuleba) township site	-26.7	149.431667
23977	Old Dalby to Roma Road and Telegraph route	-26.70047	149.44634
24817	Forestry Camp Married Quarters	-26.71423	149.53306
25261	Native Wells Rest area (Yuleba)	-26.7225	149.326944
23537	Bungil Creek Native Mounted Police Camp	-26.82506	148.91186
24809	Blazed tree	-26.9219	149.42292
24810	Old P and R Yards	-26.9291	149.42408
25265	Sawmill (Warroo Shire)	-26.8792	149.44012
24808	Yuleba Creek Forest Station	-26.88829	149.43629
25254	Yuleba Creek school	-26.89189	149.43637
24815	Stockyards (Warroo)	-26.81951	149.49919
25256	Yuleba Creek blazed tree	-26.901944	149.428333
25257	Yuleba creek stockyard	-26.901944	149.422778
25264	Chinaman's Grave	-26.8776	149.42801

Place ID	Place Name	Location	
		Latitude	Longitude
24807	Fire Tower (Warroo Shire)	-26.77988	149.44302
25253	Yuleba Fire Tower No. 1	-26.779722	149.443889
23937	Dalby-Roma Road point (Comp 80-81) Tchanning Creek crossing)	-26.80424	149.59197
25252	Tchanning creek coach road crossing	-26.805278	149.5875
24814	Homestead	-26.78692	149.60505
25262	Emmerson brothers Tchanning Creek sawmill (late 1941 – late 1950s)	-26.834167	149.618889
24811	Sawmill (Murilla Shire)	-26.84074	149.62237
23938	Dalby-Roma Road point (Comp 86) stump and log retaining structure on west side of road	-26.81299	149.6121
24813	Sawmill	-26.84166	149.66967

Appendix B: Significant NICH Places identified by previous consultancies

Source	Place	Name	Summary Description	GPS Co-ordinates		Register
				Latitude	Longitude	
ARCHAEO 2009	HAS-01	Surat Precinct	• Surat (Warroo) Shire Hall (QHR; LGR). • Astor Theatre (QHR; LHR). • Cobb and Co. Station. • Mitchell's Garage. • Surat Post Office. • Surat Shops. • Burrows St Residence.	149.06263	-27.15229	QHR, LHR
	HAS-02	Roma Precinct	• Ladbroke's State Butchers Shop (former) (RNE; QHR; QNT). • Hibernian Hall (RNE; QHR; QNT). • James Saunders And Sons Chemist (QHR). • Ace Drapers No. 1 (RNE; QHR; QNT). • School of Arts Hotel. • Old Roma Government Complex (QHR; QNT). • Old Queensland Congregation Church. • Roma Court House and Police Buildings (QHR; QNT). • Roma State School. • St Paul's Cathedral and Hall. • War Memorial and Heroes Avenue (RNE; QHR; QNT). • Romaville Winery (RNE; QHR; QNT). • Roma Station. • Abandoned Hotel. • Old Store. • Commonwealth Hotel. • Roma State College. • Masonic Temple. • Roma Neighbourhood Centre Old Shop. • Queen's Arms Hotel. • Shop Facades x4. • Western Star. • Buckenham Brothers.	148.79057	-26.57388	QHR, LHR QNT,RNE, EPA

Source	Place	Name	Summary Description	GPS Co-ordinates		Register
				Latitude	Longitude	
			• Roma's Largest Bottle Tree. • Royal Hotel. • The Grand Hotel. • Empire Hotel. • Old Store. • Roma Uniting Church. • Roma Saddlery.			
	HAS-04	Possum Catchers Cave	Approximately 250 metres (m) north-west of the Carnarvon Hwy on bend in the Dawson River. The rockshelter has evidence of Indigenous and European occupation and is associated with a large axe grinding site with many grooves located in the Dawson River to the north-west. The sandstone floor of the natural cave has been quarried for stone blocks used to construct a small store room.	148.64426	-25.34898	
	HAS-06	Old Ulebah Township	Former location of the township of Ulebah that moved to its current site (Yulebah) when the rail line was installed in 1879. Previous occupation identified by non-native plantings and several large artefact scatters along what was once Creek Street and on the creek bank where Condamine and Komo Roads meet the creek. The scatters comprise broken glass and porcelain, nails, buttons and other remnants of occupation.	149.43325	-26.69845	
	HAS-07	Hutton Creek Settlement Site	Located approximately 700 m north of the Injune-Taroom Road on the south bank of Hutton Creek. The site comprises remnant stockyard with artefact scatters in the area of the school and the foundations of the inn. The old Injune-Taroom Rd is clearly visible within the landscape as are its creek jump ups and cutting to the north east of the Hutton Creek site (site HAS-10).	148.90281	-25.81202	
	HAS-10	Injune to Rome Rail Line	The line begins where Curry Street Roma crosses the Roma to Mitchell rail line. The line runs in a generally north west direction from Roma to Injune. The line is notable in that it is clearly visible in the landscape either as it still stands or as part of roads. Roads that use the old rail corridor still make use of the old railway culverts, simply compacting additional dirt on the line to widen it for cars. Many of the properties (Alicker, Eumina, Orallo, Yingerbay, Euthalla etc.) carry the names of the old settlements that once stood on the rail line.	From 148.77119	-26.57798	
				To 148.56721	-25.84098	

Source	Place	Name	Summary Description	GPS Co-ordinates		Register
				Latitude	Longitude	
	HAS-11	Dalby Roma Telegraph Line	Approximately 6.5 km south west of Yulebah on the Mongool Rd. The telegraph line consists of poles, spaced approximately 50 m apart, which are made of cypress and use porcelain insulators. The line runs along the south side of the road except for the last pole which is on the north side.	From 149.41646	-26.65993	
				To 149.40546	-26.65357	
	HAS-12	New Yulebah Precinct	Yulebah, like Surat, has an affinity with the history of Cobb & Co, and also to the rail line. The town moved to the present location when the rail head was extended to the current site of Yulebah in 1879. The town is planned to a grid and has a very spread out feel to it due to the number of large lots and lots that have not seen development. Sites on LHR include the railway station, Combidiban Creek bridge.	149.38036	-26.61481	LHR
	HAS-13	Wallumbilla Precinct	Wallumbilla, like Yulebah, is laid out in an open grid pattern, whose southern areas are dominated by the massive grain shed and the large Federal Hotel. The northern section of town is very similar to other towns in the area except for the number of fine Queenslander style houses it possesses. Wallumbilla has a strong affinity with the history of the rail line and grain shed with the town museum forming a centre piece of the celebration of this history. Sites on the QHR and LHR include the hospital and railway. Other sites with significance include the Queen's Theatre, Wallumbilla Grain Shed x2, Wallumbilla Post Office and Harland's Store.	149.18629	-26.58702	QHR, LHR
	HAS-14	Wooden Homestead Complex	Located 2.5-3.25 km North of Wallumbilla and comprising two homesteads and two worker's quarters. Buildings are of timber frame and board construction with a corrugated iron roof; are unpainted and in various states of disrepair, with the workers' quarters in the poorest condition and the southern homestead the best. The southern homestead has had some recent repair works done which includes a new roof and steel stumps.	149.18965	-26.56206	
	HAS-15	Gallipoli Hill Sand Mine	Approximately 4.75 km south-south west of Injune. There is evidence of large scale sand mining right across the eastern, northern and western sections of the hill. Unwanted sandstone boulders have been piled on various parts of the hill. There is a large amount of discarded farm machinery, refuse and stumps of removed buildings on the east face of the hill.	148.54209	-25.88137	

Source	Place	Name	Summary Description	GPS Co-ordinates		Register
				Latitude	Longitude	
	HAS-16	Vertical Board Homestead Complex	East of both the Carnarvon Hwy and the Roma/Injune Railway. The main building is of an external frame and vertical weatherboard construction with a corrugated iron roof. The building's roof and veranda are collapsing and have exposed the interior to the elements. There is a large amount of house hold waste scattered within and around the building. There are also a fibro workers quarters, wooden meat locker and outhouse and several more modern sheds associated with the complex. There are used and disused water tanks to the rear of the complex.	148.65431	-25.86096	
	HAS-17	Autumn Vale Homestead	Approximately 11.75 km west of Injune on the south side of the Injune-Taroom Road, the site consists of a main building made up of an external frame and vertical weatherboard construction with a corrugated iron roof. It appears to still see some use for storage.	148.68352	-25.85002	
	HAS-18	Injune Precinct	Injune has a strong affinity with its history, as the rail head for the Roma-Injune line and the Carnarvon Gorge area to the north. Injune, like many other towns in the area, has many small older homes that add to the general heritage character of the town's residential areas.	148.56618	-25.84310	
	HAS-19	Moonah Telegraph Line	Within the Santos GLNG Fairview gas field, along the Basin Road from Moonah Station entrance to 1.5 km south-south west near Spring creek. The poles are made of cypress with porcelain insulators and are spread approximately 50 m apart. Several poles in the line are missing and others have fallen over time. Altogether there are fifteen poles.	From 148.91940	-25.79002	
				To 148.91532	-25.80242	
	HAS-20	Bonnie Doon Homestead	Approximately 13.75 km south-south east of Campo Santo. The site consists of the stumps, front stairs and rear room of the now removed Bonnie Doon Homestead. There are remains of fencing, gardens, chicken shed, cattle shed, machinery shed and other farm detritus spread about the area. EPA site (23364).	148.92237	-25.73888	EPA
	HAS-24	Old Dawson Highway Alignment	The historical route of the Old Dawson Highway is currently visible as a single lane, unsealed stretch of road that winds its way through the hills adjacent to the current Dawson Highway. This section of road deviates to the north of the current sealed Dawson Highway. A marked survey tree is set back approximately 3 m from the side of the road and features a clear axe cut survey scar approximately one	149.01151	-24.62426	

Source	Place	Name	Summary Description	GPS Co-ordinates		Register
				Latitude	Longitude	
			metre from the ground. Two fallen telegraph pole were observed in the vicinity of the Old Dawson Road, which retains metal fittings, wires, nails, a nearby vitrified ceramic insulator and metal axe marks.			
	HAS-25	Camping Reserve	No apparent evidence of camp site at time of survey. A survey tree is nearby facing the Dawson Highway.	149.13175	-24.62382	
	HAS-45	Survey Tree	The survey scar tree is located adjacent to the current Dawson Highway, south east of Rolleston approximately 10 – 15 m from road. Ghost Gum with east facing survey approximately 1 metre from the ground and is approximately fifty centimetres high by twenty centimetres wide. Etched lettering of the number **8** below the letters **MR**, both surmounted by a surveyors arrow.	149.12139	-24.63052	
Bonhomme Craib & Associates 2008	Wandoan 1	Dairy Complex	Located approximately 6.7 km northwest of Wandoan. 1950s timber, fibro and corrugated iron milk shed, concrete silo platform and timber yards.	149.89791	-26.09586	
	Wandoan 2	Dwelling	Located approximately 6.7 km northwest of Wandoan. Fibro and timber house low set house with external framing.	149.89832	-26.09663	
	Wandoan 3	Storage Shed and garage	Located approximately 4.7 km north-northwest of Wandoan. 1950s sawn timber and corrugated iron, two room shed with car chassis.	149.92713	-26.08858	
	Wandoan 4	Telegraph/Telephone pole, Wandoan Jackson Rd/Grosmont Rd	Two of bush timber poles parallel on the corner Wandoan Jackson Rd and Grosmont Rd. EPA listed place (22315).	149.90545	-26.12760	EPA
	Wandoan 5	Soldier Settlement roads	Peakes Rd: example of soldier settler road.	149.92866	-26.12625	
	Wandoan 6a	Boundary Fencing,	Located on Avon view Grosmont Road. Circa 1890s boundary fence alignment.	149.78609	-26.06352	
	Wandoan 6b	Survey Tree,	Located Avon view Grosmont Road. Dead tree with marked blaze and smaller blaze at base.	149.78601	-26.06348	
	Wandoan 8	Booral Homestead Complex.	Located on Booral Rd. Includes c. 1900 homestead (which has been modified), meat shed, tick reservoir (cattle dip), rubbish dump, split post fencing and plantings.	149.87913	-26.04251	

Source	Place	Name	Summary Description	GPS Co-ordinates		Register
				Latitude	Longitude	
	Wandoan 9	camp, Juandah Creek, Booral Rd	Public Employment Road Gang camp, c. 1930s.	149.89114	-26.03424	
	Wandoan 10	Coach stop	Located adjacent to Juandah creek in the Coach paddock. Two fence/gate posts with remnant fencing.	149.89162	-26.03602	
	Wandoan 11	Government Dam	Located on Avalon property. Earthen dam with southern cross windmill. Circa 1952.	149.88799	-26.05278	
	Wandoan 12	Dairy Farm	Avalon property in Booral area. Remains comprise fencing, yards and some house and farm debris. C. pre WWI.	149.89197	-26.05207	
	Wandoan 13	Wolobee Creek Bridge	Located on the Wandoan Jackson Rd. High level wood bridge, no railings, upgraded with asphalt surface.	149.85241	-26.15373	
	Wandoan 14	Survey Tree	Main Roads 1950s survey tree. Blaze arrow/MR/$7^{1/2.}$	149.85285	-26.15409	
	Wandoan 15	Survey Tree	Dead tree with two blazes.	149.93506	-26.08904	
	Wandoan 16	Camp	Sylvan Hill. Possible ring barker's camp. Artefact scatter comprising bottles and other; debris.	149.80654	-26.00175	
	Wandoan 17	Survey Tree	Soldier Settler survey marker. Blaze on Belah tree.	149.80308	-25.99957	
	Wandoan 18	Holding yard posts	Sylvan Hill, portion 52 block. Remnants of small holding yard.	149.80949	-26.00117	
	Wandoan 19	Wainwright's 'Grosmont' track and sheep fence	Trace of track and remnants of sheep/dingo fence, c. 1930s located on Sylvan Hills Portion 52 block. Fence alignment east-west.	149.80892	-26.00047	
	Wandoan 20	Wainwright's Bridge	Remnants of wooden bridge constructed over Mud Creek. Uprights on the east margin and girders in the creek bed. Located on Sylvan Downs Portion Block 52. C. 1930s.	149.80751	-26.00489	
	Wandoan 21	'Settler's Bridge' Mud Creek	Located on Mud Creek. C. 1960s single lane wooden bridge.	149.80412	-26.00390	
	Wandoan 22	Road reserve survey marker	Blaze tree located on south side of road with blaze arrow/BM/5. C. 1940s.	149.72366	-25.97068	

Source	Place	Name	Summary Description	GPS Co-ordinates		Register
				Latitude	Longitude	
	Wandoan 23	Juandah Homestead Complex	Converted to a historic museum/precinct including homestead and outhouses with early machinery with smithy shop, school house and museum introduced to site.	149.97329	-26.12773	EPA
	Wandoan 24	Juandah creek bridge	Remnant bridge over Juandah creek south of homestead.	149.98070	-26.12706	
	Wandoan 25	Wandoan Jackson Road stock route/road reserve	The Wandoan Jackson Road now occupies the stock route. A remnant telegraph line parallel with the road is also apparent. Middle point of route located with GPS.	149.92866	-26.12625	
	Wandoan 26	Wandoan Railway	Railway station. Terminus of the Miles to Wandoan line. Station house has been moved to the Wandoan Cultural Centre.	149.96143	-26.12240	EPA
	Wandoan 27	Wandoan Cemetery	Cemetery located on low rise on west side of Leichhardt Highway. Headstones face east. Front of cemetery lined with bottle trees.	149.93576	-26.07794	LHR
Converge 2011	Site 4	Yard complex and cattle dip	Yard complex with cattle dip, loading ramp and two races located with an area approximately 100m by 40m.	149.61817	-26.05098	
	Site 10	Ryals Homestead and Shed	Complex lies on the south-west side of a steep hill within the station 'Retreat' on the south side of an internal track. The land is gently sloping south to Horse Creek and a dam lies between the homestead and the creek. A relatively recent powerline (c. 1960s) runs away from the property to the north east. The homestead area comprises homestead and large shed.	149.60640	-26.03683	
	Site 15	Homestead 4 'Caneby' & dam	Lies on the west side of Perretts Road within Currawong station on the northern side of a hill which rises to the south. Horse Creek lies to the east on the east side of Perrettts Road. The complex comprises two houses, sheds, silos and a dam.	149.64623	-25.98429	
Converge 2012a	T001	Lilyvale Homestead Complex	Homestead complex comprising variously dated homestead, school house, two bottle dumps, machinery shed, dairy and holding yard.	149.825	-25.6923	
	T003	Native Police Camp	Open grassed area on top of hill near Back creek. Two slip rail posts and knapped stone artefacts.	149.8185	-25.7101	
	T004	Leichhardt's Lilyvale Camp	On bank of Juandah creek. No surface evidence of camp.	149.8001	-25.71601	

Source	Place	Name	Summary Description	GPS Co-ordinates		Register
				Latitude	Longitude	
	T005	Leichhardt Blazed Coolibah Tree	Large dead Coolibah on banks of Juandah creek. Thought may be evidence of Leichhardt's exploration.	149.8007	-25.7161	
	T006	Section of Coach Route	45m section of old coach road within Lilyvale station. Sandstone cobble which may have been laid across boggy section. Route extends to NW and SE. Also stock route.	149.82231	-25.69938	
	T008	Baxter's Wooden Hut	Located off Racecourse Rd. Wooden framed, weatherboard clad hut with corrugated iron skillion roof. One room low stumped, other room has earthen floor.	149.8245	-25.6671	
	T009	Baxter's Homestead site	Located off Racecourse Rd. Site covers an area approximately 20 m^2. Deposit includes stumps, fencing, garden border and rubbish dump.	149.82445	-25.66702	
	T010	Clarris Dump	Household refuse dump within area approximately 8 m^2 said to contain refuse of three generations from 1890s to 1960s.	149.82600	-25.66823	
	T026	Stock routes M423/U723	A5 route branching through the tenure on approximately the coach route alignment. Also Nathan Rd. No material evidence found relating to these stock routes beyond modern signage.	See Figure 14		
Converge 2012b	C005	Meads Shearing Shed	Timber framed, wooden floored structure with gabled Trimdeck roof and cladding. Wool sorting table, classing bays, chutes and pens still extant. Also remains of two Cooper/Sunbeam friction drive shearing stations.	150.0291	-26.0189	
	C010	Round Waterhole Leichhardt's Camp	Grassed area on bank of Creek. No surface artefacts evident.	150.0413	-26.0289	
	C011	Jack Pike's Woolshed	Timber framed, vertical weatherboard clad wool shed approximately 7 m by 12 m. Gabled roof. Chute, classing bays evident. Sheep dip associated with shed.	149.9909	-25.9811	
	C012	Jack Pike's Homestead	Wooden framed low set house with corrugated iron hipped roof. Wooden framed windows, Open verandah on north side. Concrete ramp to kitchen on eastern side.	149.9916	-25.9831	
Converge 2012c	W002	Guluguba State School	The site is comprises a headmaster's house and yard, a school building, an ablutions block, and a large school yard with a tennis court, cricket nets, a new shelter shed and a small open sided shelter.	150.04398	-26.25711	

Source	Place	Name	Summary Description	GPS Co-ordinates		Register
				Latitude	Longitude	
	W004	Guluguba Settlement	Located adjacent to the south of Guluguba School, on the west side of the Leichhardt Highway. Artefact scatters with no standing structures visible. Surface artefacts and debris with occasional concentrations in places averaging five per square metre. Area also includes Guluguba siding and associated concrete infrastructure (W005).	150.04443 150.04644 150.04517 150.04375	-26.25867 -26.25754 -26.25630 -26.25762	
	W005	Guluguba Rail Siding	Three sets of rail tracks on east side of an elevated platform formed of three vertical cement slabs with horizontal timber edging and an associated concrete lined weighbridge. Scattered rail spikes. No standing structures remain.	150.04551	-26.25702	
	W006	Station Master's House	Complex comprising homestead and three sheds (two more recent), outhouse, chicken house and holding yard. Dam and windmill lie to immediate north of fenced off complex.	150.04394	-26.25559	
	W008	Leichhardt Memorial	The remnants of a tree that is said once bore the initials of Ludwig Leichhardt. The tree is weathered and burnt and now comprises only a partial shell of the original trunk approximately 70 centimetres high. Within the shell is a cement plinth with a plaque marked 'Leichhardt 1844 camped & carved his initials on a tree which stood on this exact spot'. The letters LL are etched into the cement.	150.03975	-26.26163	
	W012	Guluguba House	Roughly square house perched on top of hill above and to the northwest of Guluguba. Stumped with hipped roofed centre and skillion annexes at front and rear. Open central verandah at front. Central foyer through centre of house. Clad in tongue and groove and corrugated iron.	150.03954	-26.25498	
	W014	Guluguba Dairy and Meat House	Eight bay dairy shed clad with corrugated iron. Rectangular shape with iron skillion roof. Two small corrugated iron clad sheds on north side of dairy. Rear of dairy faces railway line. Small meat house located on northeast side of dairy. Site is approximately 35 m x 45 m.	150.03930	-26.25355	

Appendix C: EHS11

Santos EHSMS

EHS11 Cultural Heritage

Environmental Hazard Standard

Santos Ltd
60 Flinders Street
Adelaide
South Australia
5000

Revision 7
August, 2013

EHS11 Cultural Heritage

Santos

Contents

1 Background

1.1 Purpose

Aboriginal and non-Aboriginal Cultural Heritage is protected by legislation in all Australian states and territories and can be encountered in all areas of Santos onshore Australian operations. There are also specific obligations to report identified Cultural Heritage sites to statutory authorities, and where required, to Aboriginal stakeholder representatives.

At Santos the protection of non-Indigenous and Indigenous cultural heritage is managed using the EHS 11 Cultural Heritage Standard.

All Santos personnel and contractors are responsible for understanding what they must do to comply with cultural heritage obligations.

This standard establishes a Cultural Heritage management system that manages risk, and ensures compliance with all legislative requirements related to Santos' Australian operations, and compliance with agreements with Aboriginal stakeholders, in a manner that is comprehensive, documented and auditable.

Cultural Heritage includes both Aboriginal and non-Aboriginal areas, sites, objects and places:

- Non-Aboriginal Cultural Heritage includes sites, artefacts and objects that, with written documents, help contribute to our understanding of Australia's recent history;
- Aboriginal Cultural Heritage includes sacred sites, significant sites, areas, sites, objects and places which document Aboriginal habitation of the country. These include physical traces left by Aboriginal people (such as rock art, stone arrangements and stone tools) but may also include places or features in the landscape that bear no traces of human activity.

Cultural Heritage legislation in Australia places a responsibility on Santos to consider the impacts of activities on Cultural Heritage sites, places or objects, and to take reasonable measures to avoid harm. These responsibilities are also embedded in binding agreements between Santos, statutory authorities and Aboriginal stakeholders.

Aboriginal Cultural Heritage legislation requires engagement with relevant Aboriginal stakeholders for certain activities.

Additionally, in cases where activities will impact on Cultural Heritage, a statutory approval may be required.

The risk to Cultural Heritage from Santos operations comes from a number of primary sources:

- Not following established and mandatory processes for preventing harm to, and protecting, Cultural Heritage.
- All ground-breaking, ground-disturbance, excavation activity and project works (Category A and B in accordance with HSHS19 Excavations).
- Any off-road vehicle traffic (in accordance with HSHS02 Land Transportation).
- Any travel by vehicle or on foot that is unauthorised and where there is not express approval for access. This is particularly important in the Northern Territory.
- Moving, touching or interfering with sites.
- When operating in areas known to be of high cultural value, such as in sand dunes, lakes, rivers and clay pans, floodplain, gibber country, rock outcrops, caves and coastal dunes.

1.2 Scope

This standard applies to all Australian onshore operations and offshore drilling in Australian waters.

1.3 Key Operational Requirements

- All Santos activities must be undertaken in a manner that avoids impact to Cultural Heritage.

- Where such impacts are unavoidable, all statutory and other approvals must be obtained before the activity commences. A decision on unavoidable impact can only be made by the Cultural Heritage Team, and where required, is made in consultation with Aboriginal stakeholders and statutory authorities.
- Statutory reporting of Cultural Heritage sites must be undertaken in accordance with legislative requirements for each state and territory and for the Commonwealth and in accordance with agreements with Aboriginal stakeholders.
- Site and role-specific Cultural Heritage induction must be completed by relevant personnel.
- Activity must immediately stop where there is potential for Cultural Heritage harm, where there has been impact to Cultural Heritage or where there is discovery of Cultural Heritage during operating activity – even if clearance approval has previously been given. Where the activity has potential to impact, or has impacted Cultural Heritage, immediately contact the Cultural Heritage Team.

1.4 Behavioural Requirements

For the mandatory requirements listed in this Cultural Heritage Standard to be effective, there are critical behaviours and actions required of Santos and contractor personnel. These behaviours are divided into 3 areas of responsibility:

- **All Personnel** must undertake Cultural Heritage induction relevant to their level of risk and use the standards, procedures and rules that apply to them.
- **Supervisors and/or activity managers** must visit the worksite regularly to check conformance with the standards and ensure their team has the skills, experience and competence to complete their activities without risk to Cultural Heritage.
- **Managers** must demonstrate, through their actions, their commitment to a safe workplace. They must regularly explain safety expectations and ensure that their personnel understand and conform with this Cultural Heritage Standard.

2 EHS11 Cultural Heritage

This Standard describes the controls associated with the management of Cultural Heritage and consists of the following four elements:

Element 1: Cultural Heritage clearances

Element 2: Cultural Heritage discovery site management procedures

Element 3: Cultural Heritage Induction

Element 4: Supporting systems and procedures

3 Standard Requirements

3.1 Cultural Heritage Clearances

Cultural heritage clearances are the primary control for risk to cultural heritage and sacred or significant sites arising from ground-breaking, ground-disturbance, excavations or project works. Cultural heritage clearances are explained in greater detail at Appendix B How to complete a Request for Cultural Heritage Clearance Form (RFCHC form).

Mandatory Requirements

a) Approved Cultural Heritage clearances shall be obtained for any activity with potential to impact Cultural Heritage using a Request for Cultural Heritage Clearance form (RFCHC form).

- Clearances shall be approved using a Request for Cultural Heritage Clearance form prior to commencement of activity

Guidance

For Santos in the Northern Territory an approved RFCHC form is required for all ground-breaking, ground-disturbance, excavation activity or project works. This includes new activity and also variation/modification or expansion of existing project works whether or not there is ground breaking, disturbance activity or prior land use.

It includes submission of RFCHC for:

- geological, geochemical and geophysical surveys;
- drilling activities;
- the continued development, construction, establishment and operation of petroleum production facilities;
- the construction and use of roads (including borrow pits) airstrips, pipelines and other transportation and access systems; and
- continued development and operation of living quarters and ancillary facilities.

For GLNG an approved RFCHC form is required for all ground-breaking, ground-disturbance or excavation activity with the potential to impact Cultural Heritage.

It includes submission of a RFCHC for:

- all ground-breaking, ground-disturbance or excavation activity outside an existing infrastructure footprint (camp site, compressor station, evaporation pond, flowline easement, plant site, lease etc.);
- any ground-breaking, ground-disturbance or excavation activity in previously undisturbed areas;
- expansion of any prior ground-breaking, ground-disturbance or excavation activity (expanding lease pads, realigning or upgrading access tracks, expanding existing borrow pits/flare pits and similar activities);
- ground-breaking, ground-disturbance or excavation activity in areas subject to other forms of land use (non-petroleum activities e.g. pastoral or agricultural activities); and
- operation or transport of heavy machinery off existing road networks, access tracks and turn-arounds including existing access tracks that may require additional works.

For the Cooper Basin only, an approved Request for Cultural Heritage Clearance form is required for:

- all ground-breaking, ground-disturbance or excavation activity outside an existing "petroleum infrastructure footprint" (camp site, compressor station, evaporation pond, flowline easement, plant site, lease etc.);
- any ground-breaking, ground-disturbance or excavation activity in previously undisturbed areas;
- expansion of any prior ground-breaking, ground-disturbance or excavation activity (expanding lease pads, realigning or upgrading access tracks, expanding existing borrow pits/flare pits and similar activities);
- ground-breaking, ground-disturbance or excavation activity in areas subject to other forms of land use (non-petroleum activities e.g. pastoral or agricultural activities); and
- operation or transport of heavy machinery off existing road networks, access tracks and turn-arounds.

For the Cooper Basin only, activities that *do not* require an approved Request for Cultural Heritage Clearance Form include:

- excavation of borrow pits within *existing* disturbance area(s);
- repair *and maintenance of existing* road networks and access tracks within *existing* disturbance area;
- any excavation within an *existing* "petroleum infrastructure footprint" (camp site, compressor station, evaporation pond, flowline easement, plant site, lease etc.); and
- approved off-road travel for surveys and field scouts (NOTE: any personnel undertaking approved off-road travel must have undertaken Cultural Heritage Induction, that is risk and role specific, in accordance with Appendix E Cultural Heritage Induction) and within 36 months immediately prior to any activity.

For Santos in NSW an approved RFCHC form is required for all exploration and site selection as well as ground-breaking, ground-disturbance and excavation activities or project works. This is before any activity, including new activity, and changes to any existing project work regardless of the disturbance.

It includes submission of RFCHC for:

- scouting as part of site selection;
- geological, geotechnical and geophysical surveys;
- drilling activities;
- ground-breaking, ground-disturbance or excavation activities in areas subject to any form of land use (for example, pastoral or biodiversity management activities); and
- the development, construction, establishment and operation of petroleum production facilities.

For advice on other projects and areas of operation, make contact with the EABU Cultural Heritage Team for advice or referral.

Mandatory Requirements

a) Activities requiring approved Cultural Heritage clearance shall not proceed without an approved Request for Cultural Heritage Clearance form.

b) Cultural Heritage Clearance Forms shall be submitted a minimum of 28 days prior to commencement of work but this differs slightly for each CHMP or CHMA agreement and business unit. Be aware for the Northern Territory and New South Wales this minimum period could be up to, or more than, six months.

Guidance

- Site preparation and access prerequisites may apply in some circumstances.

  For further guidance refer to Appendix B How to complete a Request for Cultural Heritage Clearance Form.

3.2 Cultural Heritage Discovery Site Management Procedures

Cultural Heritage site management is a primary control mechanism for avoiding damage to identified Cultural Heritage sites throughout the life-cycle of Santos projects and ensuring that reporting obligations to Aboriginal stakeholders and statutory authorities are met.

Mandatory Requirements

a) Cultural Heritage sites identified during the conduct of Santos activities shall be recorded using the Cultural Heritage Discovery form.

b) Details of all reportable sites shall be provided to the relevant authorities in accordance with State and Commonwealth heritage legislation and with agreements.

c) An EHS compliance toolbox action must be raised for any reportable sites. Refer to Appendix D Compliance Actions.

Guidance

- Guidance on assessing whether a site is reportable, and also how to submit a Cultural Heritage Discovery form is provided in Appendix C Cultural Heritage Discovery Site Management
- Further detail is also provided in the Procedure for Management of Cultural Heritage Sites: A Handbook for Personnel and Contractors

3.3 Cultural Heritage Induction

Santos Cultural Heritage Induction provides a comprehensive framework of training and development that manages risk to Cultural Heritage and ensures all legal obligations are met.

The training also provides an opportunity for all employees and contractors to enhance their awareness and understanding of Aboriginal people and Cultural Heritage in Santos' areas of operation.

Mandatory Requirements

a) Santos personnel shall undertake appropriate site and role-specific Cultural Heritage training as determined by the relative risk of their activity to Cultural Heritage.

b) A register of Cultural Heritage Induction attendance for employees and contractors shall be maintained .

c) Any Santos employees and contractors undertaking approved off-road travel shall have undertaken risk and role specific Cultural Heritage training within 36 months immediately prior to any activity.

Guidance

- Further guidance on Induction is provided in Appendix E Cultural Heritage Induction
- Further detail is also provided in the Santos Cultural Heritage Site

3.4 Supporting Systems and Procedures

There are established systems and procedures in place to support the Santos Cultural Heritage Management System. For clearances and discoveries, the Cultural Heritage Team will review legislation and agreements to assess appropriate actions. The accuracy of information to inform their assessments is critical.

Mandatory Requirements

a) Identification of reportable sites, exclusion zones, human remains or non-routine conditional clearances shall be raised as an action in the EHS Toolbox.

Guidance

- Further detail on the reporting of compliance actions is provided in Appendix D Compliance Actions

Mandatory Requirements

b) All Cultural Heritage clearance and compliance information shall be held and maintained in electronic form on the Business Unit Cultural Heritage Teamsite.

c) All approved Cultural Heritage clearances, Cultural Heritage sites and exclusion zones shall be recorded in the Santos GIS.

d) All records shall be assigned a unique identifier to enable cross-referencing between the Cultural Heritage Teamsite and GIS.

Guidance

- All documentation and correspondence relating to Aboriginal sites, objects, remains and traditions should be endorsed with the following words.

> "Confidential: This document contains information relating to Aboriginal sites, objects, remains or traditions, and must be kept confidential. Disclosure of this information may be a criminal offence and may also offend Aboriginal tradition."

- Further guidance can be found in
  - Appendix B How to complete a Request for Cultural Heritage Clearance Form
  - Appendix C Cultural Heritage Discovery Site Management
  - *Santos Cultural Heritage Site Management Handbook*

3.4.1 Negotiation of Cultural Heritage Management Plans

Mandatory Requirements

e) As a legislative requirement, or where practical, Cultural Heritage Management Plans (CHMPs/CHMAs) may need to be negotiated with the relevant Aboriginal stakeholders .

f) All Cultural Heritage Management Plans must be negotiated under an Authority to Negotiate (ATN) approved by the relevant Business Unit.

Guidance

- Further guidance can be found in
  - Aboriginal Engagement Policy
  - Appendix F Negotiation of Cultural Heritage Management Plans

4 Responsibilities

Refer to EHSMS Responsibilities for a listing of responsibilities by position type.

5 Appendices & Auditor Guide

Document	Name
Appendix A	Request for Cultural Heritage Clearance Guideline
Appendix B	How to complete a Request for Cultural Heritage Clearance Form
Appendix C	Cultural Heritage Discovery Site Management
Appendix D	Compliance Actions
Appendix E	Cultural Heritage Induction
Appendix F	Negotiation of Cultural Heritage Management Plans (CHMPs, CHMAs)

6 Linkages & Forms

Document	Name
EABU Team Site	EABU Cultural Heritage Team Site
EABU Forms	Request for Cultural Heritage Clearance Form (RFCHC form) Cultural Heritage Discovery form (CHD form)
GLNG Team Site	GLNG Cultural Heritage Team Site
GLNG Forms	GLNG Request for Cultural Heritage Clearance Form (RFCHC form) GLNG Cultural Heritage Discovery form (CHD form)

7 Supporting Documentation

Document	Name
Policy	Aboriginal Engagement Policy
Handbook	Procedure for Management of Cultural Heritage Sites: A Handbook for Personnel and Contractors
Handbook	*Santos Cultural Heritage Management System Handbook* (SCHMS Handbook) Cultural Heritage Team use only

8 Definitions & Acronyms

Refer to the EHSMS Definitions and Acronyms for a full list of terms used in this Standard.

9 User Feedback & Document Control

Users of the Standard are encouraged to report any mistakes or confusing information, or to provide suggestions for improvement by contacting the EHSMS Coordinator.

The Standard Custodian manages document control of the EHSMS. The controlled copy of this standard is located on the EHSMS topics page on the Santos intranet. Users of a printed copy of the standard are responsible for ensuring they have the current version. This can be achieved by ensuring the revision number in the footer of each page of the printed copy is the same as the revision number displayed against the standard on the Santos intranet.

This Standard will be reviewed by the Standard Custodian and Technical sponsor at a minimum on a three yearly basis.

10 Document Control

10.1 Document Status

Revision: 5	Technical Sponsor: Kerrynne Liddle	
Action	**Name & Position**	**Date**
Prepared By	Jon Bok, Aboriginal Engagement Team Leader (Conventional)	6 May 2011
Reviewed By	Cultural Heritage Team, Site Managers	June, 2011
Approved By	Jon Bok, Aboriginal Engagement Team Leader	29 July 2011
Reviewed	Heidi Vavasour, EABU Cultural Heritage Team Leader Kim Barber, GLNG General Manager, Sustainability Kerrynne Liddle, Manager, Aboriginal Participation	20 Aug 2013
Document Review Schedule:	This document is due for review on 27-Aug -2016 (minimum every three years)	

10.2 Document Amendment Record

Revision	Date	Prepared by	Change description
1	13/12/2005	John Sargaison	New Standard
2	09/01/2006	John Sargaison	Included activities in definitions to clarify requirements when CHMP is required/not required, preparation of CHMP, Implementation of Indigenous agreement (Cultural Heritage management plan field operations document), selection of relevant monitors

3	10/05/2007	John Sargaison	Replaced appendices B & C and removed D & A number of additional changes in requirements
4	19/05/2009	Jon Bok	Renamed Standard from 'Indigenous Cultural Heritage Management" to "Cultural Heritage Management". Significant content changes
5	15/05/2011	Jon Bok	Significant re-write to simplify requirements. Suite of new appendices and forms added for guidance
6	01/07/2012	Kerrynne Liddle and Heidi Vavasour	Amended to reflect language consistency with Cultural Heritage induction tools (Powerpoint and updated Procedure for the Management of Cultural Heritage Sites: A Handbook for Personnel and Contractors). Also removal of redundant information and addition of new information as appropriate.
7	27/08/2013	Kerrynne Liddle and Heidi Vavasour	Amended to include Northern Territory and New South Wales operations and new projects and locations