11. Aboriginal and Historic Heritage

TNG commissioned Australian Museum Consulting (AM Consulting) to prepare an Aboriginal and Historic Heritage Assessment for the Project. This report is presented in Appendix K and has been prepared in accordance with the principles of the *Burra Charter; The Australia ICOMOS charter for the conservation of places of cultural significance 2013* and in accordance with current heritage best-practice guidelines as identified in the Department of Lands, Planning and the Environment Heritage Branch's *Scope of Works for an Archaeological Survey* and associated supplementary publications.

11.1 Statutory Context

The conservation and management of heritage items, places, and archaeological sites takes place within the framework of relevant Commonwealth and Territory legislation. Non-statutory heritage lists and registers, ethical charters, conservation policies, and community attitudes and expectations can also have an impact on the management, use, and development of heritage items. The following describes the relevant legislation, and statutory and non-statutory heritage listis for the study area.

Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act provides a legal framework for the protection and management of places of national environmental significance. Several heritage lists are addressed by the EPBC Act, including the National Heritage List (protects places that have outstanding value to the nation) and the Commonwealth Heritage List (protects items and places owned or managed by Commonwealth agencies). The Minister's approval is required for controlled actions which would have a significant impact on items and places included on either of these lists.

There are no Aboriginal or historic heritage items, places or archaeological sites listed on the National or Commonwealth Heritage Lists within or near the Project area.

Aboriginal and Torres Strait Islander Heritage Protection Act 1984

The purpose of this Act is to preserve and protect areas and objects in Australia and in Australian waters, that are of particular significance to Indigenous people in accordance with their traditions. The Act allows the Minister for the Environment to make a declaration protecting significant Indigenous areas or objects, including human remains, from 'threat of injury or desecration'. The Act does not protect all forms of Indigenous heritage; for example, it does not cover areas and objects whose heritage significance is due to their archaeological, scientific or historical interest (DotE 2014).

There are no areas or objects near to the Project area that are the subject of a declaration under this Act.

Native Title Act 1993

Native title is the recognition by Australian law that Aboriginal peoples or Torres Strait Islanders have rights and interests to land and waters that arise from traditional laws and customs. The Native Title Act recognises and protects native title in Australia, and establishes a mechanism for determining native title claims. It also provides for negotiations between native title holders or registered native title claimants and other parties regarding the use and management of land and waters, in the form of Indigenous Land Use Agreements (ILUAs).

The Native Title Registrar of the National Native Title Tribunal (NNTT) keeps three public registers of native title information: the National Native Title Register, the Register of Native Title Claims, and the Register of Indigenous Land Use Agreements. Registered native title holders are recognised as having a right to speak for Country on Aboriginal culture and heritage.

There are no ILUAs or Aboriginal places listed on the National Native Title Register near the study area. The mining area and part of the access road is covered by one native title determination application that has met the requirements for registration on the Register of Native Title Claims: the Stirling and Neutral Junction (NNTT Application Reference DC2011/002).

Aboriginal Land Rights (Northern Territory) Act 1976

The Aboriginal Land Rights (Northern Territory) Act (ALR (NT) Act) provides the basis upon which Aboriginal people in the Northern Territory can claim rights to land based on traditional occupation. The Act provides for the creation of at least two Aboriginal Land Councils (there are four Land Councils, with the Central Land Council being relevant to this Project) to administer certain areas of land in the Northern Territory and for the creation of Aboriginal Land Trusts to hold freehold title land and land granted by way of a successful land claim. The Act contains provisions setting out the terms and conditions upon which mineral exploration licences, mining interests and other leases and interests can be granted over land held by an Aboriginal Land Trust. The Act also controls entry onto Aboriginal Land and prohibits a person (other than an entitled Aboriginal person or group) from entering onto or remaining on Aboriginal land without a permit. The Central Land Council (CLC) can issue a Sacred Site Clearance Certificate (SSCC) to prevent damage to, and interference with, Aboriginal sacred sites. The certificate achieves this by setting out conditions in relation to entering and working on the subject land. An applicant, when applying for a certificate, agrees to be bound by the conditions of the certificate. A SSCC not only protects the applicant against prosecution for entering, damaging, or interfering with sacred sites under the ALR (NT) Act, but also the *Northern Territory Aboriginal Sacred Sites Act 1989*. It achieves this by providing the applicant with documentary evidence that the custodians and traditional owners of the subject land have been consulted and consent to the applicant's proposed works.

TNG submitted an application to the CLC for a SSCC for the Project. A certificate (SSCC2015-034) covering the mine, camp, transport corridor and rail siding was issued by the CLC on 30 June 2015. The certificate identifies Sacred Site Exclusion Zones and Restricted Work Areas. TNG will comply with the conditions set in the approval. TNG also received a certificate (SSCC 2015-169) on 29 January 2016 covering the water pipeline and borefield. The borefield clearance allows for a 100 m wide corridor by 20 km long for the pipeline following existing station tracks from the mine site past Boko bore to Browns bore/yards, thence a 1000 m wide zone to the north covering the borefield and going from west of the existing station track (from Browns to Wollagalong bores) to the Hanson River.

Northern Territory Heritage Act 2011

Under the provisions of the Northern Territory Heritage Act (Heritage Act), the Minister for Lands and Planning is responsible for the care, control, management and protection of natural and cultural heritage places, items, buildings, works, relics, moveable objects, precincts and archaeological sites throughout the NT. The Heritage Council is responsible for assessing the heritage significance of places and making recommendations to the Minister. All Aboriginal or Macassan archaeological places and objects are automatically protected under the Heritage Act regardless of their significance or land tenure. Aboriginal objects and places can include pre-contact features such as scarred trees, rockshelters and open camp sites, as well as physical evidence of post-contact use of the area such as Aboriginal reserves and pastoral stations. Other places can be declared by the Minister as a heritage places if they meet the criteria for listing and have historical, scientific, aesthetic or social significance.

There are no Aboriginal or historic heritage items or places listed on the NT Heritage Register in or near the Project area. A limited number of identified Aboriginal and historic sites were registered in the NT Aboriginal and Macassan Archaeological Places Database (three Aboriginal artefact scatter sites). According to the Heritage Branch of the Department of Lands, Planning and the Environment, this limited number is reflective of a lack of archaeological investigation, rather than an absence of archaeological sites (D. Bensley pers. comm. July 2015). Three Aboriginal artefact scatter sites have been previously identified in the survey area, located on relatively flat sandy plains in close proximity to ephemeral creeks (Smith 1997). These results correlate with the body of archaeological and academic research in the broader central desert region, where people tended to camp more frequently in close proximity to water, resources or vantage points (Napton & Greathouse 1985; Smith 1988, 2005, 2006).

Northern Territory Aboriginal Sacred Sites Act 1989

This Act provides protection for Aboriginal sacred sites throughout the NT. Sacred sites are defined as sites that are 'sacred to Aboriginals, or otherwise of significance to Aboriginals according to Aboriginal tradition'. Aboriginal sacred sites are declared by the Aboriginal Areas Protection Authority (AAPA). It is an offence for a person to enter or remain on, carry out work on or use, or desecrate a Sacred Site without the prior issue of an Authority Certificate. The Authority Certificates set out the conditions on which work may be carried out or the land used, according to Aboriginal custodians' wishes.

A search of the Register of Sacred Sites by TNG identified Sacred Sites that required an Authority Certificate to be issued. See the discussion the *Aboriginal Land Rights Act 1976* above for approvals granted.

11.2 Survey Method

11.2.1 Desktop Assessment

The key heritage requirements for this assessment were:

- identify any previously recorded Aboriginal sites or landscape features that indicate the presence of Aboriginal objects likely to be impacted by the Project;
- identify any previously recorded historic heritage items, places or archaeological sites or features that indicate the presence of historical archaeological sites likely to be impacted by the Project; and
- identify any constraints and heritage impacts arising from the presence of known or potential built heritage, archaeological or Aboriginal sites.

To fulfil the requirements of the assessment, the following tasks were undertaken:

- search and review of the AAPA Register of Sacred Sites, as well as the Heritage Branch's Heritage Register databases, to determine the location and nature of any Aboriginal or historic sites recorded within or near the Project area;
- review of relevant statutory and non-statutory Commonwealth and NT registers and lists;
- review of relevant previous archaeological and heritage consultancy reports, to determine the extent of past archaeological research in the local area; and
- review the environmental and Aboriginal heritage context of the Mount Peake area, and development of a predictive model for Aboriginal heritage for the local region, based on the current understanding of Aboriginal heritage and archaeology.

11.2.2 Field Survey

An archaeological survey of the Project area was undertaken in June 2015 by AM Consulting. This targeted survey investigated potential historic and Aboriginal heritage sites within areas of high or moderate archaeological potential in the study area, to establish their extent and current condition. The field survey targeted landforms and environments across the Project area, based on the predictive modelling. The purpose of the survey was to:

- inspect a large proportion of the Project area through targeted pedestrian and vehicular survey;
- identify the location and extent of the previously identified artefact scatter sites;
- record any Aboriginal or historic archaeological sites identified during the survey; and
- identify any areas of potential Aboriginal or historic heritage sensitivity, and determine the likelihood of Aboriginal archaeological sites occurring within the proposed Project area.

Where Aboriginal artefacts were encountered, notes were taken regarding their type, size and material, a description of the site and GPS coordinates.

11.2.3 Consultation

AM Consulting contacted the Central Land Council (CLC) to facilitate engagement and participation with the local Aboriginal community for the archaeological survey. Unfortunately, due to an unexpected death in the community immediately prior to the scheduled survey, the CLC was unable to contact the appropriate community members, and AM Consulting was forced to proceed without community involvement in fieldwork. AM Consulting provided their draft report to CLC for community review and comment, with feedback incorporated in to the final report.

In addition to the work by AM Consulting, TNG in conjunction with the Central Land Council and members of the local Aboriginal community undertook Aboriginal community consultation, as part of the methodology for obtaining Sacred Sites Clearance.

11.3 Environmental and Cultural Setting

11.3.1 Environmental Setting

Understanding the environmental setting of the Project area provides a context for past human occupation and history, as well as to contextualise archaeological material and feed into predictive archaeological sites modelling. Both current and historic land use have the potential to impact the identification, quality and existence of archaeological material.

The region is characterised by flat to gently undulating sandplains and is dominated by linear or longitudinal dunes and sand ridges and valleys. Vegetation patterns in arid Australia are controlled by a combination of low and highly unpredictable rainfall, soil characteristics and the local topography, though there are few areas that are not at least sparsely vegetated (Hesse *et al*. 2005; Tille 2006). The central NT desert is characterised by several major river systems that generally only flow for short periods after heavy rains (Wilson *et al.* 1990; Smith and Hesse 2005). The Hanson River, Murray Creek and Bloodwood Creek bisect the Project area, while a number of small unnamed and ephemeral creeks and channels have been formed at the foot of the Djilbari Hills and Central Mount Stuart in the west and Mount Tops and Mount Octy in the east. These drainage systems do not contain permanent water, but after heavy rains are likely to have been a source of fresh water for Aboriginal people in the past.

The Project area is predominantly held under Pastoral lease, with a small corridor of Crown Land adjacent to Stuart Highway. The Stirling Pastoral Station was established in the 1890s and a small homestead, a number of storage sheds and outbuildings, and numerous stockyards, dams and bores were constructed. The majority of the land remains unfenced for cattle grazing and has not been significantly disturbed by current land use practices. The study area is likely to retain a high degree of archaeological integrity.

11.3.2 Aboriginal History

Occupancy

Aboriginal occupation of the Australian desert is likely to have spanned at least 35,000 years. Aboriginal occupation seems to have intensified during the Late Pleistocene, and by around 30,000 BP small groups of highly mobile hunter-gatherers were using pockets of country across the interior of the continent (O'Connor *et al*. 1998; Smith 2005). Occupation of the central Australian desert appears to have intensified during the Holocene (Gould 1977). Little archaeological work has been undertaken in the central Australian desert region (Smith 2006; Thorley *et al.* 2011).

At the time of European settlement, the Aboriginal people of the central Australian desert were organised into named territorial groups. Those groups local to the study area are likely to have spoken the Anmatyerre [Anmatyerr] language (Tindale 2015 [1974]). The Forster Range marked the northern boundary between Anmatyerre and Kaitish country, while Mount Barkly and Mount Leichhardt marked the western boundary between the Anmatyerre and neighbouring Walpiri people (Spencer & Gillen 1904; Meggitt 1962). However, it should be noted that there is significant overlap between the Anmatyerre and the neighbouring Walpiri, Arrernte and Alyawarr language groups.

Utilising Natural Resources

The sandplain and scrub country of the Anmatyerre region is comparatively rich in water, animal and plant resources and natural resources, and would have been particularly attractive to Aboriginal people (Young 1987; Rea 2009). After heavy rains rock holes, soakages, springs, and creeks provided fresh water and more abundant plant foods, and often terrestrial animals were also drawn to the water. The Anmatyerre people relied on a mixed but rich economy of plant and animal resources. The types of traditional foods consumed and the methods for their procurement are described in contemporary ethnographic sources and the later oral testimony of traditional elders (Spencer & Gillen 1899 1904; Long 1971; Green 2000, 2003, 2003a; Rea 2009). The majority of these plant foods were cooked in open fires or on coals, consumed raw, or mixed with water and drunken. Plant resources were also utilised for the fabrication of tools, implements and shelters (Spencer & Gillen 1904; Green 2003; Flood 2004; Moloney 2005).

Grant Bluff and Central Mount Stuart sandstone provided limited material with which to make tools, though when overhanging it provided shelter from the elements. It was also a surface on which engraved and pigmented images were likely to be depicted, and on which ground edge implements could be shaped and sharpened. Although no engraved or pigmented art has been identified within the Project area, rock art complexes have been identified in the Amadeus Basin near Alice Springs approximately 220 km south of the study area (Edwards 1971; Ross 2005).

Maintaining Religious Traditions & Ceremonies

The passage from childhood to adulthood was marked by traditional initiation ceremonies, bringing about greater spiritual awareness, knowledge and responsibility for both men and women. Many Aboriginal places of significance are secret and sacred, however, there are a number of natural landscape features in the Anmatyerre region that have mythological importance. Anmatyerre people perceive the land as comprising more or less discrete 'countries'. Each country is associated with one or more of the *Altyerrenge* (Dreaming) Beings, and contains sites marking the scenes of their travels and activities. Some of these beings travelled widely and have sites along their tracks which span several countries, or are limited to a single country. These Beings reside in significant landscape features such the Hanson River (*Mer Petyal*), Central Mount Stuart (*Amakweng*), waterholes, rock outcrops and other mountain peaks (Green 2003a; Rea 2009). The travels and activities of the *Altyerrenge* beings are recorded in stories and songs and are depicted in ceremonies. Honey Ant (*Yerrampe*) and Native Cat (*Malpwenke*) Beings camped at several sites as they travelled across Anmatyerre country (Office of the Aboriginal Land Commissioner 1987).

Aboriginal Heritage Site Predictive Modelling

Although limited (see discussion in Section 11.1 Northern Territory Heritage Act), based on the archaeological sites registered in the region and review of previous studies, AM Consulting concluded that the potential presence and location of Aboriginal heritage sites within the landscape of the study area are as follows:

- open artefact sites are likely to appear as surface scatters of stone artefacts, in areas where vegetation is limited and ground surface visibility increases. Such scatters may become exposed by erosion, pastoral activity and the creation of informal, unsealed access tracks. There is potential for artefact scatters to be found in all environmental contexts and landforms, although larger and denser sites are predominantly located on the riverbanks and lower slopes facing watercourses, and on elevated ridgelines;
- flat, open areas associated with the creeks and their resource-rich surrounds would have offered ideal camping areas to the Aboriginal inhabitants of the local area. Isolated artefacts may represent a single item discard event, or be the result of limited stone knapping activity. Isolated artefacts are also likely to be located on landforms associated with past Aboriginal activities, such as ridgelines and valley floors that would have provided ease of movement through the area;
- culturally modified trees may be present throughout the study area, in areas where remnant old growth vegetation survives;
- where exposed rock surfaces and shelters occur in Grant Bluff and Central Mount Stuart sandstone geology, pigmented and engraved art sites, as well as grinding grooves may be present; and
- discrete rock outcrops suitable for the manufacture of stone artefacts may be located within the study area, in areas of suitable geology.

11.3.3 European History

Early Exploration

The first Europeans to set foot in Anmatyerre country were members of John McDougall Stuart's exploration party, which crossed the Australian continent from its southern to northern coast in a series of expeditions between 1858 and 1862. A secondary goal of Stuart's expedition was the mapping of a navigable route for the eventual establishment of an overland telegraph line.

Early Settlement

The region's earliest settlers were principally stock drovers, enticed to the central desert in the 1870s by reports of favourable, relatively well-watered grazing land (Meggitt 1962; Young 1987; Devitt 1994; Paterson 2005). Pastoralists moved into the Northern Territory via the Gulf Country of western Queensland and via Central Australia, and by the late 1870s had claimed large tracts of land in the eastern portion of the Northern Territory, between the Overland Telegraph line and the Queensland border.

Early pastoral ventures relied heavily on the prevalence of surface waters such as waterholes, springs and small lakes, but long periods of drought in the 1880s meant competition for scarce water supplies (Young 1987; Devitt 1994). Successful pastoral ventures relied on the ability to move stock to avail distant waters and pastures. Stock was highly mobile and there was little investment in infrastructure such as fences and elaborate homesteads. Most of these enterprises were short lived, particularly on smaller runs were good water and pasture land was lacking.

The Stirling run was revived in the mid-1890s, most likely as a stocked cattle station; and encompassed land on the eastern and western sides of the Overland Telegraph, in the vicinity of the Hanson River, Mount Stirling and Mount Peake. At the turn of the century, staff from the Barrow Creek Telegraph Station took up grazing licences on the Stirling and Taylor Creeks, to supplement pasture land for the Station's stock. Severe drought in 1902-1905 forced a number of small landholders out of the area, but Stirling Station endured (Meggitt 1962). Francis Robert William Scott operated Stirling Station throughout the 1900s and 1910s, and by 1921 was a notable pastoralist with considerable experience in the region. Following Scott's death in 1923, Stirling Station changed hands a number of times. It was leased by Messrs Spencer, Turner and Harris in 1925 and was purchased by Sir Sydney Kidman and son Walter Kidman in 1928 (Northern Territory Times and Gazette, 3 November 1925; Northern Standard, 15 June 1928). In the late 1930s and early 1940s it was subleased or managed by Stan Brown, and was acquired by the McCarthy family who have managed the property for at least three generations. Today, the property encompasses an area of 7,200 square km and runs 8,000 head of cattle (pers. comm. A McCarthy June 2015).

The Stuart Highway and Alice Springs to Darwin Railway

The Stuart Highway was first established in the 1870s as a supply track for the Overland Telegraph, and essentially facilitated transportation throughout and settlement of the Northern Territory interior. The dirt track was periodically inspected and maintained in conjunction with the upkeep of the telegraph line. Staged construction of the new bitumen sealed road began at the northern end of the highway in 1941, and was completed by 1944. In the period between 1970 and 1992, further upgrades were made to the highway's alignment, built structures and drainage capacity, in order to meet National Highway Standards. This included the reconstruction of a number of bridges to meet increased loading standards, the provision of overtaking lanes and, more recently, the introduction of open speed limit zones (Department of Transport 2014).

The contract for the Alice Springs to Darwin railway was awarded to the Asia Pacific Transport Consortium in 2000. Work began in 2001 and incorporated substantial earth and drainage works, including the clearance of an approximately 100m wide corridor along the length of the track, and the construction of bridges along the Elizabeth, Adelaide, Cullen, Fergusson, Edith and Katherine Rivers. The Alice Springs to Darwin section was opened to passenger and freight traffic in 2004.

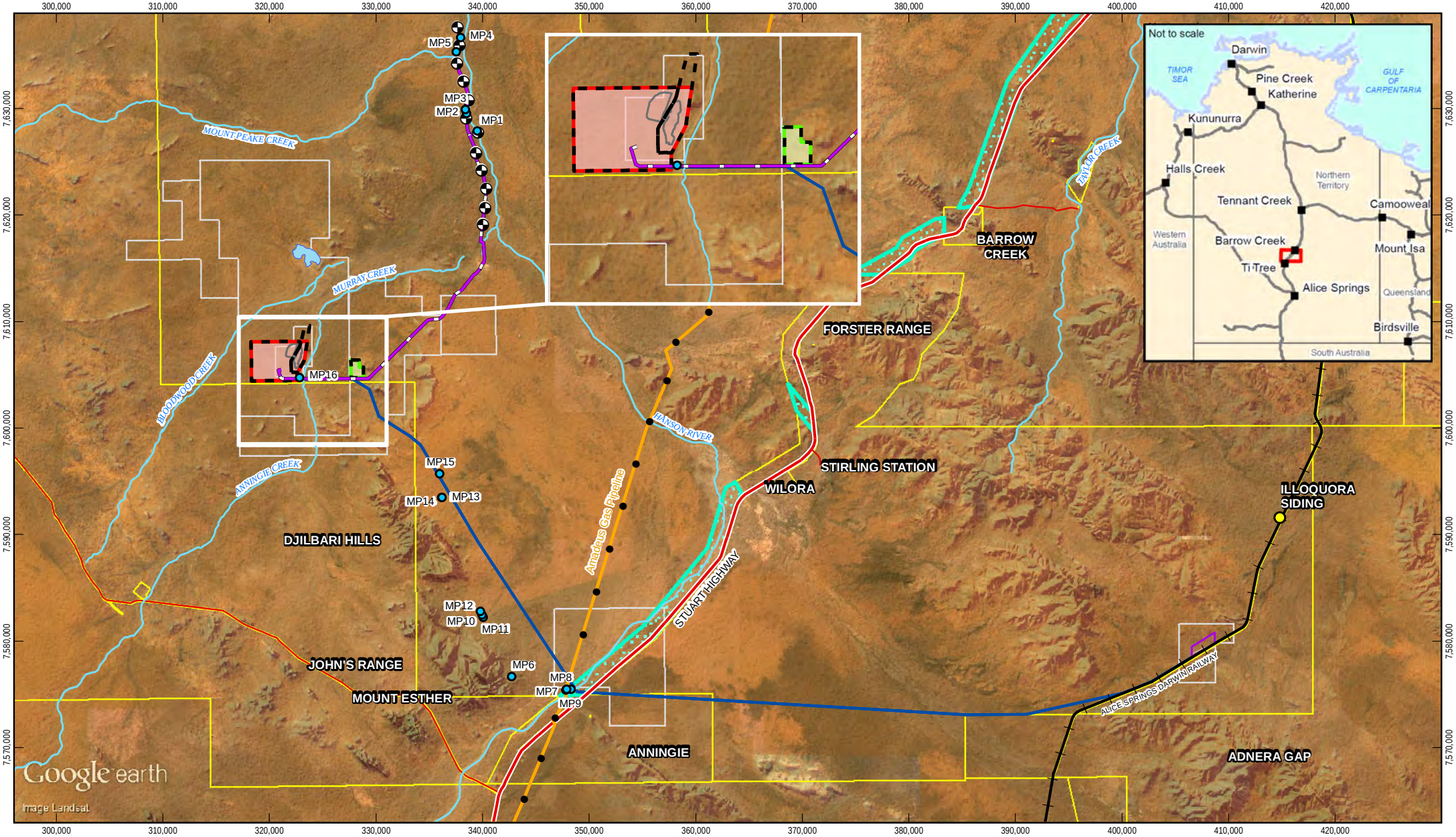
11.4 Archaeological Field Survey Results and Significance

No historic heritage structures, places or archaeological sites of known or potential significance were identified within the borefield pipeline and access road corridors nor the mine site and associated infrastructure, or their immediate vicinity, during the field survey.

Sixteen new Aboriginal heritage sites were identified within the survey area by Am Consulting. These are shown in Figure 11-1. The majority of these sites were stone tool artefact scatters or isolated stone artefacts found within 200 m of watercourses. Eight sites were identified on the lower slopes and banks of the Hanson River (MP1-MP5, MP7-MP9), one isolated artefact was found on the bank of Murray Creek (MP16), and five sites were recorded on the banks of ephemeral watercourses at the foot of Djilbari Hills and Central Mount Stuart (MP6, MP10, MP13-MP15). Two isolated artefact sites were recorded on open, flat plains more than 200 m from the nearest watercourse (MP11-MP12); though these sites are likely reflective of more fleeting occupation of the area and may represent one-off discard events by people travelling though the Djilbari Hills/Central Mount Stuart countryside. The predominant raw material employed across the study area was quartzite, quartz, and mudstone, with less frequent use of silcrete, chert and chalcedony. Flakes and scrapers made up a large portion of the assemblages identified, though cores as well as backed blades, retouched flakes and choppers/axes were observed. The characteristics of the 16 new sites Aboriginal heritage are summarised in Table 11-1. A more detailed description is provided in Appendix K.

The presence of these sites corresponds with the results of previous research in the wider region and the predictive model for the study area. The majority of identified Aboriginal heritage sites were exposed in relatively open, partially deflated contexts in close proximity to both ephemeral and significant watercourse, suggesting evidence of camping and utilisation of the resources associated with these watercourses. Wind erosion appears to be impacting a number of sites along the Hanson River, though this does not preclude the presence of sub-surface *in situ* archaeological deposits, particularly where vegetation anchors the surrounding sediment. On the basis of the archaeological survey, it is considered that relatively flat, open land in the vicinity of ephemeral and major watercourses, and significant landscape features, retain the potential for subsurface *in situ* archaeological deposits.

In contrast, no Aboriginal archaeological sites or evidence for Aboriginal occupation was observed in landscapes that lacked adequate water and stone resources and comprised featureless, densely vegetated sandplain country. This included the mine, accommodation village and Adnera loadout sites. These areas were either less frequently occupied or utilised as transitory landscapes; and are less likely to preserve archaeological evidence for Aboriginal occupation.



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Kilometres

Horizontal Datum: GDA 1994
Grid: GCS GDA 1994

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LEGEND

- Illoquora Siding
- Potential Borefield
- Borefield Delivery Pipeline
- Principal Road
- Minor Road
- Major Watercourses
- Railway
- Amadeus Gas Pipeline
- Mine Site Facilities
- Mud Hut Swamp
- Rail Siding Loading Facility
- Mount Peake Mining Area
- Crown Land
- Mount Peake Granted Tenements
- Mount Peake Mineral Leases
- Cadastral Boundaries
- Access Road
- Camp Facilities
- Archaeological Site

TNG Ltd
Mount Peake EIS

Job Number 61-29057
Revision A
Date 22 Feb 2016

Heritage Constraints

Figure 11-1

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239 Adelaide Terrace Perth WA 6004 Australia T 61 8 6222 8222 F 61 8 6222 8555 E permail@ghd.com.au W www.ghd.com.au

Data source: TNG - Gas / Slurry Pipeline Study Corridor, Camp Facilities, Borefield Infrastructure,Transport Study Corridor, Mount Peake Mining Area, Mount Peake Granted Tenements (2015). Geoscience Australia - Waterways, mainland, placename, road (2008). Google Earth Pro - Imagery (Date extracted: 13/02/2014); AMC: Archaeological Sites - 20151203; CLC: Sacred Site Exclusion Zone - 20150630. Created by: RB

Table 11-1 New Aboriginal Heritage Site Characteristics

Site ID	Location centre point (GDA 1994 MGA Zone 53)	Landform	Site Size (m^2)	Exposure	Site Description
MP1	339591E, 7627823N	Flat/ River Bank	160	Sparsely vegetated, deflated flat on western bank of Hanson River	18 stone artefacts, visible on the eroding creek bank and on the flat above. Artefacts comprised quartzite and quartz materials, including a symmetrical leaf-shaped retouched crystal quartz flake.
MP2	338594E, 7629462N	Flat/ River Bank	25	Flat, deflated clearing on the western bank of Hanson River	2 stone artefacts on the open flat area, and 3 stone artefacts deposited in a disturbed context in the bed of the river. Artefacts were manufactured of quartzite and quartz.
MP3	338498E, 7629811N	Flat/ River Bank	80	Flat, deflated open clearing on the western bank of Hanson River	12 quartzite and quartz artefacts, including a quartzite bladelet and a quartz thumbnail scraper.
MP4	338031E, 7636588N	Flat/ River Bank	20	Flat, partially deflated open clearing on the western bank of Hanson River	2 broken quartzite flakes.
MP5	337647E, 7635247N	Flat/ River Bank	44	Eroding, deflated banks of an ephemeral creek; a tributary of Hanson River	A unidirectional silcrete core with approximately 25% cortex and a mudstone thumbnail scraper.
MP6	342838E, 7576572N	Flat/Creek bank	n/a	Open, deflated flat sparsely vegetated with low spinifex grass	An isolated silcrete flake with a crushed platform and less than 25% cortex.
MP7	347906E, 7575295N	Flat/ River Bank	311	Flat, open and well deflated bank of Hanson River	32 stone artefacts predominantly manufactured of quartz, quartzite and silcrete and 2 silcrete and quartzite cores. The majority were flakes.
MP8	348415E, 7575377N	Upper Slope/ Crest	373	Sparsely vegetated, partially deflated open upper slope and crest of Hanson River	13 stone artefacts, comprised of quartz and quartzite flakes and scrapers, as well as a sandstone hammer stone with visible pitting.

Site ID	Location centre point (GDA 1994 MGA Zone 53)	Landform	Site Size (m^2)	Exposure	Site Description
MP9	347988E, 7575373N	Flat/ River Bank	200	Flat open sandplain devoid of ground cover	18 mudstone, quartzite, quartz and silcrete artefacts. The majority artefacts were flakes and scrapers, which included 2 mudstone thumbnail scrapers.
MP10	340146E, 7582138N	Lower Slope/ Creek Bank	43	Open, sparsely vegetated lower slope of southern bank of an unnamed creek	25 stone artefacts were observed on the lower slope of the creek bank. The majority were manufactured from mudstone, quartzite, silcrete and chert; one small quartz flake was recovered. This site contains 2 large silcrete and chert choppers, a blade, backed blade and bladelet.
MP11	340060E, 7582359N	Flat	n/a	Open flat sparsely vegetated with low spinifex grass	3 stone artefacts which included a quartzite scraper with unifacial retouch, a quartz thumbnail scraper and a chalcedony core.
MP12	53; 339892E, 7582673N	Flat	n/a	Open flat sparsely vegetated with low spinifex grass	1 isolated mudstone artefact. The artefact is a flake/core with less than 25% cortex, negative flake scars and bifacial retouch along its distal end.
MP13	336250E, 7593385N	Lower Slope/ Creek Bank	805	Open, sparsely vegetated and well deflated lower slope of bank of an unnamed creek	9 stone artefacts comprised both flakes and cores and were manufactured of quartzite, chert, chalcedony and quartz.
MP14	336302E, 7593373N	Lower Slope/ Creek Bank	272	Open, sparsely vegetated and well deflated lower slope of bank of an unnamed creek	10 stone artefacts. This included 3 chalcedony scrapers and a chalcedony flake, 3 quartzite flakes, a quartz scraper and flake and a mudstone flake.
MP15	336067E, 7595622N	Flat/Creek Bank	n/a	Flat, relatively open clearing on bank of an unnamed creek	1 isolated quartz stone artefact.
MP16	322940E, 7604635N	Lower Slope/ River Bank	n/a	Small exposure on the lower slopes of the western bank of Murray Creek	1 quartzite scraper.

11.4.1 Aboriginal Archaeological Potential

Results of the archaeological field survey have been used to inform an estimate of archaeological potential for landforms within the broader Project area and surrounds. For the purposes of this assessment, archaeological potential is described as the potential for selected landforms and areas to contain undetected buried archaeological deposits.

Given the relatively undisturbed nature of the region, landforms present, and the results of the predictive model and archaeological survey, the following conclusions were made by AM Consulting regarding the Aboriginal archaeological potential of the study area:

- creek and river banks within the study area have a high potential for surface Aboriginal stone artefact sites to be present, and may retain undisturbed *in situ* archaeological deposits;
- flat, open plains in the vicinity of watercourses, major landscape features such as large hills and stone resources have moderate to high potential for Aboriginal stone artefact sites to be present, and may retain undisturbed *in situ* archaeological deposits; and
- flat, featureless and densely vegetated plains of a considerable distance from watercourses, significant landscape features and stone resources have low potential to contain Aboriginal archaeological sites.

11.4.2 Aboriginal Heritage Significance

The Department of Lands, Planning and the Environment Heritage Branch has identified eight heritage assessment criteria, designed to assess and identify the heritage significance of Aboriginal sites, objects and places in the NT. These criteria are consistent with the Burra Charter guidelines for the assessment of significance. For the purposes of this assessment, Aboriginal heritage sites are considered to have heritage significance if they meet one or more of the specified criteria, as defined in the Heritage Act. The outcome of the significance assessments for the Aboriginal heritage sites associated with the Project pipeline and access road are presented below.

Borefield Pipeline

MP1 and MP3 comprise a moderate density of stone artefacts on the banks of the Hanson River and have the potential to retain intact subsurface archaeological deposits despite evidence of erosion and deflation impacts. These sites have the potential to yield information relating to stone tool manufacturing processes and the use of the Hanson River as a campsite by local Anmatyerre people. They contain artefacts of some aesthetic and technical value, including a symmetrical leaf-shaped retouched crystal quartz flake from MP1, and a quartzite bladelet and a quartz thumbnail scraper from MP3. The scatters found at MP1 and MP3 are indicative of complex archaeological deposits, are representative of past activity, and are likely to retain cultural significance, a sense of place, and heritage value for local Aboriginal people. Based on current evidence, stone artefact scatter sites MP1 and MP3 are assessed as having moderate (local) scientific (archaeological) significance and research potential and low (local) aesthetic significance.

Stone artefact scatter sites MP2, MP4-MP5 and isolated find MP16 comprise low density sites on the Hanson River and Murray Creek, and, when compared to other identified sites in the local area, have limited potential to contribute evidence of stone tool manufacturing processes and occupational patterns. They are not representative of complex archaeological deposits, and feature unretouched flakes, cores and angular fragments that are not aesthetically or technically distinctive. Based on current evidence, sites MP2, MP4-MP5 and MP16 are assessed as having low (local) scientific (archaeological) significance and research potential and no aesthetic or technical significance.

Access Road

Artefact scatter MP10 comprises a high density scatter of *in situ* stone artefacts, on the bank of an ephemeral creek at the foot of the culturally significant Central Mount Stuart. The scatter has the potential to retain intact subsurface archaeological deposits, and may yield information relating to stone tool manufacturing processes as well as the use of ephemeral creeklines as campsites by local Aboriginal people. Scatter MP10 contains two large silcrete and chert choppers, a blade, backed blade and bladelet – all artefact types which appear to be relatively rare in the local area and are of moderate aesthetic and technical value. MP10 is indicative of a complex archaeological deposit, is representative of past activity by local Aboriginal people, and is likely to retain cultural significance, a sense of place, and heritage value for local Aboriginal people. Based on current evidence, stone artefact scatter site MP10 is assessed as having high (local) scientific (archaeological) significance and research potential and moderate (local) aesthetic significance.

Stone artefact scatter sites MP7-MP9 comprise a high density scatter of in situ artefacts on the banks of the Hanson River. These scatters have the potential to retain intact subsurface archaeological deposits, and may contribute evidence for stone tool manufacturing processes, stone tool use, and the use of the Hanson River as a camp site for Aboriginal people. Sites MP7-MP9 are tentatively considered to be typical of other artefact scatters in the region featuring unretouched flakes, cores and angular fragments, and are not considered aesthetically or technically distinctive. They are, however, indicative of complex archaeological deposits, are representative of past activity by local Aboriginal people, and are likely to retain cultural significance, a sense of place, and heritage value for local Aboriginal people. On the basis of current evidence, stone artefact scatter sites MP7-MP9 are assessed as having high (local) scientific (archaeological) significance and research potential but have no aesthetic or technical significance.

11.5 Predicted Heritage Impacts

The construction and operation of the mine pit and associated infrastructure, accommodation village and rail loadout facility will not impact areas of archaeological potential. Therefore these aspects of the Project are unlikely to adversely impact surface or *in situ* Aboriginal heritage sites, objects or places. The proposed construction and operation of the borefield pipeline and access road were identified as potentially having negative impacts to Aboriginal heritage sites and *in situ* archaeological deposits which may be present.

Six Aboriginal archaeological sites were identified near to the proposed borefield pipeline alignment. Sites MP2, MP4 and MP5 are located more than 150 m from the alignment and are unlikely to be impacted by the proposed works. Depending on the ultimate disturbance footprint and design, the pipeline may result in indirect impacts to sites MP1 and MP3, and may impact on any subsurface *in situ* artefact deposits along the Hanson River bank. Similarly, installation of the pipeline in the vicinity of Murray Creek has the potential to cause impacts to any surface or *in situ* archaeological deposits along the creek banks, as well as indirect impacts to isolated find MP16.

TNG has re-aligned the borefield pipeline to avoid impact to sites MP1, MP3 and MP16.

The construction of the access road was found to directly impact MP13 and MP14, with sites MP6 and MP10 most likely indirectly impacted. Furthermore, impacts to existing surface scatters and subsurface *in situ* archaeological deposits can be expected wherever the access road crosses Murray Creek, the Hanson River and other ephemeral creeks near Djilbari Hills and Central Mount Stuart. The use of heavy machinery to install engineering solutions to reduce surface water impacts and clear native vegetation will result in disturbance to the land in the access road corridor; and this may impact on underlying *in situ* archaeological deposits in areas of archaeological potential.

TNG has re-aligned the access road to avoid impact to sites MP6, MP10, MP13 and MP14.

The construction of the access road in the vicinity of Tin Fish Well is proposed to follow the disturbed footprint of existing access tracks, located along a fence line and the existing Alice Springs to Darwin railway line. The access road is unlikely to impact on surface or *in situ* Aboriginal heritage sites, objects or places to the east of Tin Fish Well. While the previously identified Mt Tops/Mt Octy 2 and Mt Tops/Mt Octy 3 sites could not be located during the 2015 survey, both sites lie within the rail corridor and were likely destroyed or significantly disturbed by track construction. As such, the construction of the access road is unlikely to impact these previously recorded sites.

11.6 Summary of Impacts and Conclusions

No historic heritage structures, places or archaeological sites were identified during the survey. There are no known heritage constraints preventing the construction and operation of these assets and no further assessments are required.

No Aboriginal sites were identified within the footprint of the mine site, accommodation village and loadout facility during the survey.

The archaeological survey did identify sixteen previously unrecorded Aboriginal sites. The results of the survey concur with the predictive model, suggesting areas of archaeological sensitivity with potential to contain surface and subsurface Aboriginal archaeological sites are associated with natural landforms in the vicinity of watercourses, significant landscape features and natural resources. The heritage assessment determined that the proposed borefield pipeline and access road alignments were likely to impact a number of the Aboriginal sites and areas of archaeological sensitivity. Based on the results of this assessment, TNG has re-aligned the access road and borefield pipeline to avoid impacts to aboriginal sites.

Through the detailed design phase of the Project, TNG will look to avoid impacts to Aboriginal sites or areas of archaeological sensitivity. Where impacts are unavoidable, artefact recording and relocation will be undertaken to fully record the condition, extent and significance of artefact sites along the Hanson River and in the Central Mount Stuart/Djilbari Hills foothills. TNG will lodge a Works Approval Application Form with the Heritage Branch to allow further archaeological works within the Project area, including artefact recording and relocation, and archaeological excavations, in accordance with section 72 of the Heritage Act.

Sacred Site Clearance Certificate SSCC2015-034 identifies Sacred Site Exclusion Zones and Restricted Work Areas over the mine, camp, transport corridor and rail siding. TNG will comply with the conditions set in the certificate and also make all staff working on the Project aware of the statutory obligations relating to historic and Aboriginal cultural heritage. TNG has realigned a section of the access road to avoid impacting one of the Sacred Sites.

TNG will also comply with the conditions of certificate SSCC 2015-169 covering the water pipeline and borefield.