

# Wallerberdina Station National Radioactive Waste Management Facility

Aboriginal Cultural Heritage Report PUBLIC VERSION

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## **Executive summary**

The Australian Government, Department of Industry Innovation and Science (the Department) is seeking to establish a National Radioactive Waste Management Facility (the Facility), to manage low level and intermediate level waste generated in Australia. In accordance with the *National Radioactive Waste Management Act 2012*, a voluntary site nomination process is underway.

Wallerberdina Station in South Australia is one of three sites that were voluntarily nominated and currently under assessment to determine their viability to host a Facility. Wallerberdina Station was progressed to the Site Characterisation phase of the Project after the local community demonstrated support to undertake a technical and heritage assessment and continue with community consultation.

Since the inception of the Project, DIIS have prioritised Aboriginal cultural heritage by undertaking voluntary comprehensive community consultation. A Heritage Working Group (HWG) was formed with the intent to facilitate consultation between DIIS and the Adnyamathanha community. This group was formed by equal numbers of Adnyamathanha Traditional Land Association (ATLA) and the Viliwarinha Yura Aboriginal Corporation (VYAC). Members of the HWG were democratically elected to the group by ATLA and VYAC respectively, in order to speak for Country and represent the wider Adnyamathanha community.

RPS has been engaged by the Department to undertake an independent Aboriginal heritage assessment, in consultation with the HWG, to inform the Site Characterisation phase within the nominated area of Wallerberdina Station. This Aboriginal Cultural Heritage Assessment Report (ACHAR) will be supplemented by environmental technical assessments including groundwater, surface water, flood modelling, seismic and flora and fauna.

The nominated area of Wallerberdina Station is located within the Flinders Ranges region of the Australian arid zone. The Flinders Ranges are part of the Adelaide geosyncline and geological features composed of sediments deposited approximately 1,800 to 1,500 million years ago (Specht & Wood 1972: 68). The Flinders Ranges are located within Adnyamathanha Country and archaeological investigations provide evidence for occupation of the area at least 49,000 years ago (Hamm *et al* 2016).

The Study Area is defined as the nominated portion of Wallerberdina Station (see Figure 1). The Study Area is located approximately 25 kilometres northwest of the township of Hawker and approximately 21 kilometres east of Lake Torrens. Preliminary desktop constraints analyses undertaken by the Department have identified two unconstrained areas within the Study Area that will be considered for the potential location of the Facility. These areas are referred to as Project Area East and Project Area West for the purposes of this assessment.

During the preliminary stages of consultation for this assessment and following the site visit, it became evident that there were numerous sensitive Aboriginal cultural heritage sites located adjacent to and within with Project Area East. As such, the Department determined that Project Area East would no longer be considered as a potential location for the Facility. Project Area East is assessed and discussed in this report, however, the following summary of results and recommendations focus on Project Area West.

Key findings regarding Project Area West are:

- Adnyamathanha people have a strong and ongoing connection to Country and this is exemplified by the intangible and tangible heritage values associated with the Flinders Ranges.
- Access along Lake Torrens Homestead Road in and out of Wallerberdina and Project Area West is important to members of the HWG present during the site visit. Adnyamathanha people maintain hunting and gathering activities in the region and these activities are considered important in Adnyamathanha cultural and social life.



- The Department is aware of the archaeological potential of certain landforms. Further, non-invasive investigation would be required to determine if archaeological constraints exist and to make recommendations regarding avoidance or mitigation of potential impacts
- The Department is aware of the potential for culturally significant sites to occur, this would require further consultation with the Adnyamathanha community to identify

A number of Aboriginal heritage values were identified outside of Project Area West, within and surrounding the wider Study Area. Location of the proposed facility within Project Area West presents an opportunity to avoid impact to these values, which include:

- A registered song line and associated archaeological site
- Hookina Creek

Should Project Area West be selected to host the NRWMF, key opportunities exist to involve the Adnyamathanha community in all future stages of the project, providing training and employment on Country. Additional opportunities exist to record oral histories and accounts that may not have otherwise been recorded, and to involve local Adnyamathanha artists in the aesthetic design of the Facility. Consideration could be given to colours, materials, embellishments and cultural plantings that ensure the Facility is sympathetic to the local landscape and the Adnyamathanha people as Traditional Owners of the area.

## Ongoing (applicable to all phases of Project)

**Recommendation 1 - Activity within the Study Area** 

- All Department staff or Project contractors that require access to the Study Area should be escorted by a male and female member of the Adnyamathanha community for protection of Aboriginal heritage and also for the spiritual protection of staff and contractors. This measure should apply to the site selection phase and technical investigation phase. During the construction phase and / or operational phase it is likely that Adnyamathanha monitors would be more appropriate on an ad-hoc basis, this would be refined in consultation with the Adnyamathanha community.
- Access to Lake Torrens Homestead Road and the Study Area should be maintained throughout the life of the Project if the Study Area is selected as a preferred site. This is considered important for ongoing cultural practices of hunting and gathering in the Study Area and travel to and from Lake Torrens and Cotabena.
- The Adnyamathanha community should be notified prior to any works undertaken within the Study Area. Nothing should be placed into the ground or left within the Study Area without prior consultation with the Adnyamathanha community. Specific recommendations around notification periods and frequency of notifications would be made in the Aboriginal Cultural Heritage Management Plan. During the current Site Characterisation phase, the HWG as a minimum should be notified as the elected representatives of the Adnyamathanha community.
- Any ground disturbance works including drilling associated with geotechnical investigations in areas that have not be subject to comprehensive archaeological survey should be avoided. Where these works cannot be avoided the proposed areas should be subject to targeted survey conducted by a qualified archaeologist and representatives of the Adnyamathanha community.
- A buffer of 500 metres either side of major creek lines should be maintained and no activity should occur within these buffered areas.



#### **Recommendation 2 - Consultation**

- Consultation with the HWG, in accordance with the consultation methodology described in this report, should be ongoing throughout the Site Characterisation phase. If Project Area West is selected to host the NRWMF, consultation with the Adnyamathanha community should continue for the life of the Project, facilitated by a qualified heritage consultant. Consultation during the operational phase should include a schedule of regular meetings each year to inform Adnyamathanha community of project developments. These regular meetings may involve an elected body of the Adnyamathanha community to disseminate information to the wider community. The set number of meetings each year should be decided in consultation with the Adnyamathanha community, however, the HWG have indicated that they have found three scheduled meetings each year to be effective on other projects.
- Representatives of the Adnyamathanha community should be provided the opportunity to participate in all archaeological and anthropological surveys that may be conducted. It is understood that these assessments would be carried out as part of technical investigations during the Site Selection phase.
- Senior cultural knowledge holders should be consulted. These knowledge holders may be identified through broad community consultation conducted during the Site Selection Phase.
- Consultation should extend to non-Adnyamathanha members of the local community who may hold knowledge relevant to the history of the Study Area. This is in accordance with the Commonwealth Ask First: A Guide to Respecting Indigenous Heritage Places and Values.
- All DIIS staff and contractors should acknowledge and respect Sorry Business and periods were the community may be grieving. Such periods may occupy most of the local community for an extended period as people travel for a funeral and/or visit family.

#### **Recommendation 3 - Cultural awareness training**

 It is understood that DIIS provides Cultural awareness training all DIIS staff and contractors involved in the Project. This training should be ongoing throughout the life of the project and outline heritage obligations of staff and contractors under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and the State *Aboriginal Heritage Act 1988*.

#### Recommendation 4 – Aboriginal Cultural Heritage Management Plan

An Aboriginal Cultural Heritage Management Plan (ACHMP) should be compiled based on the findings
of this ACHAR. This document would provide guiding principles to manage the cultural heritage values
and potential archaeological resource during the Site Selection Phase. This document would be revised
following technical cultural heritage investigation with the intent to guide the Site Selection and
subsequent phases of the Project.

### Site selection phase

#### **Recommendation 5 – Technical investigations**

LiDAR analysis and archaeological predictive mapping prepared for this assessment has identified gradated zones of archaeological potential and sensitive landforms across the Study Area. Section 6 of this report identifies the zones of archaeological potential and sensitive landforms, and Section 10.3 of this report details management and mitigation measures for each zone. If Project Area West selected to host the NRWMF, it is recommended that the management and mitigation measures outlined in Section 10.3 are employed, in addition to:



- Comprehensive archaeological survey of the preferred Facility location should be undertaken, with representatives of the Adnyamathanha community. This archaeological assessment would build upon on the findings of this ACHAR and adhere to the Aboriginal Cultural Heritage Management Plan It is recommended that the survey team includes Adnyamathanha community members with experience in archaeological survey and site recording, as well as trainees and members of the community that are acknowledged knowledge holders.
- Technical investigations should consider cumulative impacts associated with proposed ancillary works required to support the Facility including construction and upgrade of roads, increased traffic volumes during construction and operational phases, as well as potential impacts to access to the Study Area for cultural activities.
- Technical investigations should include a detailed heritage visual impact assessment (VIA) should be undertaken to assess the potential impacts to views and vistas of areas of cultural heritage significance.

Additionally, all member of the HWG present for the site visit conducted as part of this assessment recommended that all participants in technical investigation surveys should undergo daily drug and alcohol testing.

## **Construction and operational phase**

Recommendation 6 - Design principles, views and vistas

- The overall design of the Facility should aim to minimise impacts to the surrounding views and vistas two and from the selected site. Where opportunities exist colours, embellishments and materials should be selected in consultation with the Adnyamathanha community.
- Opportunities to involve Adnyamathanha artists in the design of murals for the external portions of the Facility should be explored.
- Options for cultural plantings should be developed in consultation with the Adnyamathanha community. Where possible options should be explored to select plantings that would aid the transmission of traditional knowledge as well as encouraging native species in the area and minimising visual impacts.

#### Recommendation 7 - Adnyamathanha employment and training opportunities

Long term employment and training opportunities for the Adnyamathanha community are considered of
vital importance to the HWG if the Study Area is selected as a preferred site. DIIS should consider and
clearly outline commitments to providing education, employment and training opportunities in
association with the Facility.

#### **Recommendation 8 - Consultation**

As outlined above in the ongoing recommendations section, consultation during the operational phase should include a schedule of regular meetings each year to inform Adnyamathanha community of project developments. These regular meetings may involve an elected body of the Adnyamathanha community to disseminate information to the wider community. The set number of meetings each year should be decided in consultation with the Adnyamathanha community, however, the HWG have indicated that they have found three scheduled meetings each year to be effective on other projects.

[Note: Information in this Executive Summary has been amended or redacted where necessary to ensure confidential cultural information does not enter the public domain. Redactions include reference to individual's names. Redactions and amendments include locations and details of registered Aboriginal sites]



#### Table 1.1 Abbreviations used in this report

Acronym	Details
ACHA	Aboriginal Cultural Heritage Assessment
ACHAR	Aboriginal Cultural Heritage Assessment Report
ACHMP	Aboriginal Cultural Heritage Management Plan
АНА	Aboriginal Heritage Act
APY	Anangu Pitjantjatjara Yankunytjatjara
ATLA	Adnyamathanha Traditional Lands Association Aboriginal Corporation
CHL	Commonwealth Heritage List
DSD-AAR	Department of State Development-Aboriginal Affairs and Reconciliation
EPBC	Environment Protection and Biodiversity Conservation
GIS	Geographic Information System
GPS	Global Positioning System
HWG	Heritage Working Group
LGM	Last Glacial Maximum
Lidar	Originally a portmanteau of 'light' and 'radar', sometimes considered to stand for Light Imaging, Detection, And Ranging
MT	Maralinga Tjarutja
mya	Million years ago
NHL	National Heritage List
NNTT	National Native Title Tribunal
NRM	National Resource Management
NRWMF	National Radioactive Waste Management Facility
RARBs	Register of Recognised Aboriginal Representative Bodies
SA	South Australia
UAM	United Aboriginal Mission
UNESCO	United Nations Educational, Scientific and Cultural Organization
VYAC	Viliwarinha Yura Aboriginal Corporation
WHL	World Heritage List
уВР	Years Before Present, with 1950 considered as present



# 1 Introduction

The Australian Government, Department of Industry Innovation and Science (the Department) is seeking to establish a National Radioactive Waste Management Facility (the Facility), to manage low level and intermediate level waste generated in Australia (the Project). In accordance with the *National Radioactive Waste Management Act 2012*, a voluntary site nomination process is underway.

Wallerberdina Station in South Australia is one of three sites that were voluntarily nominated and currently under assessment to determine their viability to host a Facility. The sites were progressed to the Site Characterisation phase of the Project after the local community demonstrated support to undertake a technical and heritage assessment and continue with community consultation.

RPS has been engaged by the Department to undertake an independent Aboriginal heritage assessment, in consultation with Traditional Owners, to inform the Site Characterisation process within the nominated area of Wallerberdina Station. This Aboriginal Cultural Heritage Assessment Report (ACHAR) will be supplemented by environmental technical assessments including groundwater, surface water, flood modelling, seismic and flora and fauna.

### Preamble regarding the public version

The public version of the Wallerberdina Station Aboriginal Cultural Heritage Assessment has been produced in order to protect confidential cultural information. Data collected during the assessment was provided by members of the Adnyamathanha Aboriginal community in confidence to RPS consultants. The appropriate level of confidentiality was determined by the Adnyamathanha person(s) providing the information.

The public version has been produced in accordance with the Ask First: A Guide to Respecting Indigenous Heritage Places and Values and Engage Early: Guidance for proponents on best practice Indigenous engagement for environmental assessments under the EPBC Act (the Ask First guide). The Ask First guide specifies the need to ensure that sensitive information disclosed in the course of identifying Aboriginal heritage places and values is protected from unnecessary further disclosure.

The public version retains vital information regarding the project context, assessment methodology, key findings and recommendations, without releasing confidential Aboriginal cultural data or personal information into the public domain.

[Where redactions and /or alterations have been made in this public version, these are identified by editorial notes such as this one. Editorial notes specify what changes have been made and, wherever possible, provide further context]

## 1.1 **Project background**

## **Project phases**

The Project consists of four stages. This report along with other environmental technical assessments is part of the "Site Characterisation" phase. This phase also includes the development of a detailed business case for each site under consideration with reference to site specific design and cost estimates.

The second phase of the Project is the "Site Selection and Design" phase. This phase would see the completion of detailed environmental technical assessments for input to an Environmental Impact Statement (EIS). This phase would also include the further development of a detailed business case for the Project with final engineering and other technical design costings. A Facility Management Committee would be

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established with community representation. Community engagement would continue through this phase to develop opportunities for capacity building for local businesses and employees.

The third and fourth stages of the Project are the Construction and Operational phases.

#### Community engagement undertaken by the Department

Following a public call for nominations Wallerberdina Station was nominated as a potential site for the construction of a National Radioactive Waste Management Facility. On 29 April 2016 the responsible minister announced that Wallerberdina Station would move to phase two, the Site Characterisation phase, after strong community support after a 120-day consultation period. Sixty-five per cent of those surveyed were willing to continue to the next phase of the project.

A Heritage Working Group (HWG) was formed in consultation with the Adnyamathanha Traditional Land Association (ATLA) and the Viliwarinha Yura Aboriginal Corporation (VYAC) to facilitate discussions and consultation regarding heritage and the Aboriginal cultural heritage assessment.

The following documentation of the community engagement with the HWG held prior to the commencement of this assessment is summarised below:

Date	Activity
10 April 2017	Initial meeting between the department and the HWG in Canberra.
2 May 2017	Presentation from the Department to the Adnyamathanha Traditional Land Association (ATLA) Board.
3 June 2017	HWG meeting with the Department.
24 July 2017	HWG meeting with the Department.
22 August 2017	HWG meeting with the Department.
9 October 2017	HWG meeting with the Department.

#### Table 1.1 DIIS community engagement

In addition to engagement with the HWG additional efforts include:

- A departmental staff presence in Hawker every fortnight for community consultation
- The formation of the Barndioota Consultative Committee in November 2016 that includes Aboriginal representatives.
- The formation of an Economic Working Group on 2 September 2017. This working group also includes Aboriginal members.
- The development of flyers, brochures and factsheets that are handed to or made available to community members.
- A digital newsletter released every month containing stories and updates from the Hawker area.
- A Facebook page established in October 2016. The page currently has 305 likes and an average monthly reach of over 5000 people.
- AECOM provided a presentation about seismic testing to the Barndioota Consultative Committee and the Economic Working Group in Hawker on the 20<sup>th</sup> February 2018.

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## 1.2 Study Area definition

The Study Area is defined as the nominated portion of Wallerberdina Station (see Figure 1.1). The Study Area is located approximately 25 kilometres northwest of the township of Hawker and approximately 21 kilometres east of Lake Torrens.

Preliminary desktop constraints analyses undertaken by the Department have identified two unconstrained areas within the Study Area that will be considered for the potential location of the Facility. These areas have are referred to as Project Area East and Project Area West for the purposes of this assessment (Figure 1.1). Within these unconstrained Project Areas, three locations have been identified by Geoscience Australia as suitable for the proposed location (Figure 1.1), however, the locations identified by Geoscience Australia do not limit this study.

## **1.3 Purpose and scope of this report**

This report summarises desktop research, LiDAR survey results and landscape analysis, the results of the site visit conducted with the Heritage Working Group (HWG) and the results of consultation with the HWG conducted to date. It identifies the preliminary Aboriginal cultural heritage values identified within the Study Area based on register searches, literature review and consultation. This report provides a preliminary assessment of impacts associated with potential locations for the Facility within the Study Area and provides recommendations as to how the department might avoid, minimise or mitigate the direct and indirect impacts of the Facility on those Aboriginal cultural heritage values.

This report includes the following:

- A description of the proposed works and site selection process.
- A description of the Aboriginal community consultation undertaken.
- A discussion of the environmental context of the Study Area.
- A discussion of the Aboriginal and historical context of the Study Area.
- A summary of the archaeological context of the Study Area including a discussion of previous archaeological work in the area.
- The results of LiDAR survey.
- An archaeological predictive model.
- Development of a significance and impact assessments.
- Development of guiding management and mitigation principles.

REPORT



Figure 1.1 Location of Study Area



FIGURE 1.1: PROJECT AREA LOCATION		2,000	3,000 4,000	5,000 m	LOCATION: WALLERBERDINA STATION		Path: N:Projects/Conics_Sydney/PR138677 - Walerberdina Staton National Radioactive Waste Management/GISIMXD/ACHAR/Figure1.1_Location.mxd VERSION (PLAN BY): C. Rayner	DATUM: GDA94 PROJECTION: MGA	Zone 56
		ALE1:110,000 A	AT A4 SIZE		PURPOSE: HERITAGE Technician: claire.rayner	Date: 28-Feb-18		Data Sources: RPS, Land and Property	2015
CLIENT: DIIS JOB REF: PR138677				RPS A	USTRALIA EAST PTY LTD 255 PITT STREET, SYDN T: 02 8270 8300 www.rp	(ABN 44 140 292 76 EY 2001, NSW sgroup.com.au	2) creat mai	<b>tive</b> people king a difference	RPS



# 2 Legislative context

Legislation and heritage management guidelines relevant to Aboriginal heritage and the project are outlined in this chapter. The following overview of the legal framework is provided solely for information purposes for the client for the purpose of explaining the background to the factors relevant to cultural and heritage assessment, it should not be interpreted as legal advice. RPS will not be liable for any actions taken by any person, body or group as a result of this general overview and recommend that specific legal advice be obtained from a qualified legal practitioner prior to any action being taken.

## National Radioactive Waste Management Act 2012 (Cth)

The National Radioactive Waste Management Act 2012 (**NRWMF Act**) establishes a legislative framework for siting a National Radioactive Waste Management Facility on volunteered land. Under the Act a facility will be established to manage radioactive waste generated by Australia's medical, industrial, agriculture and research use of nuclear materials. The Act was developed in accordance with international best practice and includes provisions to ensure the selected site undergoes full environmental, heritage and other approval processes. Currently, Australia's radioactive waste is stored at more than 100 sites around Australia, many of which were not built for this purpose. It is internationally accepted that centralised radioactive waste management facilities offer substantial safety and security benefits by minimising risk of accidental loss of control of radioactive waste, thereby protecting the community and environment from any adverse effects.

The NRWM Act overrides certain State and Commonwealth laws to the extent they regulate, hinder or prevent activities which are necessary for or incidental to the site selection activities described in section 11 of the NRWM Act, provided those activities are carried out by the Commonwealth, a Commonwealth entity or its contractors, employees or agents.

Similarly, the NRWM Act also overrides certain State and Commonwealth laws to the extent they regulate, hinder or prevent activities which are necessary for or incidental to the activities set out in section 23 of the NRWM Act, including the development, operation, maintenance and decommissioning of the facility, provided those activities are carried out by the Commonwealth, a Commonwealth entity or its contractors, employees or agents.

## **Environment Protection and Biodiversity Conservation Act 1999 (Cth)**

The *Environment Protection and Biodiversity Conservation Act 1999* (**EPBC Act**) is overridden by the NRWM Act so far as it relates to site selection activities. However, the EPBC Act is not overridden in respect the development, operation, maintenance and decommissioning of the facility.

This report therefore takes the EPBC Act into account and will ultimately inform the referral, assessment and approval process for the Facility. In particular, this report has regard to the definitions of environment, heritage value and indigenous heritage values, and also the EPBC Act Policy Statement on the Definition of Environment and the Ask First: A Guide to Respecting Indigenous Heritage Places and Values and Engage Early: Guidance for proponents on best practice Indigenous engagement for environmental assessments under the EPBC Act.

## Aboriginal and Torres Strait Islander Heritage Protection Act 1984 (Cth)

The NRWM Act overrides the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (**ATSIHP Act**) for site selection activities and enables regulations to be made which would do that for development, operation, maintenance and decommissioning of the facility, however no such regulations have been made to date.



This report takes the ATSIHP Act into account, by having regard to the definitions of significant Aboriginal area, significant Aboriginal object, Aboriginal tradition and Aboriginal remains in that Act.

## Aboriginal Heritage Act 1988 (SA)

South Australian laws which relate to the issues listed in section 12 and 24 of the NRWM Act have no effect (that is, are overridden) to the extent they regulate, hinder or prevent activities which are necessary for or incidental to the site selection activities described in sections 11 of the NRWM Act or the activities described in section 23 of the NRWM Act, provided those activities are carried out by the Commonwealth/a Commonwealth entity (or its contractors, employees or agents).

This includes South Australian laws so far as they relate to the archaeological or heritage values of the land, including the significance of land, premises or objects in the traditions of Indigenous people. The *Aboriginal Heritage Act 1988* (SA) (**AHA**) is therefore affected by the override in the NRWM Act.

This report takes the AHA into account by having regard to the definitions in the AHA of Aboriginal sites, objects and remains, and the definition of traditional owners. It also utilises information contained the Register of Aboriginal Sites and Objects which is maintained as part of the South Australia State Records Central Archive (requests for information are managed by the Department of State Development-Aboriginal Affairs and Reconciliation (DSD-AAR)).

The AHA provides for Recognised Aboriginal Representative Bodies (**RARBs**) to be appointed for the purposes of the AHA. If any RARBs are appointed relevant to the Study Area that the Department has not already consulted, the Department will consult them in due course.

## The Native Title Act 1993 (Cth)

The Native Title Act 1993 (NTA) established the recognition under Australian law of the Native Title of Aboriginal and Torres Strait Islander peoples over their lands. Native Title recognises that Aboriginal and Torres Strait Islander peoples had a system of law and ownership of their lands before European settlement. Native Title differs from other legislative land rights systems in Australia as it is not a grant or right created by the Australian government or dependant on recognition by the common law to be recognised. Rather it is a pre-existing right, inherent to Indigenous peoples by virtue of their distinct identify as first owners and occupiers of the land and their continuing systems of law.

Native title has been extinguished in the Study Area (Figure 2.1). The Study Area was within the claim area for the Adnyamathanha Stage 2 Determination, which found that although the Adnyamathanha Traditional Lands Association (ATLA) holds native title in respect of areas around the Study Area, native title in the Study Area itself is extinguished and so the Study Area was excluded from the Determination.

However, given the Adnyamathanha People No.1 (Stage 1) determination borders the Study Area to the east and south and the Adnyamathanha People Native Title Claim No. 3 determination forms the western border of the Study Area (Figure 2), ATLA (being the registered native title body corporate holding native title in land surrounding the site) was consulted via the Wallerberdina Heritage Working Group (HWG).

The HWG also included representatives of the Viliwarinha Yura Aboriginal Corporation, which was established to manage traditional lands and holds an interest in the nearby Yappala pastoral station.

#### Native Title South Australia Act 1994 (SA)

The Native Title South Australia Act 1994 (NTSAA) was implemented by the South Australian Government to validate past acts and incorporate provisions to validate intermediate period acts through later amendments - Native Title (South Australia) (Validation and Confirmation) Amendment Act 2000 (SA).



#### Figure 2.1 Native Title Determinations in relation to the Study Area





# 3 Methodology

## 3.1 Aboriginal Cultural Heritage Assessment methodology

The methodology for this assessment has been developed with regard to legislative requirements and heritage best practice.

## **Desktop research**

The desktop assessment identified existing Aboriginal heritage constraints as well as potential Aboriginal heritage constraints. The desktop assessment feeds into Aboriginal cultural landscape mapping and fieldwork strategy adopted for the ACHA.

This component included the following steps:

- Identification of statutory requirements relevant to the project.
- Australian Heritage Database searches, including the World Heritage List, National Heritage List, Commonwealth Heritage List and South Australian Register of Aboriginal Sites and Objects.
- Literature review.
- Landform assessment.
- Evaluate known and potential impacts.
- Discussion and recommendations.

## Consultation

The consultation strategy adopted for this assessment has been compiled based on the requirements of the Heritage Commission Ask First guide, the EPBC Act and the *Aboriginal Heritage Act 1988* (SA).

The purpose of community consultation is to ensure that Aboriginal people play an active role in shaping the management of their cultural heritage. Aboriginal people are the primary determinants of the cultural significance of sites and places. As per the Ask First guide, cultural significance is determined in accordance with relevant Aboriginal cultural groups before decisions can be made regarding the management of places and heritage values.

Productive consultation, that benefits both project outcomes and Aboriginal stakeholders, hinges upon transparent and consistent communication regarding proposed impacts to and management of heritage values. To achieve this, written and verbal communication in this methodology was supplemented by Aboriginal community meetings.

Prior to the commencement of the ACHA investigation, the Wallerberdina Station Heritage Working Group (HWG) was established. This group consists of 10 representatives from the Adnyamathanha Traditional Lands Association (ATLA) and the Viliwarinha Yura Aboriginal Corporation (VYAC), elected by the community to represent the community's interests. Note that if the site selection process proceeds for Wallerberdina, broad community consultation would be undertaken during the technical investigation phase.

The consultation strategy for this assessment consists of three steps. The results of the consultation process are described in Section 4.



# Step 1: Meet with HWG and other relevant Aboriginal people to describe the ACHA assessment process

A meeting with the HWG was held to discuss logistics for the site visit and allow HWG members to voice concerns prior to fieldwork commencing. Face to face meetings are beneficial, in order to build rapport and introduce RPS consultants to the HWG.

Additionally, RPS consultants spent a day at the Department's facility in Hawker to provide an opportunity for local community members outside of the HWG to drop in at a time convenient to them and ask questions, discuss the ACHA process and provide cultural knowledge and input to the project if desired.

The aim of meeting with all parties was to focus on developing best practice heritage outcomes for all involved in the project. These meetings provided a forum for open dialogue between the RPS heritage team and local Aboriginal groups / individuals, discussing the proposed impacts of the project and identifying key cultural heritage values in the Study Area. This dialogue allowed for preliminary understandings of concerns regarding Aboriginal cultural heritage.

The aims of the first HWG meeting included the following:

- Provide an opportunity for RPS and the Aboriginal organisations and individuals involved to clearly
  define their roles, functions and responsibilities. Provide an opportunity for attendees to discuss
  locations of future meetings, preferred times and terms of reference etc.
- Outline critical timelines and milestones for the completion of the assessment activities and delivery of reports.
- Discuss the draft methodology for the preparation of the ACHA report. This included presenting any desktop analysis results and outlining the proposed methodology for undertaking further archaeological investigations.
- Provide an opportunity for the Aboriginal parties to identify, raise and discuss their cultural concerns, perspectives and assessment requirements. Members of the HWG and other Aboriginal people may not wish to share information with other members of the HWG and individuals. Therefore, opportunities would be provided for this information to be shared privately and to be used in an appropriate manner.
- Discuss the site visit.
- Discuss processes for mediating and resolving disputes between parties that may arise during the course of the project, guided by the HWG.

Detailed minutes of the HWG meeting were kept and the date of the meeting and names of all attendees added to the Project Consultation Log.

Notes of all drop in meetings with the wider community at the Department facility in Hawker were also kept and included in the Consultation Log.

#### Step 2: Identifying Aboriginal Heritage Places and Values

A cultural heritage site visit of the unconstrained areas of Wallerberdina Station was conducted with the HWG. Any sensitive information was noted as such and measures put in place to prevent unnecessary further disclosure. Care was taken to avoid entering gender restricted areas. Where appropriate, males and females separated during the site visit to avoid gender restricted areas.

All comments collected during fieldwork and consultation have been used to inform the findings and recommendations of this ACHAR, with regard given to culturally sensitive information as needed. The full ACHAR is the result of Steps 1 and 2.



#### **Step 3: Develop Recommendations**

This ACHAR will be provided to all members of the HWG. An appropriate review period will be given to all parties.

At the end of this review period a HWG meeting will be held to discuss the findings of the report and provide members of the HWG an opportunity to raise any concerns they may have about the conclusions and recommendations of the report. All parties will be made aware that they can also provide these concerns in writing or privately if they prefer not to discuss in a public forum.

Appropriate recommendations will be discussed in review of the findings of this ACHAR and the social and economic values of the project. In accordance with the Ask First guide, the precautionary approach would be applied where there are differing opinions among Aboriginal people about the importance of a place. If needed, the RPS heritage team would mediate between Aboriginal groups and, in accordance with the "Dealing with Disputes" guide (Ask First guide: 11), impartially and diplomatically seek resolutions where possible.

Management issues that may need to be discussed or resolved include but are not limited to the following:

- Implementation of cultural awareness training for non- Aboriginal people employed working with Aboriginal heritage.
- Procedures for mediation and dispute resolution.

Detailed minutes of this HWG meeting would be kept and the date of the meeting with names of all attendees included in the Project Consultation Log.

Recommendations would not be finalised until some form of form agreement has been reached between all the relevant parties.

These recommendations, as well as any preliminary management and mitigation measures put forward have been incorporated into this ACHA report. Processes would be put in place where recommendations, management and mitigation measures are reviewed and if necessary amended if circumstances change or if elements of the project change. The ACHMP will address this process in detail.

A final public version of the ACHAR has been made available to the HWG.

Please note: Consultation should be ongoing for the lifespan of the project to ensure appropriate management of Aboriginal heritage values.

#### **Management of Confidential Information**

During the consultation undertaken for this project certain cultural information provided to RPS by members of the HWG was noted to be private and confidential. Where individuals provided guidance on the use of this information RPS has followed this guidance to respect the individuals wishes and the right of the Adnyamathanha community to determine what cultural information is released into the public domain. Where cultural information has been identified as male only or female only by the individual this information has been restricted to a female only version or male only version of the report. Where information has been requested not to be shared with the general public or anyone other than RPS consultants the DIIS project team, this information has been removed from the public report.

Confidential information provided to RPS by the HWG has been reviewed by the individual who provided that information. Where adjustments or comments have been provided these have been incorporated into the final report. The public version of this report has been provided to all members of the HWG. All feedback received on the final report has been incorporated into the recommendations for this report.

RPS has been advised by ATLA HWG members that they were instructed by the ATLA board not to take part in much of the consultation for the project including the cultural heritage site visit. RPS has made efforts



to follow the proposed methodology detailed above by continuing to provide ATLA members of the HWG with opportunity to be involved in all stages of consultation, meetings in Hawker, and the cultural heritage site visit.

#### Landscape mapping and LiDAR survey

Aboriginal cultural landscape mapping is used to identify potential unlisted or registered Aboriginal sites within an area. It is compiled using data gathered during the desktop and community consultation components of the assessment. By considering existing environmental features such as soil landscapes, geology, water sources and landform disturbance with cultural knowledge it is possible to predict where Aboriginal sites may be likely to occur within the Study Area. The predictive model developed for the Study Area was formed through the consideration of a number of conditions that influence the location of Aboriginal sites in the landscape. These were applied using buffering techniques and Boolean queries. The results of the landscape analysis and Predictive Model adopted for the Study Area are described in Section 6.

#### Cultural heritage site visit

The site visit focussed on areas of high Aboriginal cultural heritage value identified based on desktop research, preliminary consultation, LiDAR data and preliminary landscape mapping. The site visit was undertaken with members of the HWG and qualified archaeologists. The purpose of the site visit was to identify key constraints and areas of cultural significance through discussions on Country with HWG representatives who have been elected to represent the wider community.

The cultural heritage site visit targeted:

- Project Areas East and West, including the three areas identified by Geoscience Australia as potential locations for the Facility.
- Areas of potential cultural heritage value identified based on desktop research, consultation, LiDAR data and landscape mapping.

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The findings of the desktop assessment, community consultation, landscape mapping and site visit have been consolidated into this ACHAR. Based on these results this report provides the following:

- A description of the proposed works and site selection process.
- A description of the Aboriginal community consultation undertaken.
- A discussion of the environmental context of the Study Area.
- A discussion of the Aboriginal and historical context of the Study Area.
- A summary of the archaeological context of the Study Area including a discussion of previous archaeological work in the area.
- The results of LiDAR survey.
- An archaeological predictive model.
- Development of significance and impact assessments.
- Development of guiding management and mitigation principles.

This ACHAR will inform the Aboriginal Cultural Heritage Management Plan (ACHMP) for Wallerberdina Station. The ACHMP will guide future activity on the property, should the site be selected for the National Radioactive Waste Management Facility.

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## 3.2 Limitations and constraints

This report presents the findings of desktop research, LiDAR survey and landscape analysis, consultation with the HWG and site visit with the HWG. This assessment is based on consultation with the HWG only. Note that if the site selection process proceeds for Wallerberdina, broad community consultation would be undertaken during the technical investigation phase.

Please note the limitations discussed in Section 3.1 – Consultation, regarding consultation and confidentiality of data.

## 3.3 Investigators and contributors

This report has been prepared by RPS Heritage Consultants. LiDAR survey was conducted by RPS geospatial specialists. GIS mapping and analysis of LiDAR results was prepared by RPS Heritage Consultants and RPS GIS geospatial specialists.

Fieldwork on Wallerberdina Station was undertaken by RPS Heritage Consultants, with mixed gendered specialists on site in order to record cultural data with gendered confidentiality.

RPS acknowledges the ongoing contribution of the members of the HWG in providing comments, cultural knowledge and amendments to this report.



## 4 Aboriginal community consultation

[Consultation data has been redacted from this section to ensure that confidential cultural and personal information does not enter the public domain. This section has been amended to present a general summary to inform the public version]

## 4.1 **Overview of consultation**

Aboriginal people are the primary determinants of the cultural significance of sites and places. As such, community consultation is the way in which an assessment of Aboriginal cultural heritage values is informed. The purpose of community consultation is to ensure that Aboriginal people play an active role in shaping the management of their cultural heritage.

Prior to the commencement of the ACHA investigation, the Wallerberdina Station Heritage Working Group (HWG) was established. This group consists of 10 representatives from the ATLA and VYAC, elected by the community to represent the community's interests. Note that if the site selection process proceeds for Wallerberdina, broad community consultation would be undertaken during the technical investigation phase.

The consultation methodology consists of three general steps:

**Step 1**: Meeting with HWG and other relevant Aboriginal people to describe the ACHAR assessment process.

Step 2: Identify Aboriginal heritage places and values.

Step 3: Develop recommendations.

### 4.2 Overview of results

See Section 3.1.2 for detail of the consultation methodology.

### Step 1

#### HWG Meeting #1

A meeting with the HWG was held in December 2017 in Hawker, S.A. The meeting was facilitated by RPS Heritage consultants.

The aim of this meeting was to provide a forum for an open dialogue between the RPS heritage team and HWG members to discuss the methodology for the ACHAR and Aboriginal community consultation. The meeting involved the introduction of HWG members and RPS heritage team and project consultants. The purpose of the meeting was to create an open dialogue for preliminary discussions of Aboriginal cultural heritage values of the Study Area and to discuss the methodology of the heritage assessment.

#### Community Open Day

A community open day was held on 11 January 2018. RPS Heritage consultants spent a day at the Department's facility in Hawker so that local community members outside of the HWG could drop in at a time convenient to them and ask questions, discuss the ACHAR assessment process and provide cultural knowledge and input to the project if desired.

#### HWG Meeting #2

A second HWG meeting was held in January 2018 in Hawker, S.A. The meeting was facilitated by RPS Heritage consultants.

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The aim of this meeting was to present the findings of the preliminary desktop assessment portion of the ACHAR to the HWG, allowing for feedback on the findings, and to plan the upcoming site visit. The meeting involved a discussion on the legislative frameworks for the project, as well as an overview of the previous archaeological and anthropological work undertaken in the region.

## Step 2

The site visit was undertaken in mid-February 2018. The purpose of the site visit was to identify key constraints and areas of cultural significance through discussions on Country with HWG representatives who have been elected to represent the wider community.

The cultural heritage site visit targeted:

- Project Areas East and West, including the three areas identified by Geoscience Australia as potential locations for the Facility.
- Areas of potential cultural heritage value identified based on desktop research, consultation, LiDAR data and landscape mapping.

Preliminary consultation with the HWG identified that was important to the HWG that fieldwork program was not rushed. As such, five days of fieldwork was allotted, in order to ensure ample time to discuss cultural heritage values and the project. All members of the HWG were invited to attend the site visit, in person during both HWG meetings and through follow up phone calls and emails.

### Step 3

Draft finding of this report were provided to the HWG for their review and comment. Any comments provided have been incorporated into the final full version of this ACHAR.

### **Consultation documentation**

A consultation log has been maintained throughout the assessment and will be appended to the full version of this report.

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## 5 Environmental and Aboriginal heritage context

## 5.1 Introduction

An understanding of the environmental context of the Study Area is important in appraising the type and availability of natural resources which would have been available and utilised by Aboriginal people in the past. This environmental context discusses the Study Area as a whole in order to build an understanding of the subject landscape. A summary of key environmental characteristics within the Study Area is outlined in Section 5.2 below.

Sections 5.3 to 5.5 detail the ethno-history, European land use history and Aboriginal archaeological context of the region and Study Area. In discussing the ethno-history of the local area, efforts have been made to adopt commonly accepted spellings of Adnyamathanha words. Where multiple spellings exist, for example *Yadliaura* versus *Jadliaura*, the commonly accepted spelling is used as confirmed by members of the HWG, in this case *Yadliaura*. Care was taken to ensure the correct spelling and forms of words and these were refined following advice reviewed in meetings and during conversations with the HWG.

The terminology used in this section has been chosen to avoid patronising and offensive language. Discussions around the Dreaming or *Muda* attempt to convey the importance of this concept in Adnyamathanha spiritual beliefs. Terms such as "stories" and "myths" are often used in reference to the Dreaming however these terms have the potential to mislead readers as to the relevance and importance of the Dreaming in Adnyamathanha lives (Marsh 2002; Tunbridge 1988: xxviii). Therefore, the terms "oral account" or "oral history" are used. Whilst efforts have been made to discuss Adnyamathanha concepts in a culturally sensitive and respectful manner there are likely to be unintended limitations and generalisations that stem from an outsider's perspective. These issues will be addressed where identified through consultation with the HWG and amended in future versions of this report.

The terms "Aboriginal people" and Adnyamathanha people have been used in the discussion of the archaeological context of the Study Area and broader region. These terms have been chosen to differentiate between broad discussions of general occupation trends of Aboriginal people in the past observed across Australia and the archaeological trends associated with Adnyamathanha people observed within the Flinders Ranges.

## 5.2 Environmental context

The Study Area is located on the western side of the northern Flinders Ranges. The Flinders Ranges are largely formed by the Adelaide geosyncline and geological features composed of sediments deposited during the late Proterozoic and Cambrian periods (approximately 1,800 to 1,500 million years ago (mya)) (Specht & Wood 1972: 68). The Flinders Rangers uplifted to their current elevation by the Late Miocene to early Pliocene (approximate 2.5mya) (Grun *et al* 2008: 923). This uplift gave rise to extensive valley fill and fan and colluvial deposits that flank the Ranges to the east and west (Grun *et al* 2008: 923).

A wide range of sedimentary rocks are observed within the Adelaide geosyncline formation including sandstone, quartzite, siltstone, phyllites, shales, slates, limestones and dolomites (Specht & Wood 1972: 68). Over time these sedimentary rocks have been compressed, buckled, fractured, uplifted and eroded forming the deep gorges, jagged ridges and enclosed syncline basins or "pounds" that characterise the Flinders Rangers (Lampert & Hughes 1988: 141). This underlying geology would provide ample raw material for stone tool production as evidenced by the ubiquity of stone artefact sites across the local region.



The majority of the Study Area is underlain by Quarternary and Holocene alluviums with a small portion of the Wilpena Formation located in the eastern portion (Priess & Reid 1999). Quaternary alluvial deposits (Qa) characterise much of the underlying geology in the western and central portion of the Study Area (Priess & Reid 1999). This geological unit is described as cobbles, gravel, sand, silt and clay, red-brown in colour and often poorly sorted (Priess & Reid 1999). Developing soil horizons may be associated with this geological unit overlain by gibber plains and gypseous materials (Priess & Reid 1999).

These alluvium deposits overlay Quaternary alluvial fans (Qa<sub>2</sub>) (Priess & Reid 1999). Quaternary alluvial fans generally occur flanking bedrock outcrops and are consolidated though not cemented. Developing to strongly developed soil horizonation is common within this geological unit (Priess & Reid 1999). Holocene to modern stream alluviums and high-level terrace flood deposits (Qha<sub>3</sub>) occur to the west and east of the Qa and Qa<sub>2</sub> units, likely associated with extant waterways such as Hookina Creek. These alluviums are characterised as cobbles, gravel, sand, silt and clay and may contain boulders where they occur near ranges (Priess & Reid 1999).

The Wilpena Group extends within the eastern portion of the Study Area. This group is formed by the Barley Range Siltstone Member (Nsbb) overlaid by the Wilcolo Sandstone Member (Nwbw) (Priess & Reid 1999). The Bayley Range Siltstone Member consists of thickly bedded siltsone and sandstone with current ripples, planar tabular cross-bedding and herring bone cross-bedding (Priess & Reid 1999). The Wilcolo Sandstone Member consists of thin pebbly lag sandstone or massive coarse-grained sandstone of fluvial to shallow marine origin (Priess & Reid 1999).

The Study Area is located within the Lake Torrens Basin, which forms part of the larger Lake Eyre Basin. A north to south trending ridgeline (the Wilpena Group) occupies the eastern extent of the study area and the majority of the study area occupies a predominantly flat floodplain. Lake Torrens is located approximately 21 kilometres to the west. Lake Torrens is of tectonic origin lying within a depression in the earth's crust bordered by parallel faults with lacustrine sediments of Cainozoic age (60mya) (Timms 2007). Lakes Torrens generally has a water level of lower than two metres with rare episodic filling events associated with unreliable summer monsoons (Timms 2007).

Hookina Creek runs along the southern boundary of the Study Area. An unnamed watercourse runs north to south through the centre of the Study Area. Hookina Creek features three Quaternary depositional phases indicating the antiquity of this watercourse (Grun *et al* 2008). These phases are identified as:

- i. Valley-fill alluvium comprised basal carbonate-cemented conglomerate, finer-grained fluvial sediments and flood plain silts
- ii. River terraces inset into the present river channel
- iii. Sand dunes overlying the valley-fill alluvium (Grun et al 2008: 923).

Fossils vertebrate remains including megafauna have been recorded in association with Hookina Creek exposed by stream incision into outwash alluvial fans and paleochannels (Grun *et al* 2008; Twidale 1969). These remains are generally found in channel facies and in some floodplain sediments.

The Study Area is located within the South Australian Arid Lands National Resource Management (NRM) Region. This region is characterised by low annual rainfall and high evaporation rates. When rain does occur, it is generally in high intensity events resulting in flooding. Given the flat terrain of the area, surface features of collected water form clay pans, small lagoons and dry salt lakes such as Lake Torrens (Lampert & Hughes 1987). High rainfall events may result in the filling of lakes, such as Lake Torrens. Lake Torrens which was filled for the first time in 100 years following the flooding event of 1989 (ARUP/ENSR 2009: 315). The deep chasms and gorges of the Flinders Ranges are generally more likely to retain water for longer periods than the lower lying open alluvial fans and clay pans (Hughes & Lampert 1988). Flood modelling for the Study Area is currently being undertaken. The effects of flooding on the Facility would be addressed in a separate specialised technical report (DIIS, pers. comm., July 2018).

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Vegetation within the Study Area is characterised by Tall and Low Shrubland and Open Woodland typical of the Australian Arid Zone (Specht & Wood 1972: 165). The frequent droughts, low annual rainfall and high evaporation rates of this zone mean that the distribution of plant species in the area is influenced by the underlying soil profiles in the area (Specht & Wood 1972). The Study Area features low shrubs up to two metres tall, comprising an open community with approximately 10% to 30% foliage cover. Two dominant low shrubland species found in the area are the *Atriplex vesicaria* (bladder saltbush) and *Kochia sedifola* (bluebrush, pearl bush). Bladder saltbush plants have a shallow root system and are generally found on shallow soils with limited rainfall penetration due to a natural barrier up to 30 centimetres. Bluebrush or pearl bush generally occurs on deeper soil profiles up to 60 centimetres deep where soils show rapid unimpeded deep rainfall penetration. This species may be limited to watercourses in periods of low rainfall. The tall shrubland vegetation communities are generally populated with various types of Acacia species. Trees are widely spaced and low shrubland species or hummock grasses may comprise the understory.

The Flinders Ranges is home to a diverse range of fauna supported by the diverse habitats that occur throughout the region (Brandle 2001). Native species such as echidnas, kangaroos, wallabies, including the yellow-footed wallaby, possums, dannarts, native mice and rats as well as a range of birds, lizards and fish have been identified throughout the area (Brandle 2001; HWG pers comm Jan 2018). Native fauna likely to be associated with the Study Area include those characteristic of open plans landforms and tall and low shrubland vegetation communities (Brandle 2001). This includes red kangaroos and dunnarts whilst species such as euro kangaroos and yellow-footed rock wallabies may be present in the rockier eastern portion of the Study Area (Brandle 2001: 115).

The environmental features of this local region provided ample resources for Adnyamathanha people in the past and today. The underlying geology of the region includes materials suitable for stone tool production such as silcrete, quartz and cherts whilst the incised creeks and gullys of the Flinders Ranges and subsurface acquifers provide water. The local area features an abundance of ancillary resources such as animals and plants influenced by the ancient landscape that has formed over millions of years.



#### Figure 5.1 Underlying geology with Study Area

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## 5.3 Aboriginal ethno-historical context

[Personal communication has been redacted from this section of the report – in all instances personal communication supplemented information found in ethnohistorical sources and redactions do not alter the content of information provided]

The Flinders Ranges are home to the Adnyamathanha people. Adnyamathanha translates to English as "hills or rock people" (Brock 1985: 12; HWG pers comm Jan 2018). The Adnyamathanha people of today are descended from four groups that occupied the Northern Flinders Ranges at the time of white occupation, the Wailpi, Guyni, Yadliaura and Pilatapa (Brock 1985: 12). These groups and those on the plains to the east and west shared a common language with localised dialects and followed similar customs (Brock 1985: 12). The formation of the Adnyamathanha people from these groups has been attributed to two potential causes. The first of these is that the different groups became subsumed under one name through the process of intermarrying (Brock 1985: 12). Another suggestion is that the groups combined following white invasion as resources were depleted and disease and violence reduced the population of the Flinders Ranges (Brock 1985). The formation of the Adnyamathanha in described in the Dreaming or *Muda* oral traditions which continue today (Tunbridge 1988).

Adnyamathanha is a matrilineal moiety system, whereby a child will belong to the moiety of its mother (Brock 1985; HWG pers comm Jan 2018). There are two moieties within the Adnyamathanha community, Mathari and Ararru and within each moiety there are totem groupings (Brock 1985). Totems are generally associated with animals from the different regions of Adnyamathanha territory (Brock 1985).

Adnyamathanha life and culture are intimately connected with the natural environment. Knowledge of the land, law, water and food resources is passed down from *Muda* and through the retelling of these histories and this makes up much of the fabric of day-to-day life (Bonney 2007). People remember where significant events have taken place such as births and deaths and associate particular land marks such as trees or camp areas with these events (Brock 1985). Marsh describes this sharing of culture and knowledge throughout the community across generations as a collective entity, an Adnyamathanha view that forms an intrinsic part of Adnyamathanha identity (Marsh 2010: 123).

Adnyamathanha practiced a semi-sedentary lifestyle prior to white invasion. They travelled between campsites within their lands to access particular resources at different times of the year and according to ceremonial and social obligations (Brock 1985). Adnyamathanha shared in extensive long distance ceremonial and exchange links that extended across much of the Australian continent (McBryde 2000: 157). These links facilitated the exchange of physical goods as well as fulfilling cultural and social obligations and were intricately woven into Adnyamathanha life through the Dreaming (McBryde 2000; Tunbridge 1988). Song lines and ceremonial sites accompanied these exchange routes. Where the tracks of these songs originated outside of Adnyamathanha Country they may have been sung in different languages (Tunbridge 1988). The *Urumbula* song cycle is an example of an extensive song line and travel route that covers 900 kilometres crossing the Country of several distinct social and linguistic groups linking Port Augusta with the Gulf of Carpenteria (McBryde 2000: 157). The songs were sung in Aranda even though the route passed through different language group territories (Hercus 1992). Each group was responsible for maintaining the section of the song cycle within their lands and the significant sites associated with it (McBryde 2000).

Song lines not only record the activities of ancestral beings during the Dreaming, they also function as a map constructed around prominent landforms guiding people through a landscape. Prominent landform features such as mountain peaks and high mesas often form markers for these song lines used to orient a person or group as to where they are in the landscape, the song line and Country.

The Parachilna ochre mine near Pukardu Hill is a geological feature associated with another significant trans-continental cross-cultural trade route and song cycle (Wilton *et al* 1980; McBryde 2000). The Parachilna ochre mine is located to the northwest of the Study Area. Parachilna ochre was renowned for its



high-quality colour and gloss and was traded from the Flinders Ranges north to the Central desert, south past Port Augusta and into NSW and Queensland (McBryde 2000). The red ochre was particularly valued and reserved for special occasions (Wilton *et al* 1980). Australian Aboriginal peoples such as the Diyar of Cooper's Creek, Wangkangarru of Simpson Desert and Wangkumara of northwestern NSW are documented as travelling to the Flinders Ranges to trade for the ochre (McBryde 2000: 158). The ochre mine and travel routes are associated with the ancestral paths of the Dreaming Emu and Dingo Ancestors (Walshe 2005). Groups travelling to access the ochre were expected to engage in rituals and ceremonies maintaining amicable relationships and trade (McBryde 2000).

Relations between groups trading Parachilna ochre were not always good-natured, with fights erupting over the possession and use of the ochre in the 1860s (Wilton *et al* 1980). A raiding party in 1865 from the north attacked and robbed a shepherd's hut at nearby at the Beltana property sparking European interest into the trade route and government intervention (Wilton *et al* 1980; McBryde 2000). The South Australian Government attempted to prevent the Diyari from travelling south by supplying them with ochre from a source near Adelaide in 1874 (Wilton *et al* 1980; McBryde 2000). This ochre was far below the high quality of the Parachilna ochre however and it was reported that the Diyari would not use it (McBryde 2000: 164). The area was eventually gazetted as an Aboriginal reserve in 1905 (McBryde 2000).

Archaeological sites provide evidence for the wide array of food resources exploited by Adnyamathanha including large game such as kangaroos, birds such as emus, cockatoos and galahs, fresh water mussels, various seeds and roots (HWG pers. comm Jan 2018; Smith *et al* 1991). The bark gathered from Red Gums, *Wida*, could be used to produce dishes, *Yadlu* and shields, *Tiparu* (Bonney 2007: 26, PAARC 1976). The leaves from *Wida* could also be used for cooking in ground ovens (Bonney 2007). Other wooden implements utilised include spears, *Walata* and boomerangs, *Wadna* and wooden clubs such as the *Vira* and *Wiri* used for fighting or hunting respectively (PAARC 1976). Stone tools were used as cutting implements or hafted to a wooden handle using gum and sinew to form an axe (PAARC 1976). Adnyamathanha people continue to manage the land through regular burning (Bonney 2007:23; T. Clark pers. comm. Jan 2018). As well as reducing the threat of wildfire, regular burning is vital for the regeneration of a range of native plants (Bonney 2007: 23). Fire can also be used as a hunting method for large game such as kangaroos (Bonney 2007: 23). Adnyamathanha encouraged and strategically planted fire retardant plant species to act as firebreaks during cultural burning.

The arrival of Europeans in the Flinders Ranges had devastating and irreversible impacts on Adnyamathanha life. However, despite the invasion and dispossession of their lands Adnyamathanha people were able to adapt these changes and retain their cultural practices and links to Country albeit in modified ways (Brock 1988). Pastoral interests in the Flinders Ranges region increased after 1951 following the introduction of fourteen-year pastoral leases by the South Australian Government (Wilton *et al* 1980). The first pastoral stations, Wilpena, Arkaba and Aroona were established as sheep stations in the same year (Wilton *et al* 1980). Pastoral and agricultural expansion in the region impacted much of the economic base for Adnyamathanha life (Brock 1988). Access to water was restricted by white landowners and introduced cattle and sheep competed with native species for resources leading to disruptions to Adnyamathanha traditional resources and cultural sites (Brock 1988). Disputes over the spearing and theft of sheep eventually led to violence during the 1840s and 1850s (Wilton *et al* 1989: 11).

Despite these clashes many Adnyamathanha men found employment in the pastoral industry and families established camps near homesteads (Brock 1988). Mount Serle and later Rams Paddock Gate were locations of Adnyamathanha camps during this period (Brock 1988). Ceremonial life appears to have continued after the arrival of pastoralists in the Flinders Ranges. Remains associated with initiation grounds were identified at Rams Paddock Gate during an archaeological survey of the area in 1981 (S. A Heritage Unit in Brock 1988: 281). Whilst maintaining their cultural traditions Adnyamathanha also adopted European practices, dressing in European clothing, adopting firearms into their hunting practices and incorporating rations such as sugar and flour into their diets (Brock 1988). Two cemeteries were established at Rams



Paddock Gate for the Araru and Matheri respectively (Brock 1988). These burials demonstrate a combination of Adnyamathanha and European practices with burials oriented south west in the Adnyamathanha manner and with stone borders in the European manner (Brock 1988).

Following the arrival of the United Aboriginal Mission (UAM) in the Flinders Ranges in 1929, the Rams Paddock Gate settlement moved to Nepabunna in 1930 (Brock 1988). This period saw the further breakdown of Adnyamathanha traditions due to white settlement. Travel over pastoral stations was increasingly limited, which restricted Adnyamathanha from visiting parts of their traditional lands. The missionaries discouraged Adnyamathanha from practicing initiation ceremonies. In some cases violence was used to discourage Adnyamathanha from practicing these traditional cultural activities. This has been attributed in some ways to the general silence which surrounds Men's Business and the reluctance of Adnyamathanha men to record male cultural knowledge.

Traditionally only initiated Adnyamathanha men, *Wilyaru*, were permitted to take wives (Tunbridge 1988: xliv). With a growing number of uninitiated Adnyamathanha males wishing to marry this led to the increased adoption of Christian marriages and the breakdown of traditional marriage ceremonies (Brock 1988).

Today many Adnyamathanha live on Country in Hawker, Yappala Station and further afield in Port Augusta, Cooper Pedy and other Australian states (HWG pers. comm. Jan 2018). Through over two hundred years of white contact the Adnyamathanha people have shown adaptability and strength in retaining their culture, identity and connection to Country. In consideration of evidence for climate fluctuations, environmental change and the ongoing impacts of colonisation over the past 50,000 years, Adnyamathanha demonstrate a long and deeply entrenched history of adaptability and resilience.

#### 5.4 European land use context

The arrival of Europeans in Australia had a profound and devastating effect for Aboriginal people across the continent. The first documented arrival of Europeans to the Flinders Ranges area was in 1082, when Matthew Flinders sailed up the Spencer Gulf in a sloop named *The Investigator* (Bonney 2007:12). During this expedition, Flinders gave many of the surrounding landmarks European names such as 'Mt. Brown' and 'Mt. Arden.' Flinders put a land party to shore, where they trekked through the local hills and collected botanical samples. There is no recorded contact from Flinders with the local Aboriginal people during this expedition, however, it is likely that the exploration party was observed by Adnyamathanha, Nukuna and Barngarla people (Bonney 2007:12).

The next recorded European visit to the area was 38 years later when Edward Eyre, under the organisation of Captain Charles Sturt, embarked on an over-land expedition into 'the interior of Australia' (Bonney 2007:12). Eyre, who had travelled north the previous year to the top of Spencer Gulf and beyond had observed Lake Torrens, described the area as a 'dry, barren landscape.' It was during this expedition that Gawler named Mount Eyre (Boney 2007:13). It was also on these expeditions that Eyre had his first contact with the local Aboriginal community. At Scott's Creek, Eyre's second-in-command captured and held an Aboriginal woman for several days (Wilton *et al* 1986: 11). 50 or more Aboriginal men are recorded as threatening the explorer's camp, though no blood was shed. Eyre gave one of the men a tomahawk and released the Aboriginal woman, and the expedition continued on (Wilton *et al* 1986: 11).

Within the 20 years following Eyre's expedition, a large number of pastoral farmers came to the area. These farmers often took up long-term crown leases of vast tracts of land and many introduced cattle and sheep (Bonney 2007:16). In order to sustain these animals, European settlers were known to take over water holes considered sacred by the Adnyamathanha people and mortality rates within the local community began to rise due to such epidemics as influenza and measles (Bonney 2007:15). Several conflicts between Adnyamathanha men and European settlers erupted over disputes regarding sheep often resulting in deaths on both sides (Wilton *et al* 1980:11).



From 1870 onwards, European settlement of the area began in earnest. Several years of good rainfall coupled with long-term leases had encouraged farmers to move to the area (Wilton *et al* 1980:11). The 'Great Northern Railway' was constructed from Port Augusta to Maree in 1879, intended to service the region for the transport of agricultural and pastoral material and stock (Plate 5.1). The rail initially consisted of a narrow gauge through the Pitch Richi Pass to Quorn and Hawker and was extended along the western side of the Flinders Ranges to Marree in 1883 (Wilton *et al* 1980:11). A period of severe drought followed, which severely impacted established pastoral leases and agricultural interests in the area.



#### Plate 5.1 Hookina Bridge, Great Northern Railway (State Library of South Australia: c. 1880)

### Wallerberdina Station

Wallerberdina Station has a long history of European land-use for pastoral purposes, including the grazing of cattle and sheep (see Plate 2 and Plate 5.3). The earliest available records of the area are from 1876, when a land grant was made for the local cemetery in Hookina. The grant, measuring five acres and made by the Governor of South Australia was made to several trustees, one of whom was recorded as 'Robert Bruce, a sheep farmer of Wallerberdina' (Austral Archaeology 1995:84). In 1879, a stock report published in the *Adelaide Observer* stated that 2,056 wethers, from Wallerberdina Station were sold for Mrs Hayward, Armstrong & Browne (Adelaide Observer 13 Dec 1879:2).





Plate 5.2 Map of 'Section 2' taken from John Sands "The New Atlas of Australia" with Wallerberdina indicated (Sands: 1886, NLA Plate 9 (SA) MAP RaA 30)

In March of 1898, the South Australian Pastoral Commission travelled from Leigh's Creek to Hawker as part of a survey of the extent of the drought in the region (The Advertiser 9 Mar 1898:5). Travelling over 'flat, dead saltbush plain' brought the commission to Wallerberdina Station, which was owned by a Mr. Bevan and where the commission rested for the night. The station had lost a large percentage of stock to the drought. Of 9,000 sheep only 1,100 remained, which had been saved only by the assistance of '*Cummings & Matherson's country and by cutting down mulga branches*' (*The Advertiser* 9 Mar 1898:5). The station, noted as being a block of 50,000 acres during this period was considered 'too small' to make a living on by Mr. Bevan, but that he had given it a good trial – living on the property for 18 years. Of particular interest to the commission was a corrugated iron galvanized tank, designed to hold 19,000 gallons of water, and the existence of a well-proportioned shearing shed on the property. It was noted by the commission that although the land was '*dry and hopelessly eaten out until Hookina'* that Hookina Creek had 'good water' (The Advertiser 9 Mar 1898:5). Later that month, the *Chronicle* also published the same piece on the pastoral commission (Chronicle 26 Mar 1898:43).

In 1923, an announcement appeared in *The Register* reporting that Wallerberdina, a 'well-known station property' had been sold, together with all stock and plant and compromising an area of 50,883 acres by Bennet and Fisher on behalf of Ross Sawer to John Conrick, a 'well-known man in pastoral circles' (The Register, 18 Jan 1923:4). Conrick, born in Victoria in 1852 had by this stage owned pastoral land in Australia for more than five decades (Conrick, John. Obit. Aus). John Conrick was known to boast of his relationship with the 'aborigines,' [*sic*] especially upon his establishment of his first station in 1871, 'holding that their rights should be respected with regards to food and water.' John Conrick was also known for his in-depth knowledge of his land, that in case of drought he should 'be able to get as many of his cattle and sheep away to good country as possible' (Conrick, John. Obit. Aus). Upon his death in 1926, the Wallerberdina property passed to one of his sons, Clive Conrick.

A piece covered in the *Quorn Mercury* detailed a trip the author took from Hawker to Lake Torrens in October 1927, a year after John Conrick's death (Quorn Mercury 28 Oct 1927:1). The author travelled the road from Hawker to Lake Torrens, which ran through Old Hookina and through Wallerberdina Station, now owned by Mr Clive Conrick. The author also remarked that while these stations showed signs of the 'dry spell' that was


currently affecting the area, Wallerberdina had had very good shearing, and had 65% of lambs this year (Quorn Mercury 28 Oct 1927:1). The article also mentioned Hookina Creek holding good water for stock. In October of the following year, a trip was once again planned for Lake Torrens Station. The area was still in the midst of a bad drought, with a great number of sand drifts occurring along the route from Hawker to Lake Torrens. In particular, it was noted that Wallerberdina was in a bad state (Quorn Mercury 26 Oct 1928:1).



Plate 5.3 Grassy Flat at Wallerberdina Station (State Library of South Australia: 1937)

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Though the pastoral lease held by the Conrick family was not set to expire until 1980, the station, now comprising 50,861 acres was sold by public auction in March 1950. The purchaser, Mr C. G. Stewart purchased the property, including 4,000 sheep and lambs in the wool 'on behalf of himself and others' (The Advertiser 17 Mar 1950:4).

The earliest available legal title document for the property is a Crown Lease from 1962, issued to 'Wallerberdina Pastoral Company Limited' for a period of 40 years. This lease, containing 'seventy-nine and forty-three hundredth' square miles of land (equal to 50,861 acres) was issued under the following covenant;

'The lessee must stock the land with sheep, cattle or sheep and cattle combined so that for every square mile there shall be five head of sheep or one head of cattle, provided that the total number of animals on the property did not exceed 700.' (CL Vol. 1280 Fol. 1)

Part of the property was subject to an underlease issued to a Henry Vincent Henschke, who held this lease from 1959 to 1980 (CL Vol. 1280 Fol. 1).

The land subsequently underwent a period of surrender, transfer and underlease with the square mileage of the property subsequently being reduced. On the 9<sup>th</sup> of October 1996 the Crown Lease was partially surrendered, with the area in the lease reduced to 173 square kilometres (approximately 67 square miles or 43000 acres), now representing Lots 54 & 55 in Deposited Plan (PDP) 46041 (CL Vol. 1280 Fol. 1). On the 4<sup>th</sup> of July 1997, transfer was undertaken to Rosdale Pty for an unknown portion of land. On the same day, a portion of the land was leased to Partacoona Pastoral Co. Pty. Ltd. For a period of 35 years. Several additional dealings occurred in 1997, including the lease of an unspecified parcel of land on the property to Glen Robert Wandel and Judith Raelene Wandel (CL Vol. 1280 Fol. 1).



The next available transfer information concerns a dealing in 2005, when the land was transferred to Wallerberdina Pty Ltd, of 10 Northumberland Street Heathpool and leased once again to Rosdale Pty Ltd (CL Vol. 1280 Fol. 1). The following transfer occurred in March 2011, when the title was transferred to Buckleboo Nominees Pty Ltd. Three months later, on the 29<sup>th</sup> of June 2011 the land was once again leased, with the lease holders listed as Annette Kay Davidson, Darryl James Davidson, Mark William Davidson and Scott James Davidson (CL Vol. 1280 Fol. 1). The land was leased by the Davidson family until it was leased once again, this time by a Questar Australia Pty Ltd, with the lease term commencing on the 1<sup>st</sup> of September 2014 and expiring on the 28<sup>th</sup> of July 2016 (CL Vol. 1280 Fol. 1).

Wallerberdina Station is currently leased by Grant Chapman, former Liberal Senator, though he is not known to live on the property (ABC News 17 Nov. 2015).

### 5.5 Aboriginal archaeological context

The earliest dated archaeological records of Aboriginal people in in the region come from Port Augusta (40,000ya) and the Flinders Ranges (49,000ya) (Hamm *et al* 2016; Walshe 2012). Evidence of Aboriginal occupation elsewhere in Australia dates to 65,000ya, based on recently excavated rock shelter site at Madjedbebe in the Northern Territory (Clarkson *et al* 2017). It is therefore highly likely that Aboriginal people were occupying much of the continent during the periods of climatic fluctuations that characterise the Late Pleistocene and early Holocene.

The Study Area is located within the Australian arid zone (Plate 5.4) which provides a context for understanding Aboriginal occupation of the region The arid zone is defined as the area in Australia where evaporation equals or exceeds precipitation (Edwards & O'Connell 1995). Much of the archaeological discourse surrounding the Australian arid zone has centred around human responses to fluctuating climatic conditions (Lampert & Hughes 1988; Veth *et al* 1990, Walshe 2005).

Paleoclimate reconstructions compiled through analysis of speleotherm, geomorphology, pollen and charcoal records indicates that over the past 60,000 to 50,000 years that the Arid Zone has gone through periods of increasing and decreasing temperatures, humidity and rainfall (Walshe 2005; Williams *et al* 2015). Archaeological data throughout that time indicates that humans have adapted their technologies and economies to adapt to these significant changes through time (Veth 1989).



# Plate 5.4 The Australian arid zone showing present limits (after Mabbutt 1971), estimated limits at Last Glacial Maximum (after Veth 1993) (from Edwards & O'Connell 1995).



Evidence gathered from the Lake Eyre Basin suggests wetter and cooler conditions prevailed in the southern arid zone around 55,000 to 40,000ya and again at 26,000 to 22,000ya (Walshe 2005). Pleistocene flooding events were extensive and are well documented for the Lake Eyre Basin (Timms 2007). Periods of increased rainfall resulted in the formation of mega lakes across much of the interior (Williams *et al* 2015). Evidence from other inland lakes such as the Willandra Lakes and Lake Mungo in NSW and rivers in the Murray-Darling River dated between 50,000 and 42,000ya indicate water levels were much higher at this time (Cohen *et al* 2011; Lampert & Hughes 1988: 141; Walshe 2005). This increase in water levels and low temperatures would have influenced monsoonal weather patterns and reduced evaporation (Walshe 2005: 31). Prior to the LGM, Aboriginal occupation of sites was generally sparse indicating that groups were highly mobile (Williams *et al* 2015). This is suggested based on the low density of artefacts from pre-LGM archaeological deposits. For example 22 artefacts were retrieved from the lower units of Puritjara Rockshelter compared with 12,677 artefacts retrieved from Holocene deposits (Williams *et al* 2015: 99).

Conditions within the arid zone during the LGM are generally characterised as dry and cold (Edwards & O'Connell 1995: 772). It is likely that climatic changes were gradual over time. Thermoluminescence (TL) dates from sites in the Strezlecki Desert indicate dune building underway at least 25,000ya, suggesting increasing aridity towards the onset of the Last Glacial Maximum (LGM) (Lampert & Hughes 1988:141). Water would have been scarce during this time and vegetation and faunal populations would have been reduced from their former levels. Climate conditions appear to have ameliorated after around 16,000 to 17,000yBP (Cohen *et al* 2011). Pollen data and sedimentary records taken from the floor of Lake Frome indicate increased levels of precipitation and revegetation of the shoreline (Cohen *et al* 2011: 169; Smith *et al* 1991: 190). Mega fauna fossils identified in association with Hookina Creek also hint at the favourable climatic conditions (Twidale 1969: 47). Evidence from Hookina Creek, Lake Frome and Lake Torrens all indicate that by 13,000yBP these waterbodies were at much higher levels than they are today (Lampert &



Hughes 1988; Smith *et al* 1991; Twidale 1969). Towards the end of the Pleistocene summer monsoons would have occurred across the southern arid zone. It is likely that during this time vegetation and faunal populations increased thus attracting people to these areas.

Warming climatic trends appear to have increased after approximately 14,500yBP, peaking at around 5,000 to 7,000yBP (Edwards & O'Connell 1995; Smith *et al* 1991). Pollen analyses for samples dating to this period indicate vegetation changes corresponding to drier and more arid conditions (Walshe 2005). Lake Frome and Lake Torrens retreated to their current state and the modern weather patterns of frequent drought and low rainfall were established. Archaeological data indicates there was widespread occupation of the Australian interior during the favourable conditions of the Holocene with a period of decline in the spread of sites after around 3,000ya (Williams *et al* 2015).

Various models have been devised to explain human occupation of the arid zone during the periods of climate oscillations described above. Veth's model explains human use of the landscape within a biogeographical framework through the concepts of refuges, barriers and corridors (Veth 1989). Fluctuating climate patterns are likely to have resulted in large areas of the arid zone becoming barriers to human occupation at various times (Veth 1989:84). Conversely as temperatures dropped and climates became drier other landforms would have become refuges for human populations (Veth 1989).

Refuge landforms are described as piedmont or montane uplands and riverine or gorge systems providing networks of permanent water sources (Veth 1989). Uplands such as the Flinders Ranges and the Hammersley Plateau in Western Australia are examples of refugia. The density of sites within the Flinders Ranges illustrate the use of the area as a refuge during harsh climate phases (Williams *et al* 2015). Excavations in rock shelters such as the Warratyi Rockshelter show continuous occupation from 49,000ya until around 10,500ya (Hamm *et al* 2016). Warratyi Rockshelter is also significant for the association of remains of megafauna *Diptoprodon optatum* and eggshells of a large megapode bird *Genyornis newtoni* with human occupation (Hamm *et al* 2016). The location of the rock shelter at the top of a steep slope suggest that that it is unlikely that *D. optatum* would have climbed to the rock shelter alone and absence of carnivore teeth marks on the bones suggest that they have an anthropogenic origin (Hamm *et al* 2016).

Barrier landforms may have been temporary or continuous and generally consisted of inhospitable landscapes such as sandy deserts (Veth 1989). Temporary barriers may have acted as corridors at times during the LGM and after (Veth 1989). These landscapes include peripheral areas of deserts such as the Great Sandy Desert and large tracks of land between refuges and barriers (Veth 1989).

Archaeological site JSN located within the Strzlecki Desert to the north of the Study Area contains occupation deposits dated to between 15,000 and 10,000yBP (Smith *et al* 1991). The site consists of an extensive low density artefact scatter spread over an interdunal pan (Smith *et al* 1991). Charcoal stained sediment and concentrations of baked-clay lumps were identified on the dune surfaces (Smith *et al* 1991). Excavations of these areas identified at least five individual hearths utilising baked clay heat retainers associated with several pieces of freshwater shell (Smith *et al* 1991). One of the hearths showed evidence of re-use on separate occasions. A radiocarbon date taken from the charcoal of this feature retrieved a date of 14,400 +/- 200yBP (Smith *et al* 1991: 180). The large size of the feature could indicate that large game was hunted and bought back to the site to cook and eat (Smith *et al* 1991). The stone artefact assemblage was considered to represent a late Holocene tool kit containing backed blades, unifacial pirri points and seed grinders (Smith *et al* 1991). The comparison of raw material sources and the JSN assemblage and site location indicates that materials were brought into the site over great distances (Smith *et al* 1991).

Based on the archaeological evidence collected at JSN, the site represents occupation of areas benefiting from warmer and wetter conditions during the late Pleistocene/early Holocene (Smith *et al* 1991; Williams *et al* 2015). This site can be interpreted as a temporary corridor as people travelled north of the Flinders Ranges towards the desert interior. This may have been associated with people following game, suggested by the large size of the hearths and repeated use, or other cultural activities.

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Hawker Lagoon is an archaeological site located to the south of the Study Area. This site was originally excavated by Lampert & Hughes during the late 1980s and again in 2001 and 2002 by Flinders University and representatives of the Adnyamathanha community (Walshe 2005). The site occupies the northern end of a valley between steep quartzite ridges that converge to form a narrow gorge at the northern end. The lagoon is described as a canegrass swamp slightly less than one kilometre wide which is frequently dry (Lampert & Hughes 1988). When Lampert and Hughes were first introduced to the site they identified high density artefact scatters eroding onto deflated, exposed surfaces below remnant dunes and a lunette (Lampert & Hughes 1988). A total of 1,451 stone artefacts were identified on the ground surface consisting of cores, core tools, flakes and adzes (Lampert & Hughes 1988: 141). Two types of raw materials were identified at the site, quartz and silcrete, pebbles and outcrops of which are abundant in the local area (Lampert & Hughes 1988: 141). Radiocarbon dates taken for the site indicated a Pleistocene occupation and the site was interpreted to represent a refuge landscape during the LGM (Lampert & Hughes).

The archaeological excavations conducted by Flinders University and representatives of the Adnyamathanha community identified discrepancies between the findings of Lampert & Hughes and the archaeological data collected (Walshe 2005). Lampert & Hughes encountered a heath feature 1.3 metres below the ground surface which was dated to 15,000ya whilst the later excavations did not identify any archaeological material 20 centimetres below ground surface (Walshe 2005: 31). Despite excavating 32 test units across a representative sample of landforms within the site no artefacts were identified more than 15 centimetres below the ground surface (Walshe 2005). Five surface hearths were selected for dating retrieving ages all within the last 1,500yBP.

Archaeological surveys completed at the same time as Walshe's (2005) excavations identified a range of Aboriginal sites within the valley area including painted and engraved rock art sites, a silcrete outcrop with evidence of quarrying and tool making, numerous surface artefact scatters, post contact modified glass artefacts, scarred trees and stone cairns (Walshe 2005). This was interpreted by Walshe to indicate that Aboriginal people had occupied the valley repeatedly over a long period of time. However, without stratified deposits and reliable carbon samples it was not possible to quantify the period of occupation (Walshe 2005).

### Previous cultural heritage assessments

[Statements which identify the details or location of Aboriginal sites and places have been redacted or amended in this section]

## Archaeological investigations at Olympic dam in arid northeast south Australia – Hughes, Hiscock, Sullivan & Marwick, 2011

This report by Hughes, Hiscock, Sullivan & Marwick outlines a large ongoing research-oriented salvage program that has evolved from past archaeological impact assessment studies at Olympic Dam in arid northeast South Australia.

In the course of archaeological investigations for the proposed Olympic Dam mining project in 1980, Hughes and Hiscock developed an environmentally-based predictive model that used terrain pattern mapping based on a combination of landform types, which were used to predict the location and frequency of occurrence of suitable 'campsites', sources of water and the ease with which people could move across the landscape (Table 5.1), and underlying geology which was used to predict the availability of different rock types which could be used for making stone artefacts (Table 5.2). Initially data from 133 archaeological sites and their environmental settings was used to develop and test the predictive statement. The model was then tested further using data from an additional 352 archaeological sites recorded in sample surveys at Olympic Dam and in a regional survey within a 50 kilometres radius of Olympic Dam. Use of the predictive model in the region extending from Spencer Gulf in the south to Lake Eyre in the north established the model as a useful tool for guiding further survey work or for projecting likely impacts from development.



## Table 5.1Predicted influence of landforms on the nature and distribution of archaeological sites<br/>(via Hughes et al 2011: 24)

Landform Type	Model Prediction
1 and 2 Tableland and Tableland with dissection slopes	Sites occur infrequently in these landform types and when they do they are mainly quarries and knapping floors where locally available raw materials have been exploited. The quarry sites are commonly very large (>1,000m <sup>2</sup> ) and have high density artefact scatter (1-10/m <sup>2</sup> ) of the locally available raw material. Where isolated dunes occur within these landform types they generally contain rich, diverse artefact scatters.
3 Drainage depressions	While archaeological sites occur infrequently in this landform type, they occur mainly on sand dunes around the margins of the large moisture-holding depressions which characterise this landform type. The sites tend to be very large and to have very high densities of artefacts (>10/m <sup>2</sup> ). These is also a very high diversity of raw material types and a wide range of implement types. This combination of characteristics indicates that the drainage depressions and their associated dunes acted as focal points for occupation and supported a wide range of domestic activities.
4 Widely spaced dunes covering <30% of the land surface	Sites in this landform type are generally medium to large (10- 1,000m <sup>2</sup> ) and have medium to high densities of artefacts (0.1- 10/m <sup>2</sup> ) which include a range of implement types. Artefacts are made from a low to medium diversity of raw materials. Most sites are artefact scatters on sand dunes and tend to be concentrated around the interdunal pans. In terrain patterns formed on K, A and P sites occur with low to medium frequencies. In contrast on Czs, where silcrete crops out most frequently, quarry sites and associated knapping floors also occur and the frequency of occurrence of sites is very high. Compared with landform types 1, 2 and 3, sites in landform type 4 are more evenly dispersed across the landscape. Artefact scatters occur more frequently, are richer and are more diverse on those sand dunes which are adjacent to pans. In contrast, sites in dunes adjacent to quarries (especially silcrete) tend to consist of knapping floors with a low diversity of raw material. The richest sites in this landform type are to be found in dunes adjacent to areas where pans and silcrete quarries occur in close proximity.
5 Moderately spaced dunes covering 30 – 60% of the land surface	The nature and distribution of sites in this landform type follow the same pattern as that for landform type 4 except that sites occur much less frequently and tend to be less rich. This is taken to reflect the less common occurrence of pans and outcrops of raw material, due in part to the increased cover of sand.
6 Closely spaced dunes covering >60% and usually >80% of the land surface	Sites occur very infrequently in this landform type, because of the almost continuous cover of sand, the absence of water and stone sources, and the practical difficulty in traversing these landscapes.



## Table 5.2Predicted influence of geological regime on availability of raw materials for stone artefact<br/>manufacture (via Hughes et al 2011: 25)

Geological R	Regime	Description	Materials for Artefact Manufacture
Q	Quaternary	Aeolian sand dune fields and clay plans	No materials exposed
Czs	Tertiary	Silicified sandy beach ridges of ancient lake to the west	The main source of silcrete
к	Cretaceous	Deeply weathered kaolinitic siltstones, shales and sandstone (Bulldog Shale) – contains extensive deposits of ice- rafted pebbles, cobbles and boulders, predominantly quartzite	The main source of quartzite – some chert and quartz from the ice-rafted rocks – some silcrete from silicified weathered sediments
A	Cambrian	Andamooka Limestone	Main source of chert
Р	Precambrian	Simmens Member of the Arcoona Quartzite	Not suitable for flaking but possible source for grinding stone and hearthstones

Survey undertaken in the area between 2007 and 2009 found that the archaeological sites defined in Table 5.1 encompass the range of site locates and assemblage characteristics present over the wider region. Regional surveys undertaken for the Olympic Dam project by Hughes and colleagues have shown that the same kinds of archaeological sites, in the same range of environmental settings, continue in a north-south direction from Port Augusta in the south to Lake Eyre in the north, over a distance of about 45 Okilometres and over an area exceeding about 200 kilometres squared.

Consistent with the model, a substantial majority of archaeological sites assessed during the survey represent the evidence of short term occupation of the kind found throughout arid northeast South Australia, and arid Australia more generally. Large numbers of small sites containing assemblages with low richness in landscape context with no access to permanent water are typical archaeological signatures of mobile foragers, both in the region of Olympic Dam as well as in order arid zone contexts in Australia.

#### Cultural Landscape Mapping of the VYAC Yappala Group of Properties – Scribe Archaeology, 2015

The Viliwarinha Yura Aboriginal Corporation (VYAC) Yappala Group of Properties (YGP) are located on the western edge of the Flinders Ranges and consist of five pastoral stations, covering an area of approximately 17,595 hectares. The YGP border the Study Area to the west and south. Four of the five pastoral stations are now contained within the declared VYAC YGP Indigenous Protected Area (IPA), which is currently administered by the South Australian Aboriginal Lands Trust (ALT).

In August 2010 the VYAC ran a series of cultural heritage workshops to inform the broader Healthy Country IPA land management plan. The workshops identified a series of potential strategies to help preserve and promote the cultural heritage responsibilities of the VYAC. One of these strategies was to create a landscape map providing access to a broad central archive of traditional knowledge which has been amassed by the community. Over the past decade, the VYAC has worked closely with the South Australian Department of Premier and Cabinet, Aboriginal Affairs and Reconciliation Division (DPC-AARD now DSD-AAR) to record some of the many important cultural places in and around the YGP, including the DPC-AARD sponsored VYAC Yappala and Surrounding Area Song and Story-line Recording Project which took place between 2008 and 2012. Additional site recording work within the broader YGP was undertaken under the guidance of the local Aboriginal community and included cultural heritage recording and training workshops for the broader VYAC community.



The project resulted in the VYAC Yura Malka Cultural Landscape Map and associated Information Pack, which acknowledges the ancestral names and associated characters of the hills, valleys and plains in and around the YGP.

The map and information pack provide a 'consolidated framework for not only recording and storing culturally important traditional information, it proves an accessible platform for the future transmission and transference of that information throughout the broader VYAC community and to the rest of the world'.

### Hydrogeological assessment of Hookina Spring (Pungka Pudanha), Flinders Ranges – Department of Environment, Water and Natural Resources, 2015

The Department of Environment, Water and Natural Resources (DEWNR) undertook a hydrogeological assessment of Hookina Spring in 2015. Hookina Spring forms part of Hookina Creek and is of cultural significance due to its healing properties. The conservation of the spring, and Hookina Creek, is a high priority for the local Aboriginal community. DEWNR found that the springs do not have a readily distinguishable or accessible discrete source, which is common in springs in South Australia. Water samples were collected from a waterhole in Hookina Creek, and an equipped stock well (Bobby Creek Bore) located six kilometres south of the spring. The samples were analysed for cations, anions, metals and carbon isotopes. Analysis showed there is a strong similarity between both the waterhole and the stock well water. The likely upper limits to the age of the water are 1700 and 3000 yBP respectively, which indicates a regional source for the spring. Groundwater recharge is a natural part of the hydrological cycle and occurs through the drainage of surface water through soil.

An indicator that groundwater discharge has been occurring for a long period of time is the presence of a very hard cemented conglomerate in the creek bed. Widespread fracturing and local vertical upward displacement of the conglomerate suggests the area is still seismically and tectonically active. Earth tremors are still felt regularly in the area. Two south-west to north-east trending faults appear to control the direction of Hookina Creek and a tributary. The fault lines can be identified by the occurrence of lush vegetation. This suggests that faulting may provide a conduit for groundwater discharge from deeper aquifers. "Mountain block recharge" may be the source of water for Hookina Spring. Rainfall falling on the Yappala and Elder Ranges has slowly infiltrated down into the fractured rock aquifers. Groundwater within these aquifers flows under gravity towards the lowest point in the landscape, which happens ot be Hookina Creek at approximately 140 metres Australian Height Datum (AHD). DEWNR note that 'the age of the spring water beers no relationship to the period that the spring has been flowing, or the period of occupation by Aboriginal people. If a major earthquake today triggered movement on a major fault resulting in a new spring discharge point nearby, the age of the water should probably still be over 1000 years old'.

Although the salinity of the sampled water is above the recommended limit for human consumption, the spring would have been a valuable drinking supply for short periods if no other source was available. It is unlikely that Hookina Spring has a local source, as the low current rain fall, and recharge rates could not maintain the observed discharge flows. As it appears that there is a regional source for Hookina Spring, DEWNR found that it is unlikely that the spring flow rate would be affected by local or short-term influences such as droughts or changes in land use, including local changes in land management. Significance increases in groundwater extraction on the plains to the east of Hookina Creek could reduce the spring flow by interrupting the flow from the ranges.

### Previously identified archaeological sites

[A previously identified archaeological site is located partially within the Wallerberdina Study Area. Since the inception of heritage assessments at Wallerberdina, the Department has considered it a high priority to avoid any potential impacts the site. The locations of the Geoscience Australia identified 100 hectare locations and



Project Areas East and West (Figure 1.1) were proposed in order to provide distance between the potential Facility locations and the site, as well to avoid other environmental constraints.]

No other previously recorded archaeological sites are registered on the DSD-AAR database. RPS has been advised that ATLA may have site recording in progress which pertains to the Study Area. RPS has endeavoured to access this information, however, no information has been forthcoming from ATLA.

### 5.6 **Previously identified areas of Aboriginal cultural significance**

[A recorded song line is located partially within the Wallerberdina Study Area. Since the inception of heritage assessments at Wallerberdina, the Department has considered it a high priority to avoid any potential impacts to the registered site area of the song line. The locations of the Geoscience Australia identified 100 hectare locations and Project Areas East and West (Figure 1.1) were proposed in order to provide maximum distance between the potential Facility locations and the registered site area, as well to avoid other environmental constraints.]

No other previously recorded areas of Aboriginal cultural significance are registered on the DSD-AAR database. RPS has been advised that ATLA may have site recording in progress which pertains to the Study Area. RPS has endeavoured to access this information, however, no information has been forthcoming from ATLA.



### Figure 5.2 Previously recorded sites located within the Study Area

[Figure redacted due to data which identifies site details and locations]



# 6 Landscape analysis and predictive modelling

### 6.1 **Preamble**

The nature of Aboriginal land use patterns prior to European colonisation has largely been reconstructed through analysis of archaeological site distributions and ethnographic studies. Other sources used include observations made by early European settlers and environmental information known about available natural resources.

Aboriginal people in the arid zone in the past employed mobile semi-sedentary subsistence strategies. As such, it is likely that they would have moved across the landscape between resources more frequently than today. Land-use would have been impacted by climatic fluctuations with refuge areas occupied intensely during period of climatic amelioration and barrier/corridor landscapes occupied intermittently during better climatic conditions.

Site types would be influenced by the local environment, for example rock shelter and rock art sites are likely to occur where the necessary geology exists. Another important influence on site distribution is the location of current and former watercourses and the availability of water throughout the year. Artefact scatters are common indicators of activity in the landscape and may comprise evidence of previous campsites (which may have high densities of artefacts) or opportunistic knapping events or hunting activities (which may have low densities of artefacts). Artefact densities may be predicted based on distance to known reliable water sources and raw material sources.

Site preservation over time is an important factor in any attempt at archaeological predictive modelling. Site preservation can be influenced through natural processes such as erosion, wind and flooding as well as anthropogenic activities such as excavation of the ground surface or construction of structures.

The predictive model proposed for this assessment comprises a series of statements about the nature and distribution of evidence of Aboriginal land use that is expected within the Study Area. Archaeological predictive mapping incorporates spatial data such as elevation, slope, vegetation, hydrology and geology to support these statements.

### 6.2 Aboriginal archaeological predictive statements

[This section has been amended. The final bullet point provides a consolidated public version of key information with culturally confidential details excised]

The predictive statements are as follows:

- Stone artefact scatters are ubiquitous across the region and it is expected that this site type would be the most frequent within the Study Area.
- Artefact densities are expected to vary according to distance from creeks, aquifers and raw material sources within the study area. Greater artefact densities are likely to occur closer to water sources and raw material sources.
- Raw materials identified are likely to consist of silcrete, quartz, cherts and mudstones. Raw material sources such as quarries would be associated with outcrops of the underlying geology and these would be more probable to occur in association with the Wilpena Group in the eastern portion of the study area than the alluvial plains that comprise the majority of the Study Area.



- Archaeological investigations of lunettes (crescent-shaped sand dune formations) to the south of the Study Area identified stone artefacts eroding out of the surface and shallow archaeological deposits generally devoid of cultural material. The natural processes of wind and water movement have the potential to expose and cover Aboriginal campsites. Therefore, where dune features occur in the study area, these are likely to be archaeologically sensitive and artefact scatters and hearths may be identified.
- Rock shelters would likely occur in association with the Wilpena Group in the eastern portion of the Study Area. Where these rock shelters contain a relatively flat base and suitable opening they may contain potential archaeological deposits (PADs) associated with human occupation.
- Rock art sites comprising painted art and engraved art have been recorded within the Flinders Ranges. There is a likelihood that these site types would occur in association with the Wilpena Group in the eastern portion of the Study Area where suitable rock faces and panels are identified.
- Grinding groove archaeological sites would likely be identified in association with rock shelters or where suitable rock surfaces occur near watercourses. Mullers and basal grinding stones may be identified in conjunction with artefact scatters.
- Scarred trees are known to occur in the region and it is likely that were mature suitable trees occur within the Study Area cultural scarring or marking may be identified.
- Ethnographic studies have described the location of ceremonial sites and song cycles in association with important travel and trade routes. Where a route may intersect the Study Area there is potential for additional song lines or cycles and sites associated with the Dreaming to be identified

### 6.3 Landscape analysis

The landscape analysis undertaken for the development of the predictive model is based on the LiDAR data collected for the Study Area, observations in the field, background research and community consultation. The LiDAR data collected was used to create accurate models for the Study Area landscape. The models created include:

- Digital Elevation Model (DEM)
- Canopy Height Model (CHM)
- Slope
- Aspect

Datasets for drainage and contours as well as orthographic imagery for the Study Area was also collected. The predictive mapping developed for this assessment combine the predictive statements above with the LiDAR spatial data. Constraints for certain site types were identified and converted into Boolean queries that were applied to the data. The following four maps present the results of the predictive mapping for artefact scatters, grinding grooves, rock shelters and scarred or carved trees. (Figure 6.1 to Figure 6.4). For sites types where distance to water is a strong influence on the potential to identify sites in the landscape grades of potential from low to high were identified. This is applicable to artefact scatters and grinding grooves (Figure 6.1 and Figure 6.2). The predictive assumptions used for the artefact scatters were as follows:

- Landscape features such as dunes have high potential for artefact scatters on the surface and in subsurface deposits.
- There is moderate to high potential for artefact scatters to be identified within 500 metres of a watercourse.
- There is moderate potential for artefact scatters to be identified within two kilometres of a watercourse.



• There is low potential for artefact scatters to be identified further than two kilometres of a watercourse.

The predictive assumptions used for grinding grooves were based on the importance of water in this activity. The assumptions were as follows:

- There is high potential to identify grinding grooves within 20 metres of a watercourse.
- There is moderate potential to identify grinding grooves within 50 metres of a watercourse.
- There is low potential to identify grinding grooves further than 50 metres of a watercourse.

For sites where distribution is tied to a specific environmental factor such as underlying geology (rock shelters, rock art or quarries) or presence of trees (scarred or carved trees) the grading of potential has not been attempted (Figure 6.3). The predicted location for rock shelters, rock art and quarry site types was identified based on the combination of the predictive assumptions below. The areas highlighted in Figure 6.3 are those that satisfy all three conditions.

- There is high potential for rock shelters, rock art sites and quarry sites to be identified where the Wilpenna Formation occurs in the study area.
- There is high potential for rock shelters, rock art sites and quarry sites to be identified where the slope of the landform does not exceed 30 degrees.
- There is high potential for rock shelters, rock art sites and quarry sites to be identified within 100 metres
  of a watercourse.

The predictive location of scarred trees was identified based on the assumption that only mature trees would feature cultural markings, and that the predominate species in the study area would be River Red Gums. Mature trees of this species are generally 30 metres and taller their distribution within the Study Area is shown in Figure 6.4.

 There is high potential for scarred or carved trees to be identified where trees of 30 metres or higher occur within the Study Area.

### 6.4 Conclusion

The predictive mapping compiled for this assessment provides a starting point for future archaeological assessments of the Study Area. Predictive models do not replace comprehensive archaeological survey, rather they aid in the formulation of effective survey strategies. The validity of this model would be tested during future archaeological assessments if Wallerberdina is chosen as a preferred site for the Facility. This would provide opportunities to further refine the model, predictive statements and assumptions that have informed it.



#### Figure 6.1 Artefact Scatter Site Predictive Model







#### Figure 6.2 Grinding Groove Site Predictive Model



PR138677

JOB REF:

RPS AUSTRALIA EAST PTY LTD (ABN 44 140 292 762) LEVEL 13, 255 PITT STREET SYDNEY, NSW, AUSTRALIA 2000 T: 02 8270 8300 F: 02 9248 9810 www.rpsgroup.com.au

![](_page_52_Picture_5.jpeg)

creativepeople making a difference

![](_page_52_Picture_7.jpeg)

![](_page_53_Picture_1.jpeg)

### Figure 6.3 Rock Shelter, Rock Art and Quarry Site Predictive Model

![](_page_54_Figure_0.jpeg)

PR138677

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RPS AUSTRALIA EAST PTY LTD (ABN 44 140 292 762) LEVEL 13, 255 PITT STREET SYDNEY, NSW, AUSTRALIA 2000 T: 02 8270 8300 F: 02 9248 9810 www.rpsgroup.com.au

![](_page_54_Figure_3.jpeg)

![](_page_54_Figure_4.jpeg)

### VERSION (PLAN BY): A A3 (claire.rayner)

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![](_page_54_Picture_7.jpeg)

creativepeople making a difference

![](_page_54_Picture_9.jpeg)

![](_page_55_Picture_1.jpeg)

#### Figure 6.4 Scarred or Carved Tree Site Predictive Model

![](_page_56_Figure_0.jpeg)

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![](_page_56_Picture_5.jpeg)

creativepeople making a difference

![](_page_56_Picture_7.jpeg)

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# 7 Cultural heritage site visit

[Statements which identify the details or location of Aboriginal sites and places have been redacted or amended in this section]

### 7.1 **Preamble**

The purpose of the site visit was to identify key constraints and areas of cultural significance through discussions on Country with HWG representatives who have been elected to represent the wider community.

The cultural heritage site visit targeted:

- Project Areas East and West, including the three areas identified by Geoscience Australia as potential locations for the Facility.
- Areas of potential cultural heritage value identified based on desktop research, consultation, LiDAR data and landscape mapping.

Preliminary consultation with the HWG identified that it was important to the HWG that the fieldwork program was not rushed. As such, five days of fieldwork was allotted, in order to ensure ample time to discuss cultural heritage values and the project. All members of the HWG were invited to attend the site visit, both in person during the second HWG meeting and through follow up phone calls and emails.

It is important to recognise that neither tangible or intangible Aboriginal heritage sites occur in isolation. Context and connection to the wider spiritual landscape is integral to understanding sites and this concept was reiterated by HWG members during discussions on site. As such, some field data from locations outside the Study Area (such as Hookina Springs and Hookina Cemetery) have been included where this data provided meaningful context to this assessment.

### 7.2 Observations

### General

The Study Area predominately encompasses low lying flood-prone washout areas and discreet dune formations. Gently undulating hills are located to the east. Low shrubland vegetation typical of the Australian arid zone was observed throughout the Study Area. This provided wide vistas across the Study Area from high vantage points. Fauna observed within the area consisted of kangaroos, wallaroos, goats, emus, wild horses and cattle. Disturbance caused by horses and cattle was observed in most areas visited and generally considered to be superficial in nature. Other sources of disturbance observed were associated with the construction of roads and a rail line through the Study Area. Disturbance associated with high intensity flooding events was observed within the Study Area and in the surrounding area. Large trees outside the southern extent of the Study Area indicate the force and power of these events (Plate 7.1). Members of the HWG recounted the intensity of the 1955 floods which washed away the Hookina Township and the more recent 2007 floods.

![](_page_58_Picture_1.jpeg)

### Plate 7.1 Flood affected tree adjacent Hookina Creek. View south-east.

![](_page_58_Picture_3.jpeg)

Plate 7.2: Sand dune formation located along south eastern side of Project Area East view north west

![](_page_58_Picture_5.jpeg)

![](_page_59_Picture_1.jpeg)

### **Project Area West**

Project Area West is located across a floodplain, approximately 1.3 kilometres to the north west of the junction of Lake Torrens Homestead Road and the now decommissioned railway which runs approximately south-southwest north-northeast through the Study Area (Plate 7.3, Plate 7.4). Lake Torrens Homestead Road runs approximately north-west to south-east through Project Area West. Some sand dunes occur within the Project Area West however the majority of the area is characterised as flat "blue brush" country (Plate 7.3).

Project Area West appears largely undisturbed, however superficial disturbance as a result of livestock movement, the construction of formal roads, informal vehicle tracks, and the installation of infrastructure such as fencing, windmill powered bores and utility poles was noted.

### Plate 7.3 Project Area West – view north east from Lake Torrens Homestead Road. Note the sparse low shrub.

![](_page_59_Picture_6.jpeg)

![](_page_60_Picture_1.jpeg)

![](_page_60_Picture_2.jpeg)

Plate 7.4: Project Area West – view north-north east towards Wilpena Pound. Ground surface following removal of control point.

### Geoscience Australia 100ha Proposed Sites (GA1 and GA2)

There are two Geoscience Australia 100ha Proposed Sites located within Project Area West (GA1 & GA2). Both GA1 and GA2 are located across a slight rise on the surrounding floodplain. Both sites feature minimal superficial disturbance associated with livestock moment and informal vehicle tracks. Significant views and vistas were identified to and from Wilpena Pound to the north east, the Three Sisters mountain range to the south east, and the Yappala Ranges also to the south east (Plate 7.5 and Plate 7.6).

The location of GA2 is immediately adjacent Lake Torrens Homestead Road. Lake Torrens Homestead Road is considered significant for ongoing cultural practices and travel north and south via Wallerberdina. Members of the HWG present during the site inspection commented that this access should be maintained if this location were selected for the Facility.

![](_page_61_Picture_1.jpeg)

### Plate 7.5 GA2 – view east towards Wilpena Pound and the Flinders Ranges.

![](_page_61_Picture_3.jpeg)

Plate 7.6 GA2 – view east towards Flinders Ranges.

![](_page_61_Picture_5.jpeg)

![](_page_62_Picture_1.jpeg)

### **Project Area East**

Project Area East is approximately three kilometres to the north east of the junction of Lake Torrens Homestead Road and the now decommissioned railway located within the Study Area. Access to Project Area East is via a vehicle track running parallel to the railway. As with Project Area West, Project Area East encompasses a flood plain landform. Observed disturbance was primarily associated with livestock movement and was superficial in nature. Some infrastructure associated with pastoral land uses such as fencing, windmill powered bores and utility poles were noted as well as disturbance and localized modification associated with the decommissioned railway (Plate 7.7).

## Plate 7.7 Disturbance and leftover materials associated with construction of the railway in Project Area East.

![](_page_62_Picture_5.jpeg)

![](_page_63_Picture_1.jpeg)

Plate 7.8: Project Area East, undulating hills in background. Aspect east.

![](_page_63_Picture_3.jpeg)

### Geoscience Australia 100ha Proposed Site (GA3)

The Geoscience Australia 100ha Proposed Site (GA3) in Project Area East is located across a slight rise on a floodplain (Plate 7.9). GA3 remains largely undisturbed, however superficial disturbance as a result of livestock movement and informal vehicle tracks was discrete and localised. The tops of the Three Sisters mountains and Yappala Ranges were visible to the south east from the Project Area. An unobstructed view of Wilpena Pound is visible to the north east from the Project Area (Plate 7.10).

![](_page_63_Picture_6.jpeg)

![](_page_64_Picture_1.jpeg)

Plate 7.9 GA3 – view south across Project Area East

![](_page_64_Picture_3.jpeg)

Plate 7.10 GA3 - view north west towards Wilpena Pound

![](_page_64_Picture_5.jpeg)

![](_page_65_Picture_1.jpeg)

# 7.3 Surrounding areas of cultural significance outside of the study area

This section presents a discussion of areas of cultural significance included that are located outside of the Study Area. These areas were included in the cultural heritage site visit to give context for the cultural significance of the landscape as a whole at the request of the HWG representatives present.

### **Hookina Creek**

Hookina Creek runs approximately north west – south east along the western border of the Study Area. The creek line is not located within Project Area East or West.

[Cultural significance is attributed to Hookina Creek]

Plate 7.11 Deeply incised bend in Hookina Creek outside of the Study Area, adjacent old Hookina township, view west

![](_page_65_Picture_8.jpeg)

![](_page_66_Picture_1.jpeg)

![](_page_66_Picture_2.jpeg)

Plate 7.12 Hookina Springs, outside of the Study Area – view north-east towards windmill powered bore

### Cemetery, Former Hookina Township and flood affected trees

A small cemetery is located approximately 10 kilometres south east of the Study Area, accessed off Yappala Road (Plate 7.13). Former Hookina township and trees affected by the 2007 flood are located on the banks of Hookina Creek, approximately nine kilometres south east of the Study Area at the junction of Neuroodla and Lake Torrens Homestead Road (Plate 7.14). Fragments of ceramics and household wares were noted embedded in the banks of creek and were evident across the location (Plate 7.15). A disused bullock cart was also identified within this area (Plate 7.16).

Cumulatively, these sites and features give context to the Study Area, providing evidence for weather events and changing occupation of the local area. A photo record of each of the graves in the cemetery is included in Appendix C. If Wallerberdina is identified as a preferred location for the Facility, records of burials at the cemetery of former Hookina township may assist in historical research for the technical assessments.

![](_page_67_Picture_1.jpeg)

Plate 7.13 Cemetery located south east of the Study Area. View north-west towards Mt Eyre.

Plate 7.14 Former Hookina township ruins outside of the Study Area. View east.

![](_page_67_Picture_5.jpeg)

![](_page_68_Picture_1.jpeg)

![](_page_68_Picture_2.jpeg)

Plate 7.15 Broken cologne bottle located near ruins identified outside of the Study Area.

Plate 7.16 Disused bullock cart, outside of the Study Area. View north-west towards Mt Eyre.

![](_page_68_Picture_5.jpeg)

![](_page_69_Picture_1.jpeg)

### Figure 7.1 Areas of cultural significance outside of the Wallerberdina Study Area

[Figure redacted due to data which identifies site details and locations]

![](_page_70_Picture_1.jpeg)

### Figure 7.2 Areas of cultural significance outside of the Wallerberdina Study Area

[Figure redacted due to data which identifies site details and locations]

![](_page_71_Picture_1.jpeg)

### 7.4 Summary of site inspection results

Low levels of disturbance and modification were observed in the Study Area. Disturbance was primarily associated with livestock movement and was superficial in nature. Varying levels of environmental disturbance associated with water movement and erosion are present across the study area. Discreet, localised areas of disturbance and modification were observed, associated with vehicle tracks, the railway and installation of agricultural infrastructure.

During the site inspection participating members of the HWG provided information relating to their knowledge of the area as well as their personal experiences and connection to the Study Area.

### 7.5 Summary

It is clear from discussions with the HWG that the Study Area does not exist in a vacuum and that the cultural significance of the area should be interpreted as part of a wider spiritual and physical landscape which is imbued with meaning. Whilst differing opinions and accounts were gathered as to what constituted the significance of some areas of the Study Area, the overall importance of those areas was generally agreed upon. Based on discussions during the site visit and after with the HWG members present the following areas were identified as highly important and/or significant:

As a result of consultation conducted for this assessment and following the site visit, it is evident that there are numerous sensitive Aboriginal cultural heritage sites located adjacent to and within with Project Area East. As such, the Department has determined that Project Area East will no longer be considered as a potential location for the Facility.


### 8 Cultural significance assessment

#### 8.1 **Preamble**

Aboriginal heritage is an important part of Australian heritage. In order to develop appropriate heritage management outcomes, it is necessary for the significance of places to be assessed in line with the relevant legislation and guidelines. As per the Ask First guide, cultural significance will be determined by with the Adnyamathanha Traditional Owners, represented in this assessment by the HWG, before decisions can be made regarding the management of places and heritage values.

The purpose of this Section is to outline an assessment criteria and identify areas of Aboriginal cultural heritage value within the Study Area, based on consultation and site visit with the HWG.

#### 8.2 Assessment criteria

The cultural significance assessment criteria adopted for this assessment has been compiled in accordance with the *Burra Charter: the Australia ICOMOS Charter for Places of Cultural Significance* (Australia ICOMOS 2013) (the Burra Charter), the EPBC Act and the *Aboriginal Heritage Act 1988*.

Section 528 of the EPBC Act defines heritage value as:

"[the] heritage value of a place includes the places natural and cultural environment having aesthetic, historic, scientific or social significance, or other significance, for current and future generations of Australians"

Under this definition the heritage values of a place may include listed values included on the WHL or NHL or unlisted values and both are considered to be part of the 'Environment' under the EPBC Act. Heritage values of a place should also consider the surrounding natural and cultural environment of a particular place. Heritage values may include less tangible qualities such as visual values and cultural values.

The Burra Charter (Australia ICOMOS 2013:2) defines cultural significance as:

Cultural significance means aesthetic, historic, archaeological, social or spiritual value for past, present or future generations. Cultural significance is embodied in the place itself, its fabric, setting, use, associations, meanings, records, related places and related objects.

Cultural significance may exist in objects at a place or associated with it, in other places that have some relationship to the place and in the activities and traditional and customary practices that may occur at the place or that are dependent on the place. Cultural significance may be comprised of multiple aspects and qualities which may or may not be interdependent.

The cultural significance assessment for the Study Area will be conducted according to the criteria laid out in the Burra Charter. Indigenous heritage values of a place may not be easily categorised into the Burra Charter criteria. For example the value and meaning of a place may be the source of and underpin fundamental aspects of a groups identity, purpose, meaning, cultural obligations or practices. Therefore, it is an important aspect of the cultural heritage assessment process that Aboriginal people are the primary determinants of cultural heritage significance.



#### Table 8.1 Cultural significance criteria

Value	Description
Aesthetic Value	Refers to the sensory and perceptual experience of the place, it may consider form, scale, colour, texture and material of the fabric or landscape and the smell and sounds associated with the place and its use.
Historic Value	Refers to the associations of a place with a historically important person, event, or activity in the Aboriginal community, these values may not always have physical evidence of their historical importance.
Scientific Value	Refers to the information content of a place and its ability to reveal more about an aspect of the past through examination or investigation of the place. Also refers to the importance of a landscape, area, place or object because of its rarity, representativeness and the extent to which it may contribute to further understanding and information.
Social Value	Refers to the associations that a place has for a particular community or cultural group and the social or cultural meanings that it holds for them.
Spiritual Value	Refers to the intangible values and meanings embodied in or evoked by a place which give it importance in the spiritual identity, or the traditional knowledge, art and practices of a cultural group. Spiritual values are often recognised as a component of Social values and Spiritual values may be interdependent on the Social values and physical properties of a site.
	Spinitual values can only be identified through consultation with Abonginal people.

#### 8.3 Cultural significance of the Study Area

The desktop research, consultation with the HWG and site visit have identified a number of areas within the Study Area that are considered to be of cultural significance.

[Text and a table from this section has been redacted due to confidential cultural information identifying areas of cultural significance. Areas of cultural significance identified in this assessment were not located within Project Area West]



#### Figure 8.1 ACHAR findings

[Figure redacted due to data which identifies site details and locations]



# 9 Heritage impact assessment

#### 9.1 **Preamble**

The aim of a heritage impact assessment is to gauge the potential for a project to cause harm to or diminish heritage values. The impact assessment will inform the next stages of the site selection process. In general, conservation of Aboriginal sites and areas of cultural or archaeological significance is the preferred heritage outcome. Where this is not feasible, management and mitigation measures would need to be formulated in consultation with the Adnyamathanha community to minimise the potential harm.

This impact assessment has been compiled to inform the current phase of the site selection process for the Wallerberdina. Statements made regarding potential impacts associated with the proposed Facility are made on the assumption that these general impacts may occur if the Study Area is selected as a preferred site for the Facility. Specific and cumulative impacts entailed by construction and operation of the Facility at Wallerberdina would be assessed during the technical investigation phase and would require designs for the Facility and information regarding ancillary proposed works.

#### 9.2 Assessment framework

The heritage impact assessment allows examination of the harm associated with a proposed activity and of the potential effects on Aboriginal objects, places and sites. This also includes the extent to which the development or activity will change the surrounding landscape setting. The extent and consequence of harm to Aboriginal heritage is informed by the significance assessment completed previous. Harm may be assessed to be direct or indirect.

The impact assessment informs:

- An understanding of the cumulative impact of the proposal; for example the nature and extent of the Aboriginal place or site, significant area or views and vistas proposed to be harmed in relation to other identified sites in the region.
- Ascertaining how, where practicable harm to significant Aboriginal places or sites can be avoided.
- Establishing and assessing the risks and consequences of the potential locations of the Facility in the Study Area.
- Assessing the costs and benefits of the Facility for future generations.

#### 9.3 **Preliminary impact assessment**

This assessment considers the potential impacts associated with the location of the Facility within Project Areas East and West only. This assessment has identified areas of cultural significance, significant views and vistas and areas of high archaeological potential within Project Areas East and West. This is based on desktop research, consultation with the HWG, landform analysis and predictive mapping. The location of the Facility should aim to avoid or minimise impacts to those areas if the Study Area is selected as a preferred site. A site analysis for each proposed Geoscience Australia 100ha site is provided based on this preliminary impact assessment.

#### Table 9.1 Heritage impact assessment

[Table redacted due to data which identifies site details and locations]



#### Figure 9.1 Preliminary heritage impact

[Figure redacted due to data which identifies site details and locations]



#### 9.4 Geoscience Australia proposed 100ha sites – analysis

[Texts and tables which identify the details or location of Aboriginal sites and places have been redacted or amended in this section]

A number of culturally significant areas, sites and views and vistas were identified during the site inspection.

At this stage of the assessment the potential impact to these items is largely unknown. Comprehensive anthropological, archaeological survey, recording and analysis would be required to understand the significance of these items and the potential impacts associated with the Facility.

#### Discussion

This site analysis has considered the results of the archaeological predictive mapping and cultural values identified during through consultation with the HWG. The cultural values identified for each Geoscience Australia proposed site have not been fully recorded at this stage and therefore potential impacts to these values are indicative only.

#### GA1

The Department has indicated that there is scope to move this 100 hectare area in order to minimise impact to heritage values. As such, potential impacts associated with a relocation option for GA1 have also been considered (See Figure 9.5 for relocation options). Based on the archaeological predicative mapping for Project Area West, if GA1 was relocated approximately 450 metres west the potential impacts to areas of cultural significance may still apply, however it would reduce potential impacts to archaeology identified through predictive mapping and landscape analysis.

#### GA2

The Department has indicated that there is scope to move this hectare area in order to minimise impact to heritage values. As such, potential impacts associated with a relocation option for GA2 have also been considered (See Figure 9.5 for relocation options).Based on the archaeological predicative mapping for Project Area West if GA2 was relocated approximately 180 metres to the north, the potential impacts to areas of cultural significance still apply, however, it would reduce impacts to archaeology identified through predictive mapping and landscape analysis. Relocation of GA2 as suggested in Figure 9.5 would avoid potential impacts to areas of high archaeological potential.

#### GA3

Based on the archaeological predictive mapping GA3 contains the most archaeological constraints. The location of the proposed Facility in this location could cause direct and indirect impacts to areas of high archaeological potential.

During the course of this assessment, and as a direct result of preliminary findings identifying numerous heritage constraints with regard to GA3, the Department have eliminated GA3 as a potential location for the Facility.



#### Figure 9.2 Archaeological predictive mapping: GA1



REPORT



#### Figure 9.3 Archaeological predictive mapping: GA2



REPORT



#### Figure 9.4 Archaeological predictive mapping: GA3





Figure 9.5 Potential relocations for GA1 and GA2 [Figure amended to remove confidential site data]





# 10 Management and mitigation of potential impacts

#### 10.1 **Preamble**

This section considers the key opportunities and risks associated with the selection of the Study Area as a preferred site. It also details the framework for mitigation and management measures that would minimise and/or avoid potential impacts to Aboriginal heritage within the Study Area. The overall guiding principle for cultural heritage management is that where possible Aboriginal sites should be conserved. If conservation is not practicable, measures should be taken to mitigate against impacts to Aboriginal sites and places.

There is opportunity throughout the life of the project to avoid direct impact and minimise indirect impact to Aboriginal heritage and directly involve the Adnyamathanha community in the decision-making processes. If the Study Area is chosen as a preferred site, opportunities exist to involve the Adnyamathanha community in all stages of the project as the primary custodians of their cultural heritage.

It should be reiterated that potential impacts to areas of high cultural significance to Adnyamathanha people constitute major risks if the recommended avoidance, mitigation or management policies are not put in place. Any potential impacts to these areas would require particular consideration of Adnyamathanha Traditional Owner comments and assessment against the EPBC criteria.

#### 10.2 Key opportunities and risks identified

[This section has been amended. The first two bullet point provide consolidated public versions of key information with culturally confidential details excised]

This assessment has identified key opportunities and risks if the Study Area is selected as a preferred site. Key opportunities may be incorporated in the early environmental assessment and design phase to minimise and avoid potential impacts to Aboriginal heritage values. Potential risks to the project exist where they are not avoided or mitigated according to the recommendations of this ACHAR.

- Potential for proposed facility locations to encroach on areas of high archaeological and / or cultural heritage significance is a key risk.
- Potential risk for proposed facility locations to impact identified significant views and vistas associated with a previously recorded song line located partially within the Wallerberdina Study Area is a key risk
- Potential risks have been identified for proposed facility and associated infrastructure to cause harm to tangible and intangible heritage.
- Key opportunities exist to involve the Adnyamathanha community in all future stages of the project, providing training for younger members of the community on Country and recording oral histories and accounts that may not have otherwise been recorded.
- A key opportunity exists to consider land access agreements in the initial stages of the project to ensure the Adnyamathanha community have access to and through any proposed Facility locations.
- Key opportunities exist to create employment opportunities for the local Adnyamathanha community not just during construction but also during the operational phase. Long term education and training opportunities for the Adnyamathanha community could be created in tandem with the Project.
- Key opportunities exist to involve local Adnyamathanha artists and community in the aesthetic design of the Facility and to consult with the local community in regard to colours, materials, embellishments and

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cultural plantings to ensure the Facility is sympathetic to the local landscape and the Adnyamathanha people as Traditional Owners of the area.

#### **10.3** Guiding mitigation and management principles

Recommendations regarding management and mitigation of potential impacts have been developed in consultation with the HWG and in consideration of the relevant legislation and guidelines. The following principles provide management and mitigation measures that encompass the management of heritage values within the Study Area as well as opportunities for the Adnyamathanha community to engage with and be involved in the development of detailed designs and operation of the Facility.

Management and mitigation measures provided for cultural areas and areas of archaeological potential are dependent on the values identified and the nature of the potential risk or impact to that site. As such the recommendations regarding management and mitigation of potential impacts identified in this report are based on the preliminary identified Aboriginal heritage impacts and the predictive mapping prepared for this assessment. These measures would be further refined as the study progresses and as the impacts associated with the Facility are further defined.

In addition to the key recommendations outlined in Section 11 below, detail of triggers for management and mitigation measures based on LiDAR results and archaeological predictive modelling are outlined here:

#### Management and mitigation measures - zones of archaeological potential

The following mitigation and management principles should be implemented during the site selection phase.

The landscape analysis compiled for this assessment identified the potential for Aboriginal sites types to be located within the Study Area. Areas of high, moderate to high, moderate and low potential were identified across the Study Area. Based on this assessment guiding management and mitigation principles are provided to minimise impacts to these zones and where possible avoid impacts to these zones. Based on this assessment and mitigation principles are provided to minimise impacts to these zones and where possible avoid impacts to these zones. Based on this assessment a number of guiding management and mitigation principles are provided to minimise impacts to these areas and where possible avoid impacts to these areas. Where impacts cannot be avoided, next steps are recommended to ensure that the impacts are appropriately mitigated.

[Specific recommendations were provided to the Department in this section categorised by zones of archaeological potential. This section has been redacted due to culturally confidential details of archaeological site types, however, these recommendations are reflected in the general recommendations made in Section 11.2 below]



# 11 Conclusion and recommendations

During the preliminary stages of consultation for this assessment and following the site visit, it became evident that there were numerous sensitive Aboriginal cultural heritage sites located adjacent to and within with Project Area East. As such, the Department determined that Project Area East would no longer be considered as a potential location for the Facility. Project Area East is assessed and discussed in this report, however, the following findings and recommendations therefore focus on Project Area West.

#### 11.1 Key findings

[This section has been amended. The first two bullet points in each section provide consolidated public versions of key information with culturally confidential details excised]

Key findings regarding Project Area West are:

- The Department is aware of the archaeological potential of certain landforms. Further, non-invasive investigation would be required to determine if archaeological constraints exist and to make recommendations regarding avoidance or mitigation of potential impacts
- The Department is aware of the potential for culturally significant sites to occur, this would require further consultation with the Adnyamathanha community to identify
- Adnyamathanha people have a strong and ongoing connection to Country and this is exemplified by the intangible and tangible heritage values associated with the Flinders Ranges
- Access along Lake Torrens Homestead Road in and out of Wallerberdina and Project Area West is important to members of the HWG present during the site visit. Adnyamathanha people maintain hunting and gathering activities in the region and these activities are considered important in Adnyamathanha cultural and social life

A number of Aboriginal heritage values were identified outside of Project Area West, within and surrounding the wider Study Area. Location of the proposed facility within Project Area West presents an opportunity to avoid impact to these values, which include:

- A registered song line and associated archaeological site
- Hookina Creek

Should Project Area West be selected to host the NRWMF, key opportunities exist to involve the Adnyamathanha community in all future stages of the project, providing training and employment on Country. Additional opportunities exist to record oral histories and accounts that may not have otherwise been recorded, and to involve local Adnyamathanha artists in the aesthetic design of the Facility. Consideration could be given to colours, materials, embellishments and cultural plantings that ensure the Facility is sympathetic to the local landscape and the Adnyamathanha people as Traditional Owners of the area.

#### 11.2 Recommendations

#### Ongoing (applicable to all phases of Project)

**Recommendation 1 - Activity within the Study Area** 

 All Department staff or Project contractors that require access to the Study Area should be escorted by a male and female member of the Adnyamathanha community for protection of Aboriginal heritage and also for the spiritual protection of staff and contractors. This measure should apply to the site selection



phase and technical investigation phase. During the construction phase and / or operational phase it is likely that Adnyamathanha monitors would be more appropriate on an ad-hoc basis, this would be refined in consultation with the Adnyamathanha community.

- Access to Lake Torrens Homestead Road and the Study Area should be maintained throughout the life of the Project if the Study Area is selected as a preferred site. This is considered important for ongoing cultural practices of hunting and gathering in the Study Area and travel to and from Lake Torrens and Cotabena.
- The Adnyamathanha community should be notified prior to any works undertaken within the Study Area. Nothing should be placed into the ground or left within the Study Area without prior consultation with the Adnyamathanha community. Specific recommendations around notification periods and frequency of notifications would be made in the Aboriginal Cultural Heritage Management Plan. During the current Site Characterisation phase, the HWG as a minimum should be notified as the elected representatives of the Adnyamathanha community.
- Any ground disturbance works including drilling associated with geotechnical investigations in areas that have not be subject to comprehensive archaeological survey should be avoided. Where these works cannot be avoided the proposed areas should be subject to targeted survey conducted by a qualified archaeologist and representatives of the Adnyamathanha community.
- A buffer of 500 metres either side of major creek lines should be maintained and no activity should occur within these buffered areas.

#### **Recommendation 2 - Consultation**

- Consultation with the HWG, in accordance with the consultation methodology described in this report, should be ongoing throughout the Site Characterisation phase. If Project Area West is selected to host the NRWMF, consultation with the Adnyamathanha community should continue for the life of the Project, facilitated by a qualified heritage consultant. Consultation during the operational phase should include a schedule of regular meetings each year to inform Adnyamathanha community of project developments. These regular meetings may involve an elected body of the Adnyamathanha community to disseminate information to the wider community. The set number of meetings each year should be decided in consultation with the Adnyamathanha community, however, the HWG have indicated that they have found three scheduled meetings each year to be effective on other projects.
- Representatives of the Adnyamathanha community should be provided the opportunity to participate in all archaeological and anthropological surveys that may be conducted. It is understood that these assessments would be carried out as part of technical investigations during the Site Selection phase.
- Senior cultural knowledge holders should be consulted. These knowledge holders may be identified through broad community consultation conducted during the Site Selection Phase.
- Consultation should extend to non-Adnyamathanha members of the local community who may hold knowledge relevant to the history of the Study Area. This is in accordance with the Commonwealth Ask First: A Guide to Respecting Indigenous Heritage Places and Values.
- All DIIS staff and contractors should acknowledge and respect Sorry Business and periods were the community may be grieving. Such periods may occupy most of the local community for an extended period as people travel for a funeral and/or visit family.

#### **Recommendation 3 - Cultural awareness training**

 It is understood that DIIS provides Cultural awareness training all DIIS staff and contractors involved in the Project. This training should be ongoing throughout the life of the project and outline heritage

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obligations of staff and contractors under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and the State *Aboriginal Heritage Act 1988*.

#### **Recommendation 4 – Aboriginal Cultural Heritage Management Plan**

An Aboriginal Cultural Heritage Management Plan (ACHMP) should be compiled based on the findings
of this ACHAR. This document would provide guiding principles to manage the cultural heritage values
and potential archaeological resource during the Site Selection Phase. This document would be revised
following technical cultural heritage investigation with the intent to guide the Site Selection and
subsequent phases of the Project.

#### Site selection phase

#### **Recommendation 5 – Technical investigations**

LiDAR analysis and archaeological predictive mapping prepared for this assessment has identified gradated zones of archaeological potential and sensitive landforms across the Study Area. Section 6 of this report identifies the zones of archaeological potential and sensitive landforms, and Section 10.3 of this report details management and mitigation measures for each zone. If Project Area West is selected to host the NRWMF, it is recommended that the management and mitigation measures outlined in Section 10.3 are employed, in addition to:

- Comprehensive archaeological survey of the preferred Facility location should be undertaken, with representatives of the Adnyamathanha community. This archaeological assessment would build upon on the findings of this ACHAR and adhere to the Aboriginal Cultural Heritage Management Plan It is recommended that the survey team includes Adnyamathanha community members with experience in archaeological survey and site recording, as well as trainees and members of the community that are acknowledged knowledge holders.
- The Department is aware of the archaeological potential of certain landforms. Further, non-invasive investigation, such as GPR, should be employed in order to determine if archaeological constraints exist and to make recommendations regarding avoidance or mitigation of potential impacts
- Technical investigations should consider cumulative impacts associated with proposed ancillary works required to support the Facility including construction and upgrade of roads, increased traffic volumes during construction and operational phases, as well as potential impacts to access to the Study Area for cultural activities.
- Technical investigations should include a detailed heritage visual impact assessment (VIA) should be undertaken to assess the potential impacts to views and vistas of areas of cultural heritage significance.

Additionally, all member of the HWG present for the site visit conducted as part of this assessment recommended that all participants in technical investigation surveys should undergo daily drug and alcohol testing.

#### **Construction and operational phase**

#### Recommendation 6 - Design principles, views and vistas

 The overall design of the Facility should aim to minimise impacts to the surrounding views and vistas two and from the selected site. Where opportunities exist colours, embellishments and materials should be selected in consultation with the Adnyamathanha community.



- Opportunities to involve Adnyamathanha artists in the design of murals for the external portions of the Facility should be explored.
- Options for cultural plantings should be developed in consultation with the Adnyamathanha community. Where possible options should be explored to select plantings that would aid the transmission of traditional knowledge as well as encouraging native species in the area and minimising visual impacts.

#### Recommendation 7 - Adnyamathanha employment and training opportunities

Long term employment and training opportunities for the Adnyamathanha community are considered of
vital importance to the HWG if the Study Area is selected as a preferred site. DIIS should consider and
clearly outline commitments to providing education, employment and training opportunities in
association with the Facility.

#### **Recommendation 8 - Consultation**

As outlined above in the ongoing recommendations section, consultation during the operational phase should include a schedule of regular meetings each year to inform Adnyamathanha community of project developments. These regular meetings may involve an elected body of the Adnyamathanha community to disseminate information to the wider community. The set number of meetings each year should be decided in consultation with the Adnyamathanha community, however, the HWG have indicated that they have found three scheduled meetings each year to be effective on other projects.



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# Appendix A Consultation Log

[REDACTED]



# Appendix B Written Consultation

[REDACTED]



# Appendix C

# Hookina Cemetery Photographic Record

[REDACTED]