



AMERGIN CONSULTING (AUSTRALIA) PTY LTD

ABORIGINAL HERITAGE • PROJECT MANAGEMENT

**Report of an Ethnographic Aboriginal Heritage Survey of the
Proposed NorthLink WA Project**

Part 2: Perth–Darwin National Highway

**Prepared for Main Roads Western Australia on behalf of Coffey
Environments Pty Ltd and BG&E Pty Ltd**

By Bryn Coldrick and Edward M. McDonald

May 2015

Disclaimers

The results, conclusions and recommendations contained within this report are based on information available at the time of its preparation. Whilst every effort has been made to ensure that all relevant data has been collated, the authors can take no responsibility for omissions and/or inconsistencies that may result from information becoming available subsequent to the report's completion.

This report may contain the names of people who have passed away. Please be careful when reading this report or showing it to others.

It should also be noted that this report offers independent heritage advice and recommendations to assist Main Roads WA in meeting its obligations under WA's *Aboriginal Heritage Act 1972* (AHA). This advice is based on the authors' own opinions, interpretations, knowledge and experience. The proponent should seek specialist legal advice, if required, regarding the AHA and the (Cth) *Native Title Act 1993*.

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Acronyms and Definitions

Aboriginal Site	A place to which the <i>Aboriginal Heritage Act (1972)</i> applies by operation of Section 5
ACMC	Aboriginal Cultural Material Committee
AHA (or “the Act”)	<i>Aboriginal Heritage Act (1972)</i> as amended
AHIS	Aboriginal Heritage Inquiry System
AIC	Australian Interaction Consultants
Amergin	Amergin Consulting (Australia) Pty Ltd
CMWG	Combined Metropolitan Working Group
DAA	Department of Aboriginal Affairs (formerly Department of Indigenous Affairs or DIA). Also referred to in this report as “the Department”
EPA	Environmental Protection Authority
IAEG	Independent Aboriginal Environmental Group
MRWA	Main Roads Western Australia
PDNH	Perth–Darwin National Highway
S18	Section 18 of the Act which provides the mechanism for a proponent to seek Ministerial consent to use land for a purpose which would otherwise be likely to result in a breach of S17
SAAS	Swan Area Archaeological Survey
SGH	Snappy Gum Heritage Services Pty Ltd
Study Area	The land shown in Figure 1 incorporating the TGS referral corridor as at 6 th February 2015
Survey Area	The TGS referral corridor as made available to Amergin at the time of the field surveys
SWALSC	South West Aboriginal Land and Sea Council
TGS	Tonkin Grade Separations
TPG	The Planning Group WA Pty Ltd
Whadjuk Protocol	Whadjuk Aboriginal Cultural Heritage Protocol, an agreement between SWALSC, DAA and MRWA regarding the conduct of heritage surveys

Executive Summary

This report presents the findings of an ethnographic survey of the Perth–Darwin National Highway (PDNH). The survey comprised both desktop research and an ethnographic field survey/consultations carried out in January and February 2015 with nominated Nyungar representatives, as required by the Whadjuk Protocol. The purpose of the survey/consultations was to identify any known or previously unreported ethnographic sites within the survey area that might reasonably be considered an Aboriginal Site under Section 5 of the *Aboriginal Heritage Act 1972* (AHA).

The key findings of the assessment are outlined in tabular form in Table 9. In short, the report concludes that it is likely that Section 18 consent will be required for works inside the boundaries of the following registered ethnographic sites:

- DAA Place ID 3692 '**Bennett Brook: In Toto**';
- DAA Place ID 20058 '**Temporary Camp**';
- DAA Place ID 21393 '**Lightning Swamp**'; and
- DAA Place ID 21620 '**Chandala Brook**'.

Section 18 consent may also potentially be required for Lodged place DAA Place ID 3525 '**Ellen Brook: Upper Swan**'.

It is considered unlikely that any of the newly reported ethnographic places/features would be considered Aboriginal Sites as defined by Section 5 of the AHA under the DAA's current assessment regime. However, MRWA is encouraged to avoid or mitigate impacts to these places/features where possible. Other controls (for example, environmental legislation) may exist to protect and/or manage some of these values, in particular the wetlands.

The Aboriginal consultants were satisfied with the process and findings of the archaeological survey which identified two previously unreported archaeological sites ('**NorthLink 14-01**' and '**NorthLink 14-02**') on the edge of the Study Area. One previously recorded place (DAA Place ID 21994 '**Neaves Road Creek Field Site 01**') was also found to lie outside the Study Area, though it is currently incorrectly mapped by the DAA as overlapping it (Hovingh & Ogilvie 2015). Further consultation should take place in the event that any of these sites needs to be impacted in the future.

With respect to the registered archaeological site DAA Place ID 3180 ('**Marshall, Beechboro**') and the Lodged artefact scatters (DAA Place ID 3618 '**Whitemans Cutting**' and DAA Place ID 3619 '**Whitemans Quarry**'), the Aboriginal consultants

acknowledged that these sites had been developed/destroyed and raised no particular concerns about further impacts from the PDNH.

Based on the findings of the ethnographic assessment, the following recommendations are made:

1. It is recommended that the proposed PDNH proceed subject to Ministerial consent under Section 18 of the AHA as required;
2. It is recommended that MRWA avoid impacting the places/features reported by the Aboriginal consultants wherever possible;
3. It is recommended that MRWA minimise impacts to native flora and that where possible significant plants such as native Christmas trees (*Moojarr*) and Morrison bushes should be relocated in consultation with the relevant Aboriginal people; and
4. It is recommended that MRWA note the concerns of the Aboriginal community in relation to the potential environmental impacts of the project, and that further information on these matters be provided to the relevant parties as requested.

Additional recommendations are made in the archaeological report in relation to the identification and management of known and potential archaeological sites and material, including burials (Hovingh & Ogilvie 2015).

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1. INTRODUCTION

1.1 Purpose of the Survey

Amergin Consulting (Australia) Pty Ltd (Amergin) was engaged by Coffey Environments Pty Ltd (Coffey) on behalf of the NorthLink WA Project to undertake Aboriginal and European heritage investigations in relation to the project.

NorthLink WA is a program of road projects proposed to be undertaken by MRWA that form vital components of a wider series of improvements to the Perth–Darwin National Highway (PDNH). The primary objective of these improvements is to enhance freight efficiency and productivity by reducing travel time and improving journey time reliability between the Perth metropolitan area and the Northwest of Australia. The Project comprises two constituent parts:

1. Tonkin Grade Separations (TGS) – the grade separation of the intersections of Tonkin Highway with Collier Road, Morley Drive and Benara Road, together with associated works; and
2. Perth–Darwin National Highway (PDNH) – a new 37km highway link between the junction of Reid Highway/Tonkin Highway and the Great Northern Highway/Brand Highway at Muchea.

The heritage investigations were undertaken in five broad phases:

1. A desktop assessment investigating the known and potential heritage constraints of the Project (Coldrick, Hovingh & McDonald 2014; TPG 2015);
2. An archaeological survey, as required by the 'Whadjuk Protocol', carried out by Snappy Gum Heritage Services (SGH) with Nyungar participants on behalf of Amergin in November/December 2014 (Hovingh & Ogilvie 2015);
3. An ethnographic survey and consultations, as required by the Whadjuk Protocol **and the DAA's Due Diligence Guidelines**, carried out by Amergin with the assistance of Ethnoscience and SGH with selected Nyungar representatives in January and February 2015;
4. European heritage investigations, carried out by The Planning Group (TPG) on behalf of Amergin with the assistance of SGH; and
5. Preparation of heritage approval applications where required.

This report presents the findings of the ethnographic survey of the PDNH which took place over two rounds of fieldwork: the first from 12–15th January 2015 and the second from 24–26th February 2015.

It should be noted that the Survey Area was based on the project boundaries available to Amergin at the time of fieldwork. Revised project boundaries were provided to Amergin in February 2015 after completion of the January fieldwork which differed from the previous datasets in some areas. These amendments do not affect the findings of the ethnographic survey. However, in this report we use

the term 'Survey Area' to refer to the dataset which was used in the field, and 'Study Area' to refer to the revised project boundaries (February 2015).

This report should be read in conjunction with the Aboriginal heritage desktop report (Coldrick, Hovingh & McDonald 2014) and the archaeological survey report for NorthLink (Hovingh & Ogilvie 2015).

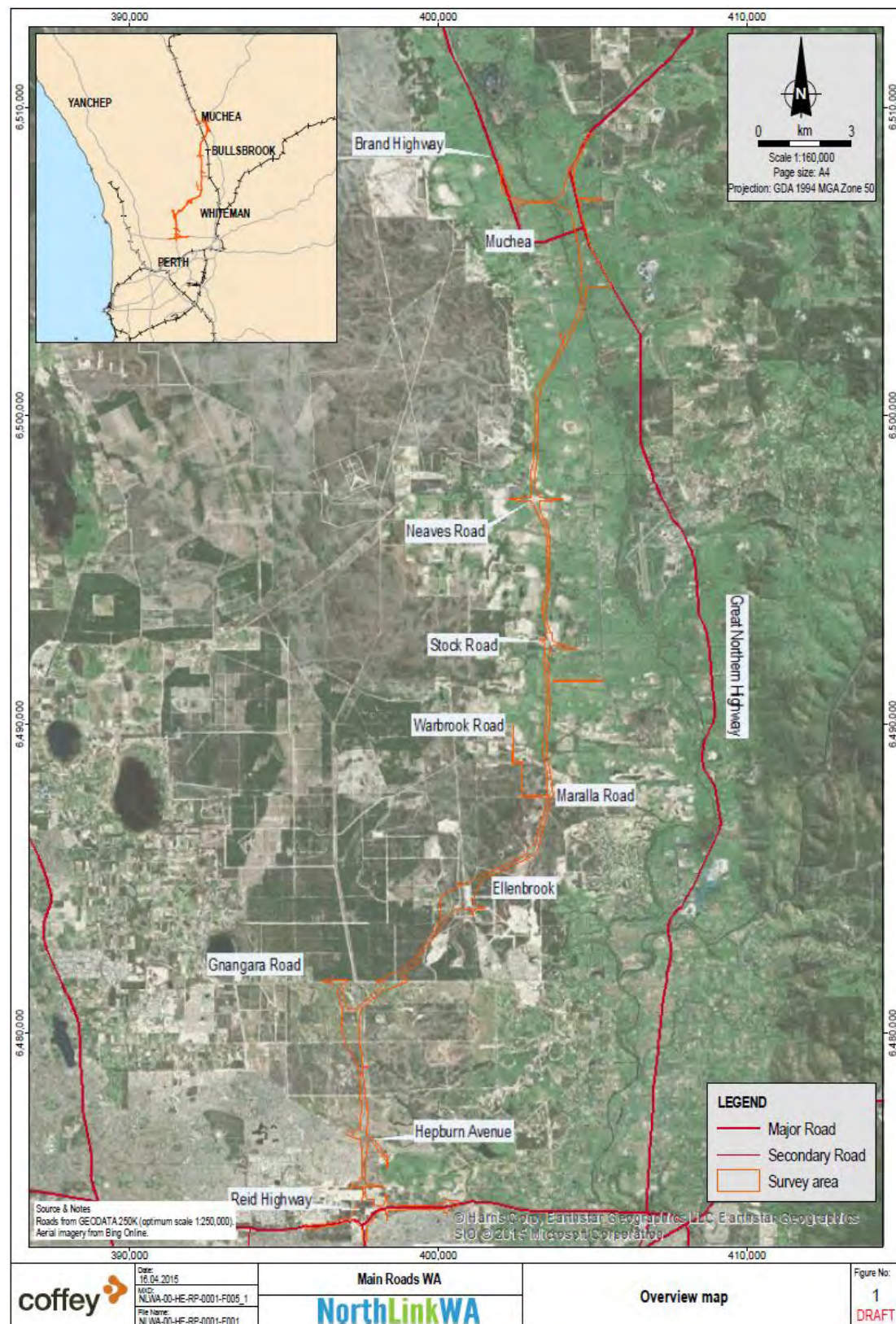


Figure 1: Overview map of the study area (Source: Coffey)

1.2 Legislative Context ¹

The *Aboriginal Heritage Act 1972* (AHA) provides for the preservation, on behalf of the community, of places and objects customarily used by or traditional to the Aboriginal people of Western Australia. Aboriginal Sites are places to which the Act applies by operation of Section 5 (outlined below) and are currently protected whether they are known to the Department of Aboriginal Affairs (DAA) or not.

Section 5 of the AHA defines an Aboriginal Site as follows:

- a. any place of importance and significance where persons of Aboriginal descent have, or appear to have, left any object, natural or artificial, used for, or made or adapted for use for, any purpose connected with the traditional cultural life of Aboriginal people, past or present;*
- b. any sacred, ritual or ceremonial site, which is of importance and special significance to persons of Aboriginal descent;*
- c. any place which, in the opinion of the Committee,² is or was associated with Aboriginal people and which is of historical, anthropological, archaeological or ethnographic interest and should be preserved because of its importance and significance to the cultural heritage of the State;*
- d. any place where objects to which the Act applies are traditionally stored, or to which, under the provisions of this Act, such objects have been taken or removed.*

Under Section 39(3), the AHA gives primacy to “associated sacred beliefs, and ritual or ceremonial usage, in so far as such matters can be ascertained” in the Aboriginal Cultural Material Committee’s (ACMC’s) evaluation of the importance of places and objects.

The State Government is currently proposing to amend the AHA and introduced the *Aboriginal Heritage Amendment Bill 2014* into the Legislative Assembly on 27 November 2014. Although many important sections of the Act (including Sections 5 and 17, outlined below) will remain essentially unchanged, the application of Section 5 is being increasingly restricted by the DAA through their administration and interpretation of the Act. The Department has recently introduced a set of ‘threshold criteria’ to assist in the interpretation of Section 5 and, in effect, to limit the application of the AHA.

¹ This section provides an overview of the main sections of the AHA and its current administration. We note, however, that we are not lawyers. The proponent should seek independent legal advice on any matters of concern in relation to the AHA and its operation.

² The Aboriginal Cultural Material Committee (ACMC) whose role it is, among other functions, to evaluate on behalf of the community the importance of places and objects and to advise the Minister. The *Aboriginal Heritage Amendment Bill 2014* is seeking to transfer the assessment function of the ACMC to the Chief Executive Officer (CEO) of the DAA.

Unauthorised disturbance of an Aboriginal Site is an offence under **Section 17** which states that:

*17. A person who -
excavates, destroys, damages, conceals or in any way alters any Aboriginal site; or,
in any way alters, damages, removes, destroys, conceals, or who deals with in a manner not sanctioned by relevant custom, or assumes the possession, custody or control of, any object on or under an Aboriginal site,
commits an offence unless he is acting with the authorisation of the Registrar under section 16 or the consent of the Minister under section 18.*

Based on our interpretation of this section of the Act, we generally advise our clients that where a place is a registered Aboriginal Site, or might reasonably be expected to constitute an Aboriginal Site, that they should not undertake any of the activities outlined above that might result in a breach of Section 17, and that they should apply for Ministerial consent under Section 18 to limit their potential liability under the Act.

Section 18 provides a mechanism for landowners and proponents to seek consent to use land that might contain an Aboriginal Site(s) (i.e., a place to which the Act applies), and in effect to disturb those sites, from the Minister of Aboriginal Affairs and thereby protect themselves from potential prosecution under Section 17. After considering the recommendations of the ACMC and **having regard to the “general interest of the community”**, the Minister may either consent to the use of the land for the purpose sought or refuse consent. Current advice from the DAA on the need or otherwise for Section 18 consent routinely makes reference to likely impacts on “heritage values” (which are not referred to in the Act). They also routinely advise proponents to apply the *Aboriginal Heritage Due Diligence Guidelines* (DIA 2013) so that they can determine whether their proposed activities have the potential to breach Section 17, and to seek advice from the Department where there is doubt.

Other State legislation, such as the *Environmental Protection Act 1986* (EP Act), can in some instances complement the AHA (for example, in cases where physical protection of the natural environment is required to protect sites of heritage significance) (EPA 2004). Aboriginal heritage can also be afforded protection by Commonwealth legislation, in particular the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984*. Aboriginal people who believe that a significant place or object is under threat and that State Government protection is

inadequate can apply to the Federal Environment Minister to protect the place or object.

1.3 Defining an 'Aboriginal Site'

In this report, we use the term 'Aboriginal Site' to refer to a place that the Aboriginal Cultural Material Committee (ACMC) has determined to be an 'Aboriginal Site' within the meaning of Section 5 of the AHA and is therefore 'registered'. Under Section 4, any *place* to which the Act applies is an Aboriginal Site.³ While other places and objects may be *listed* on the AHIS and in other sources, this does not necessarily mean they are Aboriginal Sites. Indeed, many places and objects listed on the AHIS are in fact not Aboriginal Sites for the purposes of the AHA.⁴

For example, there are places and objects within the system that are referred to as 'Other Heritage Places'.⁵ Such places and objects may either be 'Lodged' on the system (which generally occurs following initial reporting of the place or object to the DAA and prior to assessment by the ACMC) or for which it has been determined that there is insufficient information available to allow the ACMC to determine whether or not they are Aboriginal Sites. However, as there is a potential that such places might be found to be Aboriginal Sites in the future if further information becomes available, it is prudent to treat 'Lodged' places as if they are Aboriginal Sites until a determination has been made by the ACMC and the legal status of the place has been established.

Another category of listing covered by the term 'Other Heritage Places' and which frequently is the source of confusion is that relating to places and objects archived in 'Stored Data' (also referred to as 'Archived Data'). Typically, these are places and objects for which a determination has been made by the ACMC and it has been concluded that they do not satisfy the criteria set out in Section 5 of the AHA and are therefore not 'Aboriginal Sites' for the purposes of the Act. Such places are therefore not subject to the Act's provisions. However, these places and objects are not deleted from the system (AHIS), but rather are maintained as 'Stored' or 'Archived' data in order to account for the possibility that new

³ According to the Macquarie Dictionary, a 'place' can be defined as "a particular portion of space, of definite or indefinite extent"; "the portion of space occupied by anything"; "a space or spot set apart or used for a particular purpose" (Macquarie Dictionary 1998).

⁴ Decisions by the ACMC and the DAA, of course, may be overturned by the courts and indeed may be revisited by the ACMC itself.

⁵ 'Other Heritage Places' were previously listed either on the 'Interim Register' or in 'Stored Data'.

information may be presented in the future that might warrant a reassessment by the ACMC, and so that the DAA is aware if the same place is reported again.

It is also important to be cognisant of the possibility that places that do not have the legal protection of State or Commonwealth heritage legislation may still have significance for Aboriginal people and could therefore have implications for the community, and indeed for proposed developments, should they potentially be impacted.

2. ETHNOGRAPHIC SURVEY METHODOLOGY

The ethnographic survey was carried out broadly in line with guidelines published by the Department of Aboriginal Affairs (formerly the Department of Indigenous Affairs) (DIA 2002; 2013) and involved the following components:

- Desktop research;
- Selection of survey participants and preliminary consultations;
- Ethnographic field survey with the selected Aboriginal consultants; and
- Report preparation.

2.1 Desktop Research

The desktop research involved in the first instance an examination of the Register of Aboriginal Sites using the **DAA's** online Aboriginal Heritage Inquiry System (AHIS) and downloaded spatial data. The AHIS searches for the PDNH were originally carried out during the desktop assessment (see Coldrick, Hovingh & McDonald 2014) and were updated at the time of writing this report.

Relevant site files and a selection of available heritage survey reports were also reviewed **at the DAA's head offices in East Perth** or were provided to Amergin electronically by the Department. Additional background reports provided by Coffey and MRWA, and those held in the archives of Amergin and Ethnoscience, were also reviewed along with other pertinent background material.

2.2 Participant Selection and Preliminary Consultations

The NorthLink WA Aboriginal heritage surveys were conducted under the Whadjuk Aboriginal Cultural Heritage Protocol. The 'Whadjuk Protocol' is an agreement between MRWA and the DAA (as the representatives of the State of Western Australia) and the South West Aboriginal Land and Sea Council (SWALSC) on behalf of the Whadjuk community. The Protocol outlines how the parties intend to cooperate within the limits of the AHA and the ***Native Title Act 1993*** (Cth). The protocol requires that SWALSC, acting on behalf of the Whadjuk community, be consulted about Aboriginal heritage in the first instance and outlines a mechanism for assessing the impact of proposed activities on Aboriginal heritage. This includes the DAA and SWALSC agreeing on whether heritage surveys are required, who should be consulted and on what terms. In the case of NorthLink, it was determined that archaeological and ethnographic surveys were required.

Prior to fieldwork, MRWA presented Amergin with a list of Aboriginal people nominated by SWALSC under the Whadjuk Protocol to participate in the heritage

surveys (Table 1). Amergin was directed by MRWA to use this list as the primary basis for selecting participants and remunerating people for their involvement, although other family members were welcome to attend the surveys. The original SWALSC list was moderately expanded, however, with the approval of MRWA following completion of the desktop assessment in order to better address the requirements of DAA/ACMC with respect to consultation, as outlined in the *Aboriginal Heritage Due Diligence Guidelines*.⁶ The rationale for these additions is outlined below.

The Due Diligence Guidelines **identify four categories of 'relevant Aboriginal people' who "at least"** should be consulted where there is a possibility that an Aboriginal Site will be affected (DIA 2013: 9). They are:

1. Determined Native Title Holders;
2. Registered Native Title Claimants;
3. Persons named as informants on Aboriginal site recording forms held in the Register at DIA [DAA]; and
4. Any other Aboriginal people who can demonstrate relevant cultural knowledge in a particular area (DIA 2013: 9–10).

There are currently no determined Native Title Holders over the Study Area. However, the Study Area is encompassed by one registered Native Title Claim, **namely the 'Whadjuk People' Native Title Claim (WC2011/009) which is** represented by SWALSC. The Project is also encompassed by an unregistered and self-represented **claim, 'Swan River People 2' (WAD24/2011)**, which comprises members of the Wilkes, Corunna, Bropho, Warrell and Garlett families whose members formerly comprised the Combined Metropolitan Native Title Working Group (CMWG). Senior members of these families were involved in surveys undertaken for previous phases of planning for the PDNH and other projects in its vicinity (see, for example, **O'Connor** 2001, 2005, 2012; Hart 2000; De Gand & Morse 2000; Mattner, Chown & Bergin 2008).

The third category of **'relevant Aboriginal people' relates to listed site informants** for previously reported heritage places. The desktop research found that a number of listed informants for registered Aboriginal Sites and 'Other Heritage Places' within the NorthLink Project were not included on the original list supplied to MRWA, and several informants were subsequently approved by MRWA for inclusion at our request (Table 2). They included, for example, Cedric Jacobs, who

⁶ It should also be noted that some people on the original list were unsuitable for the archaeological survey given the physically demanding nature of this work which raised concerns in relation to Occupational Health and Safety. MRWA therefore directed that, where necessary, the nominated people should be asked to nominate more suitable members of their families to participate in the archaeological fieldwork on their behalf.

is the sole listed informant for DAA Place ID 20058 '**Temporary Camp**', a registered Aboriginal Site inside the proposed Reid/Tonkin/PDNL interchange, the construction of which will involve clearance of this area. Mr Jacobs reported this site following previous disturbance by MRWA in the 1990s (DAA Site File 20058; Coldrick, Hovingh & McDonald 2014: 21–23).

The final category specified under the DAA's Due Diligence Guidelines ("any other Aboriginal people who can demonstrate relevant cultural knowledge in a particular area") is more problematic to quantify. However, **it is our view that the DAA's** guidelines have been adequately addressed through those who were consulted and that maximum feasible participation was achieved with a broad cross-section of interests within the constraints of the available budget and other practical limitations.

The selected Aboriginal consultants (listed below in Table 1 & Table 2) were contacted where possible by telephone, letter and/or email and provided with background information including maps of the Survey Area. Some of those nominated could not be contacted for a range of reasons (e.g., incorrect contact details). The Aboriginal consultants who did participate in the ethnographic survey/consultations are listed below in Table 3 and Table 4.

Name	Families Connected To (Source: SWALSC)
Bella Bropho	Nettle
Joe Mourish	Bennell
Corrie Bodney	Bodney
Greg Garlett	Bennell
Albert Corunna	Wilkes
Theo Michael	Mead
Billy Narrier	Warrell
Kathy Penny	Ryder
Edith Warrell	Nettle
Greg Ugle	Jackamarra
Ron Gidgup Snr	Gidgup
Gloria Egan	Egan
Guy Ryder	Ryder

Table 1: Aboriginal consultants nominated for NorthLink under the Whadjuk Protocol (Source: SWALSC via MRWA)

Name	DAA-listed informant/next-of-kin for
Esandra Colbung	<ul style="list-style-type: none"> DAA Place ID 3692 Bennett Brook in toto (listed informant = Ken Colbung) which overlaps much of the PDNH on the public AHIS
Richard Wilkes	<ul style="list-style-type: none"> DAA Place ID 20008 Gingin Brook Waggyt Site DAA Place ID NOR/03 – Creek DAA Place ID 21393 NOR/02 Lightning Swamp DAA Place ID 21620 Chandala Brook (CMWG) <p>All of the above places overlap the NorthLink Project survey area as shown on the public AHIS</p>
Cedric Jacobs	<ul style="list-style-type: none"> DAA Place ID 20058 Temporary Camp, registered site (sole listed informant)
Patrick (Sullivan) Hume	<ul style="list-style-type: none"> DAA Place ID NOR/03 – Creek DAA Place ID 21393 NOR/02 Lightning Swamp DAA Place ID 21620 Chandala Brook (IAEG) <p>All of the above places overlap the NorthLink Project survey area as shown on the public AHIS</p>

Table 2: Additional Aboriginal consultants approved by MRWA

2.3 Ethnographic Field Survey/Consultations

Bryn Coldrick conducted the ethnographic field survey of the PDNH over two rounds of fieldwork: the first from 12–15th January 2015 and the second from 24–26th February 2015. The surveys were conducted in two phases due to bushfire activity north of Gnangara Road during the January fieldwork.

The surveys were conducted with the assistance of anthropologist Edward McDonald (Ethnoscience) and archaeologists Ryan Hovingh and Kellie Cue (SGH). SGH had recently completed the archaeological survey of the NorthLink project with the participation of Nyungar field assistants. Several of the Aboriginal consultants involved in the ethnographic survey had also been involved in the archaeological survey and were therefore familiar with the project and the archaeological sites in the vicinity of the survey corridor.

The ethnographic field survey was conducted over a number of separate sessions. Each session followed the same basic format, commencing with pre-start safety briefings and preliminary discussions at Altone Park Recreation Centre in Beechboro (January; Plate 1) and at the United service station on Gnangara Road (February). During these discussions, the ethnographer (Bryn Coldrick) orientated the teams and presented an overview of the project with the aid of maps provided by the NorthLink Project team that showed currently listed Aboriginal Sites and Other Heritage Places in relation to the survey area. The archaeologists also reported the findings of the recent archaeological survey and outlined management strategies being considered to ensure that no inadvertent impacts to known sites occur and to assist with the identification of archaeological material in areas of higher potential (Plate 2).

Following these preliminary discussions, the survey teams toured the Survey Area using four-wheel-drive vehicles and inspected a number of places on foot. Throughout the survey, the Aboriginal consultants were interviewed about the heritage values of the survey area and asked to report any places of importance and significance that they would want MRWA to avoid. It was pointed out that the key focus of ethnographic surveys are places of sacred, ritual or ceremonial significance (that is, places that could reasonably be expected to satisfy Section 5(b) of the AHA), though other places/values such as historical camps and burials should also be reported if known. The findings of the archaeological survey were also discussed with the Aboriginal consultants throughout the fieldwork in order to seek their comments in relation to previously reported archaeological sites that may require Section 18 approval.

Two of the selected Aboriginal consultants (Corrie Bodney and Patrick Hume) declined the invitation to participate in the fieldwork because of their age and frailty. They were therefore consulted at a separate meeting on 30th January 2015 where detailed maps were used to examine and discuss the survey area. At the conclusion of this meeting, the elders stated that they had been adequately briefed on the project.

Albert Corunna of the SRP, who took part in the first phase of the survey in January 2015 but was unable to participate in the second phase due to illness, nominated his daughter, Vanessa (who had assisted with the archaeological survey), to represent him during the second phase. Mr Corunna, via his daughter, provided a list of places/features he was concerned about and requested that the ethnographer contact him by telephone at each place during the fieldwork (see Table 8).

2.4 Report Preparation

This report was prepared by Bryn Coldrick with the assistance of Dr Edward McDonald.

Name	Family/Group Represented (cf. Table 1)	Date(s) Consulted
Albert Corunna	Swan River People	13/01/15 & 24/02/15 (the latter by telephone)
Bella Bropho	Nettle/Swan River People	13/01/15 & 24/02/15
Cedric Jacobs	Jacobs	15/01/15 & 24/02/15
Corrie Bodney*	Bodney/Ballaruk	30/01/15
Edith Warrell	Nettle	12/01/15 & 25/02/15
Esandra Colbung	Bibbulmun Tribal Group	26/02/15
Gloria Egan	Egan	12/01/15 & 25/02/15
Greg Garlett	Bennell/Swan River People	13/01/15 & 24/02/15
Greg Ugle	Jackamarra	12/01/15
Kathy Penny	Ryder	13/01/15 & 24/02/15
Patrick Hume*	Hume	30/01/15
Richard Wilkes	Wilkes/Swan River People	13/01/15 & 24/02/15
Ron Gidgup	Gidgup	12/01/15 & 25/02/15
Theo Michael	Mead	12/01/15 & 25/02/15
Vanessa Corunna	Swan River People	24/02/15
Vita Warrell	Swan River People	24/02/15

Table 3: List of Aboriginal consultants who participated in the PDNH ethnographic survey and consultations (*desktop consultation)

Name	Family Represented (cf. Table 1)	Date(s)
Ben Ugle	Jackamarra (assisting his father, Greg Ugle)	12/01/15 & 25/02/15
Chris Michael	Mead (assisting his father, Theo Michael)	12/01/15 & 25/02/15
Crispian Warrell	Swan River People	13/01/15
Stephen Anderson*	Bodney (assisting his father-in-law, Corrie Bodney)	30/01/15

Table 4: List of additional Aboriginal people who attended in a supporting role to the nominated consultants (*desktop consultation)

3. MODES OF REPORTING

Two principal kinds of connections between contemporary Aboriginal people and the land (or 'country') are generally recognised by anthropologists (Trigger 1983).⁷ These are:

- Religious/spiritual associations; and
- Historical associations.

The former category includes mythological, ceremonial and ritual associations, some of which have survived from pre-colonial times. In some instances, the locations of such sites are known but the details of the associated mythology and ritual have been lost. In others, aspects of the mythology and so on may be known but the precise locations of the sites are not. Also contained in this category are more recent spiritual associations which may have developed with a particular site or area.

Historical associations include a number of categories of connections to country including:

- Places where Aboriginal people have habitual associations;
- Places with specific event associations; and
- Places with biographical associations.

The historical associations with land are those which have essentially developed since colonisation and the displacement of Aboriginal people from their traditional lands. Habitual associations relate to places where Nyungars have worked, camped and used bush resources on a regular basis. Specific event associations are places where events of importance to an individual/family/group occurred (for example, a massacre site). Biographical associations refer to places where **aspects of an individual's life experience were located (place of birth, for example; for further discussion, see Trigger 1983).** As Baines (1988) and others have noted, historical associations are not based on mere sentiment but may also have spiritual implications, such as those places which are associated with birth and death. Many Nyungars believe, for example, that the spirits of the dead inhabit trees surrounding the camp where they died (McDonald, Hales and Associates 1995: 78-79; see also Coldrick et al 2012).

As mentioned above, the ethnographer emphasised the identification of sacred, ritual and ceremonial places as a key objective of the current survey as it is such

⁷ This section is based on Edwards & McDonald's (1999) overview of Nyungar associations with country and accounts given by Nyungars in the context of heritage surveys, and McDonald & Locke (2002).

places that have the potential to be considered Aboriginal Sites under Section 5(b) of the AHA. Under Section 39(3), the *Aboriginal Heritage Act (1972)* gives primacy to “associated sacred beliefs, and ritual or ceremonial usage, in so far as such matters can be ascertained” in the ACMC’s evaluation of the importance of places and objects. However, as we’ve discussed above, it would appear to be the case that the DAA/ACMC are increasingly restricting the application of Section 5, including for sacred sites (Section 5(b)), as reflected in the new Section 5 ‘threshold criteria’. Places of historical association are also difficult to successfully meet the requirements of the DAA/ACMC with respect to Section 5 (see, for example, Coldrick & McDonald’s (2012) report on Brookton Reserve for a recent case study).

McDonald and Locke (2002) observe that three broad genres are used by Nyungars in talking about country in the course of heritage surveys:

- Knowing the country;
- Reading the country; and
- Feeling the country.

Nyungar discourse in the context of ‘knowing the country’ is at one level relatively straightforward. A report such as “My father camped here. This is the remains of his camp and that plate nailed to the tree there is what he used to use for target practice” is typical of such accounts. Knowledge of particular mythological, ritual or ceremonial sites is also included in this genre.

Knowing the country could historically be understood in the context of ‘runs’. With reference to Nyungars, Baines (1988) allocates primary significance to knowing land through specifically ‘highlighted places’ (i.e., sites) within ‘runs’. Movement follows a set pattern within a designated tract of territory, referred to as a ‘run’, which in contemporary terms is a rough circle of towns, farms, camps, etc., associated with a particular family community. Family members typically move around their run while engaged in seasonal employment, visiting relatives and so on (Baines 1988; Birdsall 1988). An individual’s birthplace is generally central to one’s run. Baines also suggests that runs and associated sites are displayed in the telling of genealogically-framed stories; i.e., stories told between close kin. Therefore, a run commonly encompasses land referred to through the “intimacy of stories” which includes those stretches through which family members physically move(d).

Tonkin (1995:2) notes that genres signal the kinds of interpretations that are called for and provide a ‘horizon of expectation’ to a knowledgeable audience.

They also involve, she (1995:39) suggests, “a claim that one should be listened to”. Accounts involve expressions of social and linguistic competence, have pragmatic implications (e.g., Nyungar political claims, heritage assessment and cultural reproduction/revitalisation) and are contexted within a rhetorical framework which addresses and represents some demonstrated or assumed audience(s) (other survey participants, members of other Nyungar groups, the heritage consultant, the APMC, for example). Hence, the “intimacy of stories” referred to by Baines (1988) can be as methodologically problematic as the two other modes of reporting described below. Additionally, what an Aboriginal consultant ‘knows’ today may have been ‘read’ (both in terms of literature and ‘reading’ the country) or ‘felt’ yesterday. Conversely, what is ‘known’ may later be ‘read’ or ‘felt.’ For example, as Creamer (1988) reports, Aboriginal people have reported particular feelings and experiences following the discovery of new archaeological sites.

When ‘reading the country’, Nyungars may report the presence of sites or explain the cultural landscape on the basis of their understanding of how Nyungars, including people known to them, used the country in the past and in their own lifetime. Habitation sites are generally reported through the reading of country, and such reports may be supported by the existence of archaeological or other evidence. If reading the country is the basis for site identification, people may report “Nyungars *would* have camped here” or “this *would* have been an important camping site”. This is clearly not the same as an account involving a statement such as “My mother camped here and planted this tree”.

Mythological and ritual sites may also be reported on the basis of reading the country. While this is similar to the process described by Morphy (1995), Trigger and Robinson (2001) and others, what is generally absent is the detailed ‘code’ (Myers 1986) or “set of rules” (Trigger & Robinson 2001:113) relating to the Dreaming found in more traditional cultural settings. Fragments of such a code exist and are invoked and re-invented. In other words, people are frequently working in an agnostic state, particularly in respect of the Dreaming, about the cultural landscape they are commenting upon. To paraphrase Merlan (1998:222), there is “no elaborate Dreaming story” as there is often an attenuation of knowledge about specific mythological details.

Nyungars also sometimes report that they are able to “feel” the presence of spiritual elements in the land. Frequently, a report of a spiritual feeling about a place is also accompanied by other supporting evidence such as stories or biographical details of the person’s own or another’s associations with the place.

It is not uncommon, however, for individual Nyungars to report the presence of sites on the basis of feelings or other types of apparent transpersonal or extrasensory perceptions (i.e., hearing voices, feeling an unusual wind, experiencing body tremors and so on). The ability to feel or perceive the presence of spiritual matters is often (erroneously?) stated by Nyungars to be an important difference between themselves and non-Aborigines.

In many situations there is interplay between the various genres used by Nyungars to talk about the cultural landscape. For example, different Aboriginal consultants may use different genres in accounts about a place or a range of genres may be used in the same account.

4. ETHNOGRAPHIC SURVEY RESULTS

4.1 Desktop Assessment Findings

4.1.1 Registered Aboriginal Sites

The search of the Register of Aboriginal Sites using the online AHIS and downloaded spatial data revealed that the PDNH Study Area overlaps or partially overlaps eight (8) registered ethnographic Aboriginal sites as depicted on the **public** AHIS (Table 5; see also Appendix 1). These are discussed briefly below and in more detail in the desktop report (Coldrick, Hovingh & McDonald 2014).

- 1. DAA Place ID 3426 'South Ballajura Camp'** — a registered camping area depicted on the AHIS as a large 2x2km box to the west of Hepburn Avenue. However, a search of the internal AHIS undertaken by DAA for the NorthLink project did not reveal this site (which is restricted) as being inside the NorthLink Study Area. **According to O'Connor (2012), this site lay outside and to the west of his study area for the PDNH–Tonkin Link (O'Connor 2012:14).** It is therefore not believed to be a constraint for the current project (Coldrick, Hovingh & McDonald 2014: 47, 78, Appendix 2).
- 2. DAA Place ID 3692 'Bennett Brook In Toto' (Mythological)** — The "Bennett Brook area" was one of three areas of significance reported by Baines during her ethnographic research in relation to the Natural Gas Laterals project in the Perth metropolitan area (Baines 1984:1). O'Connor et al (1985) subsequently described the extent of the "Bennett Brook" site as *"extend[ing] approximately seven kilometres from the Bennett Brook/Swan River confluence to Mussel Pool in Whiteman Park, Whiteman. It comprises the brook and also its bank on either side.... Bennett Brook was formed by the creative actions of the Waugal, whose spiritual essence still exists there. For this reason the entire brook is an area of significance to Aborigines..."* (O'Connor 2012:16). In his assessment of the PDNH–Tonkin Link, O'Connor (2012) reports that *"The tributary of Bennett Brook which, during heavy rains, drains under Beechboro Road in the brook's better defined headwaters in Whitemans [sic] Park, is part of the registered site and is within the survey area"* (O'Connor 2012:14; see also O'Connor 2012:16–17). Permission to access the site file for this restricted site was granted to Amergin by the listed site informants, which confirmed that two tributaries of Bennett Brook are mapped as part of the registered site and are intersected by the Study Area to the west of Beechboro Road, north of Hepburn Avenue.
- 3. DAA Place ID 3840 'Bennett Brook: Camp Area' (Artefacts/Scatter, Ceremonial, Fish Trap, Historical, Man-Made Structure, Mythological, Skeletal Material/Burial)** — this multicomponent site is depicted on the AHIS as a large box measuring 6km north–south by 4km east–west overlapping the Study Area along Reid Highway. However, a search of the internal AHIS undertaken by DAA for the NorthLink project did not reveal this site (which is restricted) as being inside the NorthLink Study Area. It is therefore not believed to be a constraint for the current project (Coldrick, Hovingh & McDonald 2014: Appendix 2).
- 4. DAA Place ID 20008 'Gingin Brook Waggyt Site' (Mythological, Historical)** — Gingin Brook is associated with Waugal mythology and has been reported as a source of food and plant resources. People also used to

camp along the brook. Gingin Brook itself is located to the north of the Study Area but it forms part of a site complex created by the DAA (Complex 42) that comprises all the wetlands and interconnected watercourses between Bullsbrook and Moore River including DAA Site IDs 19183, 20749 and 21614–21620 (Coldrick, Hovingh & McDonald 2014:20–21).

5. **DAA Place ID 20058 'Temporary Camp' [Camp]** — a former camping area inside the proposed PDNH/Tonkin Highway/Reid Highway Interchange, recorded by Robert Reynolds (an officer of the Department of Indigenous Affairs) with Cedric Jacobs in 1994 following reports of disturbance by MRWA. According to Rev. Jacobs, this was an important camping site that had been used by his family and other Aboriginal people for generations (Coldrick, Hovingh & McDonald 2014:21–22).
6. **DAA Place ID 20749 'Moore River Waugal' (Mythological)** — Moore River is located to the north of the Study Area and is listed as a result of its association with DAA's Complex 42 (Coldrick, Hovingh & McDonald 2014:23).
7. **DAA Place ID 21393 'NOR/02 – Lightning Swamp' (Ceremonial, Mythological)** — reported as "a place of high cultural significance" following a survey for the Noranda Regional Park complex by Australian Interaction Consultants (AIC) in 2009. The wetland was reported to be part of an underground stream to Bennett Brook, and the bushland surrounding it a place of camping and hunting and part of a movement run. AIC reported that Corrie Bodney's mother used to camp, hunt and gather here when it was 'natural' and Mr Bodney reportedly requested that visitors throw sand into the water here to avoid a "backlash from the Waugal". AIC further reported that, according to the McGuire family, Lightning Swamp "... was a big meeting place for cultural activities and for seasonal camping, hunting and gathering" and that native plants here are used in bush medicine (Coldrick, Hovingh & McDonald 2014:23–24). The Study Area marginally intersects the site's boundary.
8. **DAA Place ID 21620 'Chandala Brook' (Mythological)** — Chandala Brook, which connects with Ellen Brook at Muchea, also forms part of DAA's site Complex 42 (Coldrick, Hovingh & McDonald 2014:25–27).

Based on the above, the registered ethnographic sites that could potentially be impacted by the PDNH are concluded to be as follows:

1. DAA Place ID 3692 'Bennett Brook In Toto' (specifically tributaries of the Brook);
2. DAA Place ID 20058 'Temporary Camp' [Camp];
3. DAA Place ID 21393 'NOR/02 – Lightning Swamp'; and
4. DAA Place ID 21620 'Chandala Brook' (and, through association with DAA's Complex 42, DAA Place ID 20008 'Gingin Brook Waggy Site' and DAA Place ID 20749 'Moore River Waugal').

The search of the AHIS also revealed one registered archaeological site overlapped by the study area (DAA Place ID 3180 'Marshall, Beechboro'). This site was recorded in 1973 as part of the SAAS (Hallam 1972; Hallam 1977; Hallam 1987) and was found to have been disturbed by the construction of Marshall Road (see also O'Connor & Quartermaine 1987). Later investigations by Harris (1994),

Macintyre Dobson & Associates (1998) and more recently by SGH for NorthLink (2014) found no artefacts within the area. However, as a registered site, DAA Place ID 3180 may still be considered a *place* to which the AHA applies unless determined not to be an Aboriginal Site by the ACMC.

Table 5: Registered Aboriginal Sites overlapped by the PDNH as shown on public AHIS

Place ID	Site Name	Site Type	Comments
3180	Marshall, Beechboro	Artefacts/Scatter	Archaeological Site (refer to Hovingh & Ogilvie 2015)
3426	South Ballajura Camp	[Camp]	Outside Study Area
3692	Bennett Brook: In Toto	Mythological	Tributaries intersect Study Area
3840	Bennett Brook: Camp Area	Artefacts/Scatter, Ceremonial, Fish Trap, Historical, Man-Made Structure, Mythological, Skeletal Material/Burial	Outside Study Area
20008	Gingin Brook Waggy Site	Historical, Mythological	Part of DAA Complex 42
20058	Temporary Camp	[Camp]	Destroyed in 1990s
20749	Moore River Waugal	Mythological	Part of DAA Complex 42
21393	NOR/02 - Lightning Swamp	Ceremonial, Mythological	Study Area marginally intersects the site boundary.
21620	Chandala Brook	Mythological	Watercourse near Muchea. Part of DAA Complex 42

4.1.2 Lodged Heritage Places

The PDNH Study Area overlaps or partially overlaps the following Lodged ethnographic heritage places (Table 7).

- 1. DAA Place ID 3525 'Ellen Brook: Upper Swan' (Mythological)** – Ellen Brook (*Gynning*) was reported by MHA in 1989 as a mythological site associated with the spiritual 'turtle' and plays a mythological role as their Dreaming Track. In addition to their mythological associations, the turtles were also described in a secular manner as living creatures that use Ellen Brook to swim down to the Swan River. The ecological importance of the turtles was therefore also noted (MHA 1989:3). MHA also reported that Ellen Brook is part of the greater system of waterways associated with the Rainbow Serpent or *Waugal* (see also O'Connor & Quartermaine 1987:2). The tributaries of Ellen Brook are also considered to be of mythological significance (McDonald & Murphy 1991:21; Lantzke & Hammond 1993:14; O'Connor 2005a:8). In 2004, the Ellen Brook "system" was remapped by the DIA [now DAA] to include all tributaries and was included in DAA's Complex 42 (Coldrick, Hovingh & McDonald 2014:29–31). A number of

tributaries mapped as part of DAA Place ID 3525 are intersected by the Study Area at various locations including to the north of Neaves Road, north of Gaston Road, along Muchea Road South and Great Northern Highway. The main watercourse is also intersected and will require a bridge crossing. There have been multiple ACMC resolutions concerning the status of DAA Place ID 3525 with respect to Section 5, and resolutions from 1993–2003 indicate that it was formerly a registered site. In 2009, however, the ACMC determined there was insufficient information to determine its status under Section 5 and it is now classified as a Lodged place.

- 2. DAA Place ID 20650 'Lennard Brook' (Mythological)** — Lennard Brook is located outside the Study Area to the north of Muchea. It forms part of DAA site Complex 42.
- 3. DAA Place ID 21616 'Boonanarring Brook' (Mythological)** — Boonanarring Brook is located outside the Study Area to the north of Gingin and also forms part of DAA's site Complex 42.
- 4. DAA Place ID 21617 'Wallering Brook' (Mythological)** — Wallering Brook is located outside the Study Area to the north of Gingin and also forms part of DAA's site Complex 42.
- 5. DAA Place ID 21618 'Nullilla Brook' (Mythological)** — Nullilla Brook is located outside the Study Area to the north of Muchea and also forms part of DAA's site Complex 42.
- 6. DAA Place ID 21619 'Breera Brook' (Mythological)** — Breera Brook is located outside the Study Area to the north of Muchea and also forms part of DAA's site Complex 42.

Based on the above, it would appear that DAA Place ID 3525 'Ellen Brook: Upper Swan' and other watercourses associated with DAA's Complex 42 (DAA Place IDs 20650, 21616, 21617, 21618 and 21619) are the Lodged ethnographic sites that could potentially be impacted by the PDNH.

There are three (3) Lodged archaeological sites (all artefacts/scatters) shown on the AHIS as being overlapped by the Study Area:

- DAA Place ID 3618 'Whitemans Cutting';
- DAA Place ID 3619 'Whitemans Quarry'; and
- DAA Place ID 21994 'Neaves Road Creek Field Site 01'.

During the archaeological survey, only DAA Place ID 21994 was found to be extant. However, the site was verified on the ground to be located outside the location shown on the AHIS and outside the Study Area (Hovingh & Ogilvie 2015).

Table 6: Lodged Heritage Places overlapped by the PDNH as shown on public AHIS

Place ID	Site Name	Site Type	Comments
3525	Ellen Brook: Upper Swan	Mythological	Tributaries intersect Study Area
3618	Whitemans Cutting	Artefacts/Scatter	Archaeological Site (refer to Hovingh & Ogilvie 2015)
3619	Whitemans Quarry	Artefacts/Scatter	Archaeological Site (refer to Hovingh & Ogilvie 2015)
20650	Lennard Brook	Mythological	DAA Complex 42
21616	Boonanarring Brook	Mythological	DAA Complex 42
21617	Wallering Brook	Mythological	DAA Complex 42
21618	Nullilla Brook	Mythological	DAA Complex 42
21619	Breera Brook	Mythological	DAA Complex 42
21994	Neaves Road Creek Field Site 01	Artefacts/Scatter	Archaeological site verified to lie outside Study Area (refer to Hovingh & Ogilvie 2015)

4.1.3 Heritage Places in Stored Data

The following ethnographic listings in Stored Data are also shown on the AHIS as overlapping or partially overlapping the Study Area (Table 7). Although they are not Aboriginal Sites for the purposes of the AHA, these are summarised briefly below:

- **DAA Site ID 18735 'Beechboro Camping Area' [Plant Resource, Camp]** – Camping area reported by O'Connor following consultations with members of the Bodney family in relation to proposed roadworks between Marshall Road and the Reid Highway/Tonkin Highway intersection in 2001. According to O'Connor, *"No trace of this camp remains today. The Aboriginal people consulted in the course of this survey, including the last surviving members of the family which actually camped there, were satisfied that it was merely an occasional camp and could not be seen as an area of significance on the grounds of sentimental or other associates [sic]"* (O'Connor & Quartermaine 1987:3). In our desktop report, we suggest that DAA Site ID 18735 'Beechboro Camping Area' and DAA Site ID 20058 'Temporary Camp' (registered site) are one and the same place (Coldrick, Hovingh & McDonald 2014: 42–43).
- **DAA Site ID 19138 'Wetlands & Watercourses Moore River To Bullsbrook' (Mythological)** – DAA Site ID 19138 comprises DAA Site IDs 3525, 19183, 20008, 20749 and 21614–21620 and would appear to correspond to DAA's Complex 42. Collectively, the wetlands and watercourses have been found not to constitute an Aboriginal site, though some of the individual watercourses are considered sites under the Act (i.e., DAA Place ID 21620 'Chandala Brook', DAA Place ID 20008 'Gingin Brook Waggy Site' and DAA Place ID 20749 'Moore River Waugal').
- **DAA Site ID 19183 'Red Gully Creek' (Mythological)** – Red Gully Creek is located outside the Study Area to the north of Gingin and forms part of DAA's Complex 42.

- **DAA Place ID 21392 'NOR/03 - Creek' (Mythological)** — Water Corporation drain, reported by AIC during the Noranda Regional Park heritage survey. AIC report that *"At the time, the creek was a drain which the Elders indicated was originally a creek and did not object to it being converted into a living stream. The creek was identified by the Elders as being a site of significance but no further information was noted"* (AIC 2009: 23). No further details are given in the site file.

Finally, there are two (2) 'Stored Data' archaeological places (both artefacts/scatters) shown on the AHIS as being overlapped by the Study Area:

- DAA Place ID 3552 'Marshall/Della Roads' ; and
- DAA Place ID 4099 'Beechboro Road' (artefacts/scatter).

During the recent archaeological survey, neither was found to be extant (Hovingh & Ogilvie 2015).

Table 7: Stored Data Places overlapped by the PDNH as shown on public AHIS

Place ID	Site Name	Site Type	Comments
3552	Marshall/Della Roads	Artefacts/Scatter	Archaeological Site (refer to Hovingh & Ogilvie 2015)
4099	Beechboro Road	Artefacts/Scatter	Archaeological Site (refer to Hovingh & Ogilvie 2015)
18735	Beechboro Camping Area	[Camp]	Possible duplicate of DAA Place ID 20058
19138	Wetlands & Watercourses Moore River to Bullsbrook	Mythological	DAA Complex 42
19183	Red Gully Creek	Mythological	DAA Complex 42
21392	NOR/03 - Creek	Mythological	Water Corporation Drain

4.1.4 Previous Heritage Surveys ⁸

There have been numerous previous ethnographic surveys in the vicinity of the PDNH, including but not limited to:

- **Brown's ethnographic investigations relating to proposed highway and road developments** in the Perth metropolitan area, including what is now Tonkin Highway (Brown 1983);
- **Baines' (1984) survey of the Natural Gas Laterals;**
- **Survey for Aboriginal sites in the vicinity of the proposed Northern Perimeter Highway Road (O'Connor & Quartermaine 1987);**
- **Survey of the Pinjar Gas Turbine and Services Project (O'Connor & Quartermaine 1988; Quartermaine 1990);**
- **Ethnographic research at Ellenbrook and the Vines (McDonald 1989; MHA 1989; McDonald, Smith & Murphy 1991; O'Connor 1997; Macintyre Dobson & Associates 1998);**
- **MHA's survey of the proposed Perth–Darwin Highway/Lord Street extensions (Blockley & Lantzke 1995);**
- **Ethnographic survey of the Beechboro Land Scheme (O'Connor 1998);**
- **Ethnographic survey of the Hepburn Avenue extension (Hart 2000);**
- **Ethnographic survey of roadworks between Marshall Road and Reid Highway/Tonkin Highway Junction (O'Connor 2001, Hart 2001);**
- **Aboriginal heritage assessment of the Ellen Brook Constructed Wetland Project, Bullsbrook (De Gand & Morse 2000);**
- **Aboriginal heritage surveys and Section 18 consultations regarding road upgrades near Muchea (Mattner, Chown & Bergin 2008); and**
- **O'Connor's ethnographic surveys of the PDNH (O'Connor 2005b, 2012).**

The PDNH has also been covered by a number of regional-scale studies including **O'Connor, Bodney and Little's (1985) survey of Aboriginal areas of significance** in the Perth metropolitan region; the Ballaruk Aboriginal site recording project (Machin 1994/95); and the study of groundwater-related Aboriginal cultural values on the Gngangara Mound (McDonald, Coldrick & Villiers 2005).

As far as can be ascertained, no ethnographic sites apart from those referred to above have been identified inside the PDNH study area as a result of these surveys. Brown (1983:13), drawing on Robinson (1976), refers to graves in the vicinity of Widgee Road. However, these were never located (Coldrick, Hovingh & McDonald 2014: 46).

⁸ These surveys are summarised in detail in the desktop report (Coldrick, Hovingh & McDonald 2014).

4.2 Results of the Ethnographic Field Survey/Consultations

4.2.1 Previously Reported Ethnographic Places

The majority of the Aboriginal consultants had no objections to the proposed PDNH as a whole, and several of the elders acknowledged the benefits of the project generally for the wider community. However, representatives of the Whadjuk Native Title Claimants and Swan River People (SRP) stated that the proposed alignment should avoid registered Aboriginal sites wherever possible.

The protection of the waterways and wetlands was the primary concern of all the Aboriginal consultants. One of the Whadjuk representatives stated it is “**vital**” that the watercourses be protected as they all lead somewhere, while another consultant commented “**Water is the giver of all life**” and stated that if the PDNH affects the water, everything that relies on it (plants, animals, etc.) will also be affected.⁹

DAA Place ID 3692 ‘Bennett Brook In Toto’

None of the Aboriginal consultants specifically identified the tributaries that cross the Study Area west of Beechboro Road as being part of the Bennett Brook site (DAA Place ID 3692 ‘**Bennett Brook In Toto**’). However, other tributaries along Reid Highway that are not currently mapped as part of the site were reported to connect with the brook. Throughout the survey/consultations, the Aboriginal consultants requested that if waterways and wetlands cannot be avoided, MRWA should go over them (using bridges, culverts etc.) and that other measures such as pollutant traps should be used to avoid impacts on water quality.

DAA Place ID 20058 ‘Temporary Camp’

Inspections of the location of DAA Place ID 20058 ‘**Temporary Camp**’ revealed that this site is no longer extant (Plate 3 & Plate 5). Mr Jacobs, who reported the site following previous disturbance in the 1990s (though the camping area may have been reported previously and listed as DAA Site ID 18735 ‘**Beechboro Camping Area**’) reported that sand had been deposited on top of it at that time and that it was destroyed. Mr Jacobs said he remembered visiting the camp as a child in the 1950s, though could not recall when it ceased being used. However, he commented that the name ‘**Temporary Camp**’ was inappropriate as members of the Jacobs and Cooper families and others had camped here over a longer term.

⁹ McDonald, Coldrick & Villiers (2005) and McDonald, Coldrick & Christensen (2008) discuss Nyungar values associated with surface and groundwater including the use of metaphors of life, blood and so on in articulating such values.

Neither Mr Jacobs nor any of the other Aboriginal consultants raised any particular concerns about further impacts on the former camping area arising from the PDNH given that it is no longer extant, with the greater concern being the potential impact to the groundwater in this area. Mr Jacobs reported that those who camped here were able to obtain water by digging down as a result of the high water table, and the SRP consultants pointed out that the modified wetlands here had large quantities of water at the time of the survey despite the lack of rain, suggesting that they were being fed by groundwater. Mr Jacobs **stated that the presence of this groundwater made the whole area “sacred” as it forms part of the spirituality and theology of Aboriginal people, though he declined to provide specific details (e.g., cultural narratives).** He commented **elsewhere within the PDNH survey area that groundwater is “part of the [Waugal] mythology”.** However, no details of this mythology, as it might relate to this specific area, were provided.

Requests were made that the large trees in the area be avoided if possible and that monitors be present during earthworks. Despite the large amount of disturbance in the area, evidence that it remains a habitat for fauna such as birds, lizards and snakes was also pointed out and examples of bush tucker were identified (Plate 4). The Aboriginal consultants expressed the desire that the modified wetlands be retained for the reasons outlined above and that the former camp be acknowledged in the design of the PDNH through interpretive elements such as signage, murals, use of colours etc.

Lightning Swamp (DAA Place ID 21393)

Lightning Swamp was reported to have been part of a movement run between camps and a camping area in itself. The wetland and surrounding bushland were reported to have been used as hunting and gathering areas, and general mythological associations of water were reported as values here also. One of the **Aboriginal consultants described Lightning Swamp as being “part of a story”,** but **no detailed information about the area’s mythological** associations (e.g., specific cultural narratives) or ceremonial associations were provided. With respect to the importance and significance of former camps for Aboriginal people today, one of the male consultants from the SRP stated:

... our people lived around there [Lightning Swamp] and they camped there and all that and it’s a camping place for the people; people were born there and they probably died there too as well and [are] buried around in that area there. And that is why places like that are of importance to us...

At the time of the survey, the PDNH survey area overlapped a portion of the registered site east of Malaga Drive, and some of the Aboriginal consultants reported that they had been consulted recently **in relation to MRWA's proposals to upgrade this intersection and encroach on the site**. While the majority of the Aboriginal consultants acknowledged that the overlap with the registered site was minor and would not pose a major threat to the site, some requested that the integrity of the site boundary be respected to avoid cumulative impacts over time.

Since the survey of this portion of the PDNH was undertaken (January 2015), the Study Area boundary was revised and it now terminates approximately 700m east of the Malaga Drive intersection, removing the main area of overlap from the current assessment with only a negligible overlap now occurring between the PDNH Study Area and the registered site along Reid Highway. MRWA should ensure there are no impacts to the registered site that might breach Section 17 unless the site is included in Section 18 consent.

Chandala Brook (DAA Place ID 21620), Ellen Brook (DAA Place ID 3525) and Other Watercourses

No substantial 'new' information was reported about the mythological significance of registered site Chandala Brook (DAA Place ID 21620), Lodged place Ellen Brook/*Gynning* (DAA Place ID 3525) or the other watercourses that form part of **DAA's Complex 42** (DAA Place IDs 20650, 21616, 21617, 21618 and 21619).

However, Albert Corunna reported that **"The Waugal is powerful at Gynning because the water rises out of the sand at [*Bebingarup*] and never stops flowing which makes it highly significant and sacred"** (Table 8). He reported that the water comes down Lennard Brook and eventually runs into the Swan River and that the **"Waugal planned all this"**. As stated above, Mr Corunna also requested his daughter, Vanessa, throw sand into *Gynning* at Muchea to appease the Waugal. *Gynning* was also confirmed to be associated with the 'Turtle', with tributaries and wetlands connecting it reported to be important for sustaining these creatures (see below for further comment).

4.2.2 Newly Reported Ethnographic Places and Features

A number of places and features that the Aboriginal consultants would prefer are avoided, but do not currently appear on the AHIS, were reported within and in the vicinity of the PDNH, mainly by Mr Corunna of the SRP. These are outlined briefly below. The SRP consultants also raised concerns that vegetation clearance, which will inevitably be required for the PDNH, may further reduce habitats for

native animals such as marsupials and snakes, and requested to be given the results of the fauna surveys and to be kept informed about the potential environmental impacts of the proposed works. Richard Wilkes **stated that “Where there is any of them marsupials left, that should be fenced off and they should be protected”**. He also stated that the **“local bush should be kept”** as it is part of **“our heritage”**. Another consultant not affiliated with the SRP described trees that support animals such as possums as **“heritage trees”**.

Altone Road Wetland (400363mE, 6474401mN)

A wetland was inspected to the south of Reid Highway and east of Altone Road. An artefact scatter in this area (DAA Place ID 3639) is lodged with the DAA and there were reports that a spring may have been located to the north of the wetland. However, no spring was identified during the inspection and no specific ethnographic information that would support registration of the wetland under Section 5 was provided, though concerns were raised about pollution entering the wetland from the upgraded highway (Plate 6). Since the fieldwork (January 2015), the PDNH project area has been revised and this wetland now lies outside the Study Area.

Keith Maine Centre Burial (398429mE, 6477943mN)

Theo Michael reported that there is a traditional burial(s) located within the grounds of the Keith Maine Centre at Whiteman Park, to the east of Beechboro Road. The reported location is approximately 800m east of the PDNH Study Area and will not be impacted by the proposed development.

Baal Street “Sacred Area” (397435mE, 6478914mN)

Further north, the Swan River People declared the area surrounding Baal Street to be a **“sacred area”** due to the presence of **Morrison bushes** (which they reported to be prolific in this area) and native Christmas trees (*Moojarr*) (Plate 7).

Moojarr (*Nuytsia floribunda*) are known to be culturally associated with the spirits of the dead.¹⁰ No specific cultural associations were reported in relation to

¹⁰ Bates (1992) noted that Nyungars traditionally believed that the souls (*kaanya*) of the dead inhabited the *moojarr* or native ‘Christmas tree’ for some time after death and that Nyungars would not touch the tree or use it for artefacts or even firewood. Bates (1992:153) reported:

No living Bibbulmun ever sheltered or rested beneath the shade of the tree of souls; no flower or bud or leaf of the tree was ever touched by child or adult; no game that took shelter beneath it was ever disturbed. But the Bibbulmun did not fear the tree; they loved it, but held it sacred for its spiritual memories. The souls of all their forebears had rested on the spirit tree on the way to Kurannup [the land of the dead].

However, according to Wheeler (2007) and Daw, Walley & Keighery (1997), Aboriginal people used to dig up and eat the suckers of the Christmas tree which occurs through much of the South West forests, woodlands and adjacent coastal plain from Kalbarri to Israelite Bay and inland to near Kellerberrin (Wheeler 2007:10). During the current consultations, one of the Whadjuk representatives

Morrison bushes, though the plant is reported to flower at the same time of the year as the *Moojarr* and a consultant not affiliated with the SRP named some elders who used to collect the plant for sale from the opposite (eastern) side of Beechboro Road. Another Aboriginal consultant reported that the bush along Beechboro Road as far as Gngangara Road was a “food bowl” or “supermarket” and was used as hunting grounds.

However, the SRP’s primary objection to the PDNH in this area was their contention that “Aboriginal land” would be taken away from the Cullacabardee community, and they argued that the PDNH should travel closer to the existing Beechboro Road.

Maralla Road Hilltop (403545mE, 6487735mN)

As indicated above, Albert Corunna of the SRP provided a list of places/features he was concerned about in the vicinity of the PDNH north of Gngangara Road which he asked the survey team to visit in his absence (listed below in Table 8; see also Figure 2). They include another large *Moojarr* (which he requested either be avoided or be moved) and other plants on a hilltop along Maralla Road. He also reported that the nearby paperbark swamp drains into a turtle sanctuary known as Twin Swamps.

Twin Swamp Turtle Sanctuary (406225mE, 6489626mN)

Mr Corunna reports that Twin Swamps, which lies approximately 2.5km east of the PDNH Study Area on the corner of Warbook Road and Railway Parade, was “the main camp for the Bodyadorling area” and is concerned that pollution caused by the PDNH could find its way here. Twin Swamps was described as “sacred” as a home to the little turtle (*booyee*), an endangered species, and a food source containing zamia palms and other plants. The turtles and frogs were reported to follow the tributaries. Cedric Jacobs also described Twin Swamps as a sanctuary for short-necked tortoises.

Bodyadorling (403740mE, 6490203mN)

According to Mr Corunna, *Bodyadorling* is the name given to the small wetland near the corner of Warbrook Road and Raphael Road, approximately 120m east of the PDNH Study Area (Plate 8). A tributary of Ellen Brook (*Gynning*) to the north of and which may connect with *Bodyadorling*, is partially mapped by the DAA as part of DAA Place ID 3525 ‘Ellen Brook: Upper Swan’, though the wetland itself is not currently shown as part of this Lodged place.

reported that *Moojarr* are associated with women and that if these trees are to be relocated that women should be involved.

A number of the Aboriginal consultants expressed concerns about the proximity of the PDNH to this wetland, pointing out that it supports a variety of animal and bird life which includes, according to a local resident, long-necked turtles. As noted above, Mr Corunna is also concerned that pollution entering this wetland could find its way to Twin Swamps. He pointed out that the watercourses are interconnected, with water coming from Gingin Brook and Lennard Brook joining up with Ellen Brook and eventually the Swan River. Richard Wilkes added that all swamps and watercourses should either be avoided or crossed with a bridge. He stated that they are all considered 'sites' and MRWA should respect the waterways.

Meenolun (403642mE, 6497340mN)

The creek at the corner of Neaves Road and Davidson Street was reported by Mr Corunna to be called *Meenolun*. This creek is mapped by the DAA as part of DAA Place ID 3525 'Ellen Brook: Upper Swan'. Mr Corunna is concerned that if the highway crosses *Meenolun* it might impact the water quality of *Gynning* [Ellen Brook] and he requested that pollutant traps be installed to prevent this happening.

Garbora Garlowrang (406061mE, 6498126mN)

Garbora Garlowrang (Cobbler Pool), which lies upstream of the Rutland Road bridge approximately 3km east of the PDNH is, according to Mr Corunna, a location visited by George Fletcher Moore in 1835 under the guidance of Gear and Beguin. Again, Mr Corunna is concerned that the construction of a highway bridge upstream might impact on the water quality at *Garbora Garlowrang*. This location, which was not visited during the fieldwork, appears to be inside the boundary of DAA Place ID 3525 'Ellen Brook: Upper Swan'.

4.2.3 Consultation on the Archaeological Findings

The Aboriginal consultants were satisfied with the process and findings of the NorthLink archaeological survey (Plate 9). Two newly identified archaeological sites ('NorthLink 14-01' and 'NorthLink 14-02') were located along the edge of the Study Area, and one previously recorded place (DAA Place ID 21994 'Neaves Road Creek Field Site 01'), which appears to be incorrectly mapped on the AHIS, was also found to lie outside the survey area (Hovingh & Ogilvie 2015).

The Aboriginal consultants want steps taken to ensure that these sites are not impacted. They also requested that access to these sites is not cut off as a result of the highway. Recommendations for their management are outlined the

archaeological report (Hovingh & Ogilvie 2015) and further consultation should take place in the event that any of these sites needs to be impacted in the future. The comments above regarding Lightning Swamp demonstrate the cultural value of former camping areas as a result of their perceived association with the ancestors and past lifeways. One of those consulted commented in relation to the newly identified sites, **"It's good when you find these things. It proves we were here"**.

With respect to the registered archaeological site DAA Place ID 3180 ('Marshall, Beechboro') and the other Lodged artefact scatters (DAA Place ID 3618 'Whitemans Cutting' and DAA Place ID 3619 'Whitemans Quarry'), the Aboriginal consultants acknowledged that these sites had been developed/destroyed and raised no particular concerns about further impacts from the PDNH. However, several of the consultants expressed their disapproval of the past collection and removal of artefacts from archaeological sites in the 1970s/80s, describing it as **"wrong"**, and **supported the archaeologists' recommendations with respect to monitoring** (see Hovingh & Ogilvie 2015).

Name	Position (GDA94, MGA Zone 50)	Description (provided by Albert Corunna, Feb. 2015)
Hilltop on Maralla Road	403545mE, 6487735mN	"The highway would pass through this old Muja [<i>Moojarr</i>] (Christmas Tree) and through the Paperbark Swamp in the background. The Swampy area drains into the Turtle Sanctuary. Other plants to be impacted will be Djiriji (Palm Bush)"
Bodyadorling	403740mE, 6490203mN	"Soak near corner of Warbrook Road and Raphael Road.... The proposed highway would be only metres away from this soak. Plenty of frogs and birds here, water drains into Turtle Sanctuary".
Twin Swamp Turtle Sanctuary	406225mE, 6489626mN	"Twin Swamp Turtle Sanctuary near corner of Warbook Road and Railway Parade.... the water runs under the railway line into the Turtle Sanctuary. This was the main camp for the Bodyadorling area. High sandy ground next to fishing and hunting spots. There is also enough vegetable food (Zamia and Bulbs) to feed large groups of people. Polluted water from the highway might run into this Sanctuary".
Meenolun ¹¹	403642mE, 6497340mN	"Creek at the corner of Neaves Road and Davidson Street. The highway would pass through this point. The creek runs east into Ellen Brook. If the highway crosses Meenolun then it might impact the water quality of Gynning [Ellen Brook]".
Gynning [DAA Place ID 3525]	404012mE, 6505799mN	"Gynning at Brand Highway Bridge near Muchea.... The highway would cross Ellen Brook to the south and then cross the Brand highway [sic] a few hundred metres east of here. The Waugal is powerful at Gynning because the water rises out of the sand at [Bebingarup] and never stops flowing which makes it highly significant and sacred".
Garbora Garlowrang ¹²	406061mE, 6498126mN	"The Cobbler Pool is upstream of the Rutland Road bridge. In 1835 Gear and Beguin guided George Fletcher Moore here. The construction of a highway bridge upstream might impact on the water quality at Garbora Garlowrang".

Table 8: Places of cultural significance reported by the Swan River People, February 2015

¹¹ This is a tributary of Ellen Brook (*Gynning*) and is mapped as part of DAA Place ID 3525 Ellen Brook: Upper Swan.

¹² This place was not visited during fieldwork. However, the location provided lies within DAA Place ID 3525 Ellen Brook: Upper Swan.



Figure 2: Overview of the PDNH showing some of the places/features discussed



Plate 1: Bryn Coldrick (Amergin Consulting, left) outlining the NorthLink project to some of the Whadjuk representatives during the pre-start meeting at Altone Park (from left): Gloria Egan (obscured), Ben Ugle, Greg Ugle and Ron Gidgup (Photo: McDonald, January 2015)



Plate 2: Archaeologist Ryan Hovingh (SGH, centre left) reports the findings of the NorthLink archaeological survey to (from left) Ron Gidgup, Chris Michael, Theo Michael, Ben Ugle and Greg Ugle, as Bryn Coldrick takes notes (Photo: McDonald, January 2015)



Plate 3: Cedric Jacobs inspects the location of DAA Place ID 20058 'Temporary Camp'. Note the imported sand and disturbance (Photo: Coldrick, January 2015)



Plate 4: Cedric Jacobs locates a Quairading tuber near DAA Place ID 20058 'Temporary Camp' which he reports is used as bush tucker (Photo: Coldrick, January 2015)



Plate 5: SRP elders Albert Corunna (obscured), Richard Wilkes and Greg Garlett explain aspects of the area's heritage values to Bryn Coldrick during the inspection of DAA Place ID 20058 'Temporary Camp' (Photo: Hovingh, January 2015)



Plate 6: Whadjuk elder Ron Gidgup (right) discussing aspects of the NorthLink project with (from left) Eddie McDonald (Ethnoscience) and Ben Ugle, while archaeologist Ryan Hovingh (SGH) takes a GPS reading, north of the wetland near Altone Road (Photo: Coldrick, January 2015)



Plate 7: The crossing point of the PDNH on Baal Street, looking west towards Cullacabardee. The SRP consultants reported that the Morrison plants (seen here in bloom) and native Christmas trees (*Moojaar*) make this area sacred (Photo: Coldrick, January 2015)



Plate 8: The small wetland, which Albert Corunna reports as *Bodyadorling*, near the corner of Raphael Road (visible in background) and Warbrook Road (Photo: Coldrick, February 2015)



Plate 9: Ryan Hovingh (right) records the newly identified archaeological site NorthLink 14-01 on the edge of the PDNH survey area as one of the Nyungar survey participants continues inspecting the site (Photo: Coldrick, December 2014)

5. DISCUSSION OF FINDINGS

Notices to use land under Section 18 of the AHA require applicants to list registered Aboriginal Sites and places that could reasonably be considered Aboriginal Sites that may be impacted by a proposed land use. As stated above in the discussion of the desktop findings, the registered ethnographic sites that could potentially be impacted by the PDNH are:

1. **DAA Place ID 3692 'Bennett Brook In Toto'** (specifically tributaries of the Brook);
2. **DAA Place ID 20058 'Temporary Camp' [Camp];**
3. **DAA Place ID 21393 'NOR/02 – Lightning Swamp';** and
4. **DAA Place ID 21620 'Chandala Brook'** (and, through association with **DAA's Complex 42, DAA Place ID 20008 'Gingin Brook Waggy Site'** and **DAA Place ID 20749 'Moore River Waugal'**).

The question remains as to whether there are other places that could reasonably be considered Aboriginal Sites that would be potentially affected by the PDNH.

The previously recorded and newly reported ethnographic places/features inside or adjacent to the PDNH Study Area fall into the following categories:

1. Watercourses (tributaries of Bennett Brook, Ellen Brook and its tributaries (including *Meenolun*), Chandala Brook and interconnected watercourses);
2. Wetlands (Lightning Swamp, Altone Road Wetland, Maralla Road Wetland, *Bodyadorling*);
3. Camping areas (Lightning Swamp and **'Temporary Camp'**); and
4. Plants and plant resources (Baal Street and Maralla Road Hilltop).

Places and features further outside the Study Area were also reported as a result of concerns that indirect impacts could occur through potential pollution of the interconnected waterways. The main example of this was Twin Swamps to the east of the PDNH. **Groundwater in general was also reported to be "sacred"** and part of Waugal mythology.

As noted, four of the above places/features are already registered Aboriginal sites (**DAA Place ID 3692 'Bennett Brook In Toto', DAA Place ID Chandala Brook, DAA Place ID 21393 Lightning Swamp and DAA Place ID 20058 'Temporary Camp'**), and Ellen Brook (DAA Place ID 3525) was formerly considered a registered **Aboriginal site but has been relegated to 'Lodged'**. The remaining places/features do not appear to have been reported previously and are therefore not listed on the AHIS. Below we consider the likelihood that they will be considered Aboriginal Sites under Section 5 **under the DAA/ACMC's current assessment regime**.

As discussed above, Section 5 of the AHA defines an Aboriginal Site as follows:

- a. any place of importance and significance where persons of Aboriginal descent have, or appear to have, left any object, natural or artificial, used for, or made or adapted for use for, any purpose connected with the traditional cultural life of Aboriginal people, past or present;*
- b. any sacred, ritual or ceremonial site, which is of importance and special significance to persons of Aboriginal descent;*
- c. any place which, in the opinion of the Committee,¹³ is or was associated with Aboriginal people and which is of historical, anthropological, archaeological or ethnographic interest and should be preserved because of its importance and significance to the cultural heritage of the State;*
- d. any place where objects to which the Act applies are traditionally stored, or to which, under the provisions of this Act, such objects have been taken or removed.*

In broad terms, Section 5(a) generally applies to archaeological sites (which are discussed separately in Hovingh & Ogilvie 2015); ethnographic sites are generally considered in relation to Section 5(b) (sacred, ritual and ceremonial); while places of such significance that they should be preserved for the benefit of the State are considered under Section 5(c). It is worth noting at this point that Ellen Brook (DAA Place ID 3525) was for a period of ten years considered a registered site under Sections 5(b) and 5(c) as a result of four ACMC resolutions between 1993 and 2003 until being considered to lack sufficient information to make a determination in 2009.

As also outlined above, Section 39(3) of the AHA gives primacy to “associated sacred beliefs, and ritual or ceremonial usage, in so far as such matters can be **ascertained**” in the ACMC’s evaluation of the importance of places and objects. In evaluating the importance of places and objects, the ACMC considers the following:

- a. any existing use or significance attributed under relevant Aboriginal custom;*
- b. any former or reported use or significance which may be attributed upon the basis of tradition, historical association or Aboriginal sentiment;*
- c. any potential anthropological, archaeological or ethnographical interest; and*
- d. aesthetic values.*

The DAA on its website provides definitions for common Aboriginal site types including the following:

¹³ The Aboriginal Cultural Material Committee (ACMC) whose role it is, among other functions, to evaluate on behalf of the community the importance of places and objects and to advise the Minister. The *Aboriginal Heritage Amendment Bill 2014* is seeking to transfer the assessment function of the ACMC to the Chief Executive Officer (CEO) of the DAA.

Mythological	"A place that is connected to the great spirit ancestors, in their various manifestations, of the 'Dreamtime' which continues to be important and of special significance to persons of Aboriginal descent".
Ceremonial	"A place used for a formal act or series of acts prescribed by ritual, belief in mythological manifestation, religious belief or observance, protocol or convention that is connected with the traditional cultural life of Aboriginal people past or present".
Historical	"A place that has historical associations with Aboriginal people and may or may not contain physical evidence of those associations". ¹⁴

The wetlands and watercourses in the vicinity of the PDNH, and even groundwater in general, were described by the Aboriginal consultants in general terms as being **"sacred"**, primarily through their association with the Waugal (a **"great spirit ancestor"**) and it was clear that, in the view of those consulted, they are sacred sites of importance and special significance. The belief that all **waterways and wetlands are "sacred"** is well documented in previous heritage surveys (see, for example, Lantzke & Hammond 1993:13; de Gand & Morse 2009:33). However, what is generally lacking in such reports is a **detailed 'code'** (Myers 1986) or **"set of rules"** (Trigger & Robinson 2001:113) or what Merlan describes as **"an elaborate Dreaming story"** which makes it difficult to distinguish between places of specific, importance and special significance distinct from their surroundings, and places of generalised significance.

A prominent Nyungar spokesperson who participated in the current research, in reporting disturbance along Bennett Brook to the DAA, recently **defined "sacred" as meaning** "important to us according to our Religion and Culture" (Source: DAA Site ID 3692).¹⁵ **Section 5(b) gives equal weighting to "sacred, ritual [and] ceremonial"**. The request that sand be thrown into the water to appease the Waugal in *Gynning* (Ellen Brook), and the reported similar request at Lightning Swamp during a previous survey, reflect **the DAA's own definition of a ceremonial site ("a formal act ... prescribed by ritual, ... religious belief or observance, protocol or convention that is connected with the traditional cultural life of Aboriginal people past or present")**. The same consultant referred to above explains that this ritual reflects the **"Winnarch [sacred]" nature of watercourses**, and reports that similar practices are performed at Bennett Brook. The consequences of not observing such rituals, and impacting on watercourses

¹⁴ <http://www.daa.wa.gov.au/en/Heritage-and-Culture/Aboriginal-heritage/Reporting-a-Site/Recording-Aboriginal-Sites/07-Type-of-Site/Definitions-and-descriptions-for-types-of-sites/>

¹⁵ The Macquarie Dictionary defines a 'sacred site' (in Australia) as "a site that is sacred to Aborigines or is otherwise of significance to Aboriginal tradition" (Macquarie Dictionary 1998).

“without first doing the proper things by the Spirits”, **include sickness** (Source: DAA Site ID 3692). The concern that impacts to sacred sites can lead to sickness, and even death, is encountered elsewhere in Aboriginal Australia.

On the face of it, therefore, Ellen Brook and the other watercourses might reasonably be considered Aboriginal Sites. However, it is increasingly the case that **generalised reports of significance are unlikely to satisfy the DAA/ACMC’s** current assessment regime which, as we have shown, is increasingly limiting the application of Section 5(b) of the AHA. In the absence of specific, detailed information concerning the mythological significance of wetlands and watercourses it is currently difficult to successfully make a case that they constitute places of importance and specific significance distinct from their surroundings, which is required by the DAA/ACMC in determining which places constitute Aboriginal Sites.

A review of previous reports also highlights the shift that has occurred over the past three decades in relation to the reporting by Aboriginal people of watercourses and their tributaries as Aboriginal **sites**. Whereas in early surveys they tended not to be reported as mythological sites per se, though their cultural significance was commented on (see, for example, O’Connor & Quartermaine 1987:2; McDonald & Murphy 1991:22), there has been a marked increase in the reporting of entire water systems, including main creeks and interconnecting tributaries, **as “sites” due to largely generalised Waugal associations. It is now common for reports along the lines of “all waterways are sacred”** (de Gand & Morse 2009:33) which was repeated during the current survey. Many of these reported features have become **registered sites or ‘other heritage places’ and even “complexes”** (e.g., Complex 42), though there appears to have been a **marked lack of consistency in terms of the DAA/ACMC’s assessment of the** available information with respect to Section 5 of the AHA.

As we have shown, the Waugal was not the only ancestral being associated with water and water sources, with Ellen Brook originally reported to be associated **with the mythical ‘turtle’**. Other creative ancestors include the ancestral dog/dingo [*dwert* or *doorda*] which was the creator of an important water source in New Norcia (*Nyeerrgu*) that laid down laws associated with the use of the water (Bates 1992/1927:177–79). However, it is rare now for ancestral beings other than the Waugal to be mentioned in relation to water in the context of heritage surveys.

Further, the Waugal’s relationship to particular aspects of a local hydrological system may now only be understood and expressed in a general sense. In other

words, specific mythological and locally-contexted narratives are generally absent, in contrast to the former, traditional situation. Increasingly, the Waugal is **now reported as being in 'everyplace' water is found, rather than in specific contexts**, or no longer existing in places where water has disappeared (McDonald, Coldrick & Christensen 2008:68; see also McDonald, Coldrick & Villiers 2005). Moreover, in some cases, it is water itself unmediated by the Waugal or other ancestral beings that is seen as being of cultural and spiritual importance. Indeed, it is becoming increasingly common for Nyungars to make statements such as: **"We believe in the spiritual aspects of water as part of the soul and being of Aboriginal culture and it should not be disturbed"; "It's the water that's ... significant"; "spirit is in the water – that's the rainbow snake" (Parker, Parker & Lantzke 2004:14)¹⁶; or more simply: "we worship *gabi*, the water" (McDonald 2011; McDonald & Coldrick 2013:18).¹⁷**

Although the spiritual importance of water to Nyungar people, or indeed its importance to the entire community and the environment, are not in question, it must therefore be concluded that despite their reported spiritual and environmental value, it is unlikely that the newly reported wetlands (Altone Road Wetland, Maralla Road Wetland, *Bodyadorling* and Twin Swamps) could reasonably be expected to be considered Aboriginal Sites within the meaning of s5(b) of the AHA at this time. However, they may be protected by environmental legislation and MRWA is encouraged to avoid impacting them if possible.

Both of the reported camping areas (**DAA Place ID 21393 'Lightning Swamp'** and **DAA Place ID 20058 'Temporary Camp'**) are registered sites and are therefore already considered places to which the Act applies. The Aboriginal consultants requested that registered sites be avoided if possible. **'Temporary Camp'** was reported to no longer be extant and no concerns were raised that the PNDH would impact the camping area further. However, the Act emphasises the importance of *place* and although this site has no official site type category allocated to it on the AHIS, it would seem to fit the definition of an historical site as outlined above. However, **reports that the groundwater in the area makes the place "sacred" are unlikely to support consideration as a "sacred site" under Section 5(b) for the reasons covered above.**

¹⁶ This statement was made by a senior Nyungar Elder in reference to the water in a manmade drain during a survey carried out by AIC in the City of Stirling. The drain (DAA Place ID 21538) has been **assessed by the ACMC as "not a site" under the AHA.**

¹⁷ McDonald, Coldrick & Christensen (2008) have observed that this increasing pattern at least to some extent reflects attenuated knowledge about the Dreaming, with discontinuities evident in the way significance is increasingly being read in *everyplace* rather than in specific 'story places'.

Similarly, the plants and plant resources in the vicinity of Baal Street and Maralla Road (primarily the ***Moojarr*** and Morrison bushes) are also highly unlikely to be considered Aboriginal Sites by the DAA/ACMC. However, where possible, such plants should be avoided or relocated in consultation with the relevant Aboriginal people.

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

The search of the Register of Aboriginal Sites revealed that the PDNH has the potential to impact the following registered ethnographic Aboriginal sites:

1. DAA Place ID 3692 'Bennett Brook In Toto' (specifically tributaries of the Brook);
2. DAA Place ID 20058 'Temporary Camp' [Camp];
3. DAA Place ID 21393 'NOR/02 – Lightning Swamp'; and
4. DAA Place ID 21620 'Chandala Brook' (and, through association with DAA's Complex 42, DAA Place ID 20008 'Gingin Brook Waggy Site' and DAA Place ID 20749 'Moore River Waugal').

The PDNH also has the potential to impact Ellen Brook (DAA Place ID 3525 'Ellen Brook: Upper Swan', a Lodged place) and its tributaries, which also form part of **DAA's Complex 42 along with** other lodged watercourses (DAA Place IDs 20650, 21616, 21617, 21618 and 21619).

The search of the AHIS also revealed one registered archaeological site (DAA Place ID 3180 'Marshall, Beechboro') and three (3) Lodged archaeological sites (DAA Place IDs 3618, 3619 and 21994) overlapping the Study Area. However, only DAA Place ID 21994 was found to be extant during the archaeological survey and was verified on the ground to be located outside the Study Area (Hovingh & Ogilvie 2015).

The majority of the Aboriginal consultants had no objections to the proposed PDNH as a whole, and several of the elders acknowledged the benefits of the project generally for the wider community. However, representatives of the Whadjuk Native Title Claimants and Swan River People (SRP) stated that the proposed alignment should avoid impacting registered Aboriginal sites wherever possible. The protection of the waterways and wetlands was the primary concern of the Aboriginal consultants, as these features have both environmental and interrelated cultural significance. The Aboriginal consultants requested that wherever waterways and wetlands cannot be avoided that MRWA should go over them (using bridges, culverts etc.) and that other measures such as pollutant traps should be used to avoid impacts on water quality.

Little in the way of 'new' information was provided in relation to the previously recorded places, though the Waugal was reported to be particularly powerful in Ellen Brook (*Gynning*). A number of previously unreported places and features were reported during the field surveys/consultations including wetlands near

Altone Road, near the corner of Warbrook Road and Raphael Road (*Bodyadorling*) and near Maralla Road. A turtle sanctuary at Twin Swamps to the east of the PDNH was also reported, with concerns raised that pollution from the PDNH could find its way there. A *Moojarr* (native Christmas tree) was identified by the SRP on a hilltop along Maralla Road which they requested either be avoided or be moved. A tributary of Ellen Brook, at the corner of Neaves Road and Davidson Street, was reported to be known as *Meenolun* though this is already mapped as part of this Lodged place (DAA Place ID 3525). Other places outside the PDNH were also reported.

The Swan River People also declared the area surrounding Baal Street to be a **"sacred area" due to the presence of Morrison bushes and native Christmas trees (*Moojarr*)**. It was also reported by another Aboriginal consultant unaffiliated with this group that the bush along Beechboro Road was used as hunting grounds. **However, the SRP's primary objection to the PDNH in this area was their contention that "Aboriginal land" would be taken away from the Cullacabardee community.**

Cedric Jacobs reported that the presence of groundwater at the PDNH/Tonkin Highway/Reid Highway Interchange made **the whole area "sacred"**. However, the former camping area here (DAA Place ID 20058) was reported to be no longer extant, having been destroyed in the 1990s. Aboriginal consultants requested that the modified wetlands here be retained and that the large trees in the area be avoided if possible. Monitoring was also requested, along with recognition of the camping area through interpretation and design elements.

Some of the Aboriginal consultants also raised concerns that clearance of vegetation (which they consider to be a part of their heritage) may further reduce habitats for native fauna, and requested to be given the results of the fauna surveys and to be kept informed about the potential environmental impacts of the proposed works.

As far as can be ascertained, no ethnographic Aboriginal sites apart from the places referred to above have been identified inside the PDNH study area as a result of previous surveys. Brown (1983:13), drawing on Robinson (1976), refers to graves in the vicinity of Widgee Road. However, these were never located (Coldrick, Hovingh & McDonald 2014:46). A traditional burial(s) was reported during the current survey inside the grounds of the Keith Maine Centre, outside and to the east of the PDNH.

In conclusion, it is considered likely that Section 18 consent will be required for works inside the boundaries of the registered ethnographic sites (DAA Place ID 3692 **'Bennett Brook: In Toto'**; DAA Place ID 20058 **'Temporary Camp'**; DAA Place ID 21393 **'Lightning Swamp'**; and DAA Place ID 21620 **'Chandala Brook'**) and potentially for **Lodged place DAA Place ID 3525 'Ellen Brook: Upper Swan'**. It is considered unlikely that any of the newly reported ethnographic places/features would be considered Aboriginal Sites as defined by Section 5 of the AHA under the DAA/ACMC's **current** assessment regime. However, MRWA is encouraged to avoid or mitigate impacts to these places/features where possible. Other controls (for example, environmental legislation) may exist to protect and/or manage some of these values, in particular the watercourses and wetlands.

The Aboriginal consultants were satisfied with the process and findings of the archaeological survey which identified two previously unreported archaeological sites (**'NorthLink 14-01'** and **'NorthLink 14-02'**) along the edge of the Study Area and one previously recorded place (DAA Place ID 21994 **'Neaves Road Creek Field Site 01'**) was also found to lie outside the Study Area, though is currently incorrectly mapped by the DAA as overlapping it (Hovingh & Ogilvie 2015). The Aboriginal consultants requested steps to be taken to ensure that these sites are not impacted and that access to these sites is not cut off as a result of the highway. Further consultation should take place in the event that any of these sites needs to be impacted in the future.

With respect to the registered archaeological site DAA Place ID 3180 (**'Marshall, Beechboro'**) and the Lodged artefact scatters (DAA Place ID 3618 **'Whitemans Cutting'** and DAA Place ID 3619 **'Whitemans Quarry'**), the Aboriginal consultants acknowledged that these sites had been developed/destroyed and raised no particular concerns about further impacts from the PDNH.

The key findings of the assessment are outlined in tabular form in Table 9.

6.2 Recommendations

1. It is recommended that the proposed PDNH proceed subject to Ministerial consent under Section 18 of the AHA as required;
2. It is recommended that MRWA avoid impacting the places/features reported by the Aboriginal consultants wherever possible;
3. It is recommended that MRWA minimise impacts to native flora and that where possible significant plants such as native Christmas trees (*Moojarr*) and Morrison bushes should be relocated in consultation with the relevant Aboriginal people; and
4. It is recommended that MRWA note the concerns of the Aboriginal community in relation to the potential environmental impacts of the

project, and that further information on these matters be provided to the relevant parties as requested.

Additional recommendations are made in the archaeological report in relation to the identification and management of known and potential archaeological sites and material, including burials (Hovingh & Ogilvie 2015).

Place/Feature	DAA Place ID	Desktop Findings	Fieldwork Findings	AHA Status	Implications for PDNH
Baal Street	N/A	Not listed on the AHIS or identified during the desktop research	The Swan River People declared the area surrounding Baal Street to be a "sacred area" due to the presence of Morrison bushes and native Christmas trees (Moojarr) . It was also reported that the bush along Beechboro Road was used as hunting grounds. However, the SRP's primary objection to the PDNH in this area was their contention that "Aboriginal land" would be taken away from the Cullacabardee community.	N/A	Unlikely to be considered an Aboriginal Site as defined by s.5 under the DAA/ACMC's current assessment regime.
Bennett Brook	3692	Two tributaries of Bennett Brook which are mapped as part of the registered site intersect the Study Area to the west of Beechboro Road, north of Hepburn Avenue.	The tributaries along Beechboro Road were not specifically referred to by the Aboriginal consultants during the survey. However, other tributaries along Reid Highway that are not currently mapped as part of the site were pointed out to connect with the brook. The Aboriginal consultants requested that there be no impacts to wetlands and watercourses generally, or to the water quality of these features, and that MRWA go over such features (using bridges, culverts etc.) where necessary to avoid impacts.	Registered Site	Section 18 consent may be required
Bodyadorling	N/A	Not listed on the AHIS or identified during the desktop research	Small wetland supporting a variety of animal and bird life near the corner of Warbrook Road and Raphael Road, approximately 120m east of the PDNH. Concerns were raised that, due to its proximity, pollution from the PDNH could enter this wetland and also find its way to the Twin Swamps turtle sanctuary. The Aboriginal consultants requested that there be no impacts to wetlands and watercourses generally, or to the water quality of these features.	N/A	Unlikely to be considered an Aboriginal Site as defined by s.5 under the DAA/ACMC's current assessment regime.

Place/Feature	DAA Place ID	Desktop Findings	Fieldwork Findings	AHA Status	Implications for PDNH
Chandala Brook	21620	Registered watercourse which connects with Ellen Brook (DAA Place ID 3525) at Muchea. Part of DAA Complex 42 which also includes a number of other watercourses with different statuses under s.5 including registered sites DAA Place ID 20008 'Gingin Brook Waggyi Site' and DAA Place ID 20749 'Moore River Waugal' and lodged places DAA Place IDs 20650, 21616, 21617, 21618 and 21619. The PDNH will cross Chandala Brook.	The Aboriginal consultants requested that there be no impacts to wetlands and watercourses generally, or to the water quality of these features, and that MRWA go over such features (using bridges, culverts etc.) where necessary to avoid impacts.	Registered Site	Section 18 consent may be required
Ellen Brook	3525	Ellen Brook (<i>Gynning</i>) is a watercourse recorded to be spiritually and environmentally associated with the 'turtle' . The watercourse and its tributaries are also associated with the Waugal. The PDNH will cross the main watercourse and several of its tributaries.	The previously reported values of <i>Gynning</i> were confirmed, and the Waugal was reported to be particularly powerful in this waterway. The Aboriginal consultants requested that there be no impacts to wetlands and watercourses generally, or to the water quality of these features, and that MRWA go over such features (using bridges, culverts etc.) where necessary to avoid impacts.	Lodged	Section 18 consent may be required
Maralla Road Hilltop and Wetland	N/A	Not listed on the AHIS or identified during the desktop research	Large <i>Moojarr</i> (native Christmas tree) which the SRP requested either be avoided or be moved, and other plants on a hilltop along Maralla Road. The nearby swamp was reported to drain into a turtle sanctuary at Twin Swamps to the east of the PDNH.	N/A	Unlikely to be considered an Aboriginal Site as defined by s.5 under the DAA/ACMC's current assessment regime.
Lightning Swamp	21393	Wetland and surrounding bush reported to have multiple ethnographic values. The Study Area marginally intersects the site's boundary.	While the majority of the Aboriginal consultants acknowledged that the overlap with the registered site was minor and would not pose a major threat to the site, some requested that the integrity of the site boundary be respected to avoid cumulative impacts over time. The Study Area has been amended since the fieldwork took place and the overlap is now negligible.	Registered Site	Section 18 consent may be required for works inside the site's boundary

Place/Feature	DAA Place ID	Desktop Findings	Fieldwork Findings	AHA Status	Implications for PDNH
Meenolun	3525	Creek mapped by the DAA as part of DAA Place ID 3525 'Ellen Brook: Upper Swan'	Creek at the corner of Neaves Road and Davidson Street, reported by Mr Corunna as Meenolun . Concerns that if the highway crosses Meenolun it might impact the water quality of Gynning (Ellen Brook). The Aboriginal consultants requested that there be no impacts to wetlands and watercourses generally, or to the water quality of these features, and that MRWA go over such features (using bridges, culverts etc.) where necessary to avoid impacts.	Lodged	Part of DAA Place ID 3525 'Ellen Brook: Upper Swan'; Section 18 consent may be required
Temporary Camp	20058	Former camping area inside the proposed PDNH/Tonkin/Reid Highway Interchange. Destroyed in the 1990s.	Consultations revealed that this site is no longer extant. However, the presence of groundwater was reported to make the whole area "sacred" . Aboriginal consultants requested that the modified wetlands be retained and that the large trees in the area be avoided if possible. Monitors also requested, along with recognition of the camping area through interpretation and design elements.	Registered Site	Section 18 consent may be required Unlikely to be considered a sacred site under s.5(b) under the DAA/ACMC's current assessment regime.

Table 9: Places/features of reported ethnographic significance inside the PDNH Study Area ¹⁸

¹⁸ Places concluded to lie outside the Study Area and places previously determined by the ACMC not to be Aboriginal Sites are not included here, nor are archaeological sites which are considered separately in Hovingh & Ogilvie 2015.

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APPENDIX 1: AHIS SEARCH RESULTS



Search Criteria

8 Registered Aboriginal Sites in Shapefile - DevelopmentEnvelope_20150330

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Terminology (NB that some terminology has varied over the life of the legislation)

Place ID/Site ID: This is a unique ID assigned by the Department of Aboriginal Affairs to the place

Status:

- o **Registered Site:** The place has been assessed as meeting Section 5 of the *Aboriginal Heritage Act 1972*
- o **Other Heritage Place which includes:**
 - **Stored Data / Not a Site:** The place has been assessed as not meeting Section 5 of the *Aboriginal Heritage Act 1972*
 - **Lodged:** Information has been received in relation to the place, but an assessment has not been completed at this stage to determine if it meets Section 5 of the *Aboriginal Heritage Act 1972*

Access and Restrictions:

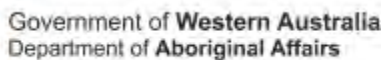
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 - **No Restrictions:** Anyone can view the information.
 - **Male Access Only:** Only males can view restricted information.
 - **Female Access Only:** Only females can view restricted information

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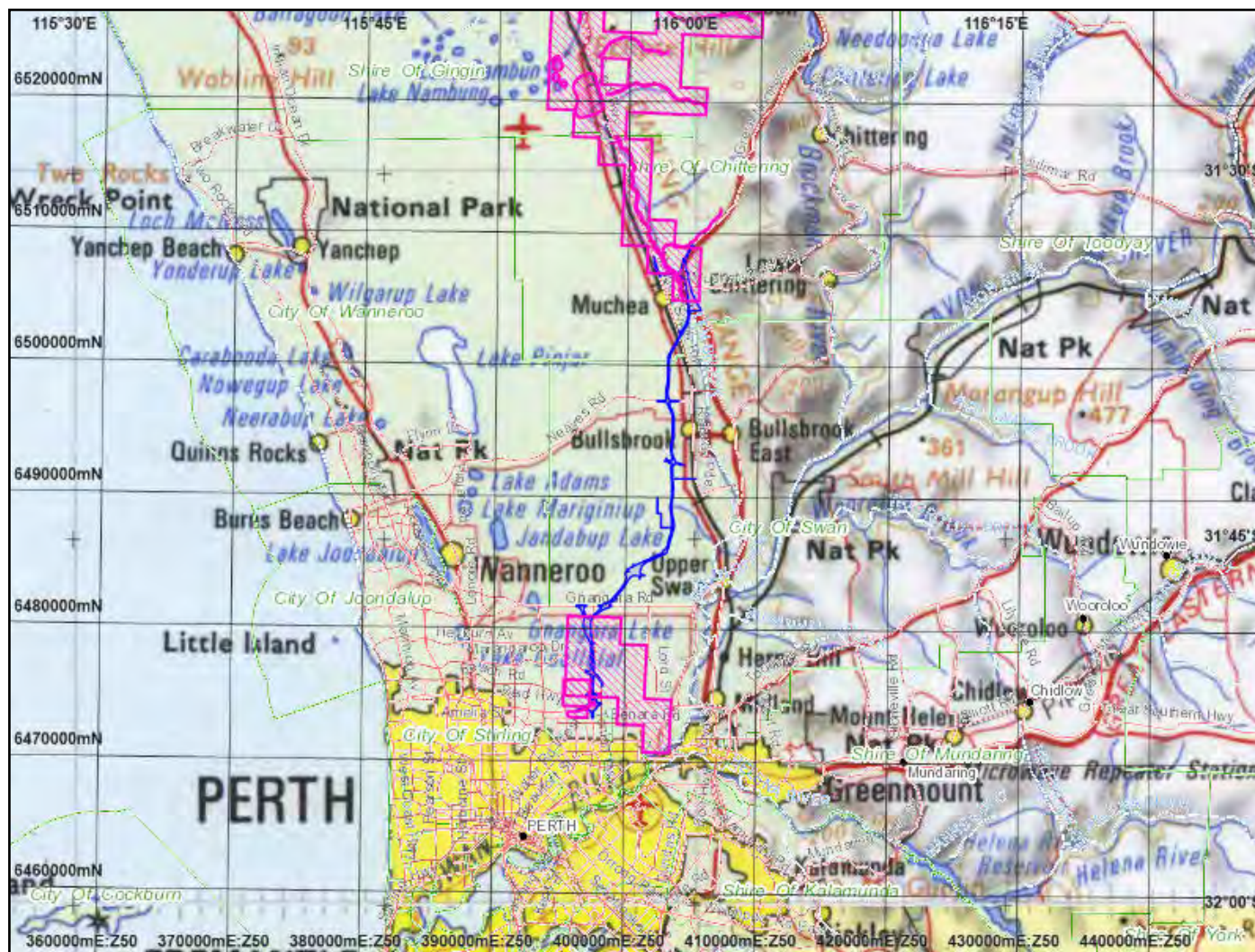


List of Registered Aboriginal Sites with Map

Site ID	Site Name	File Restricted	Boundary Restricted	Restrictions	Status	Site Type	Knowledge Holders	Coordinates	Legacy ID
3180	MARSHALL, BEECHBORO	No	No	No Gender Restrictions	Registered Site	Artefacts / Scatter	*Registered Knowledge Holder names available from DAA	398159mE 6475079mN Zone 50 [Reliable]	S00706
3426	SOUTH BALLAJURA CAMP.	Yes	Yes	No Gender Restrictions	Registered Site		*Registered Knowledge Holder names available from DAA	Not available when location is restricted	S02728
3692	BENNETT BROOK: in toto	Yes	Yes	No Gender Restrictions	Registered Site	Mythological	*Registered Knowledge Holder names available from DAA	Not available when location is restricted	S02254
20008	Gingin Brook Waggy Site	Yes	Yes	No Gender Restrictions	Registered Site	Historical, Mythological	*Registered Knowledge Holder names available from DAA	Not available when location is restricted	
20058	Temporary Camp	No	No	No Gender Restrictions	Registered Site		*Registered Knowledge Holder names available from DAA	397713mE 6474287mN Zone 50 [Reliable]	
20749	MOORE RIVER WAUGAL	No	No	No Gender Restrictions	Registered Site	Mythological	*Registered Knowledge Holder names available from DAA	389582mE 6549648mN Zone 50 [Reliable]	
21393	NOR/02 - Lightning Swamp	No	No	No Gender Restrictions	Registered Site	Ceremonial, Mythological	*Registered Knowledge Holder names available from DAA	396525mE 6473553mN Zone 50 [Reliable]	
21620	Chandala Brook	No	No	No Gender Restrictions	Registered Site	Mythological	*Registered Knowledge Holder names available from DAA	389626mE 6549540mN Zone 50 [Reliable]	



Aboriginal Sites Database



Selected Heritage Sites

-  Registered Sites
-  Aboriginal Community Occupied
-  Aboriginal Community Unoccupied
-  Town
-  Search Area

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Search Criteria

15 Other Heritage Places in Shapefile - DevelopmentEnvelope_20150330 (2)

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 - **Female Access Only:** Only females can view restricted information

Legacy ID: This is the former unique number that the former Department of Aboriginal Sites assigned to the place. This has been replaced by the Place ID / Site ID.



List of Other Heritage Places with Map

ID	Place Name	File Restricted	Boundary Restricted	Restrictions	Status	Type	Knowledge Holders	Coordinates	Legacy ID
3525	ELLEN BROOK: UPPER SWAN	Yes	Yes	No Gender Restrictions	Lodged	Mythological	*Registered Knowledge Holder names available from DAA	Not available when location is restricted	S02516
3552	MARSHALL/DELLA ROADS.	No	No	No Gender Restrictions	Stored Data / Not a Site	Artefacts / Scatter	*Registered Knowledge Holder names available from DAA	397339mE 6474899mN Zone 50 [Unreliable]	S02435
3618	WHITEMANS CUTTING	No	No	No Gender Restrictions	Lodged	Artefacts / Scatter	*Registered Knowledge Holder names available from DAA	397805mE 6476459mN Zone 50 [Reliable]	S02356
3619	WHITEMANS QUARRY	No	No	No Gender Restrictions	Lodged	Artefacts / Scatter	*Registered Knowledge Holder names available from DAA	398331mE 6475944mN Zone 50 [Unreliable]	S02357
4099	BEECHBORO ROAD	No	No	No Gender Restrictions	Stored Data / Not a Site	Artefacts / Scatter	*Registered Knowledge Holder names available from DAA	398299mE 6475499mN Zone 50 [Unreliable]	S01285
18735	Beechboro Camping Area	No	No	No Gender Restrictions	Stored Data / Not a Site		*Registered Knowledge Holder names available from DAA	398049mE 6474394mN Zone 50 [Unreliable]	
19138	Wetlands & Watercourses Moore River to Bullsbrook	No	No	No Gender Restrictions	Stored Data / Not a Site	Mythological	*Registered Knowledge Holder names available from DAA	396128mE 6561778mN Zone 50 [Reliable]	
19183	Red Gully Creek	No	No	No Gender Restrictions	Stored Data / Not a Site	Mythological	*Registered Knowledge Holder names available from DAA	396128mE 6561778mN Zone 50 [Reliable]	



Aboriginal Heritage Inquiry System


Aboriginal Sites Database

ID	Place Name	File Restricted	Boundary Restricted	Restrictions	Status	Type	Knowledge Holders	Coordinates	Legacy ID
20650	Lennard Brook	No	No	No Gender Restrictions	Lodged	Mythological	*Registered Knowledge Holder names available from DAA	389582mE 6549648mN Zone 50 [Reliable]	
21392	NOR/03 - Creek	No	No	No Gender Restrictions	Stored Data / Not a Site	Mythological	*Registered Knowledge Holder names available from DAA	397338mE 6473454mN Zone 50 [Reliable]	
21616	Boonanarring Brook	No	No	No Gender Restrictions	Lodged	Mythological	*Registered Knowledge Holder names available from DAA	396128mE 6561778mN Zone 50 [Reliable]	
21617	Wallering Brook	No	No	No Gender Restrictions	Lodged	Mythological	*Registered Knowledge Holder names available from DAA	396128mE 6561778mN Zone 50 [Reliable]	
21618	Nullilla Brook	No	No	No Gender Restrictions	Lodged	Mythological	*Registered Knowledge Holder names available from DAA	396128mE 6561778mN Zone 50 [Reliable]	
21619	Breera Brook	No	No	No Gender Restrictions	Lodged	Mythological	*Registered Knowledge Holder names available from DAA	396128mE 6561778mN Zone 50 [Reliable]	
21994	Neaves Road Creek Field Site 01	No	No	No Gender Restrictions	Lodged	Artefacts / Scatter	*Registered Knowledge Holder names available from DAA	403418mE 6497353mN Zone 50 [Reliable]	



Legend

Selected Heritage Places

-  Other Heritage Places
-  Aboriginal Community Occupied
-  Aboriginal Community Unoccupied
-  Town
-  Search Area

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APPENDIX 2: PREVIOUS SURVEYS



Search Criteria

42 Heritage Surveys containing 44 Survey Areas in Shapefile - DevelopmentEnvelope_20150330

Disclaimer

Heritage Surveys have been mapped using information from the reports and / or other relevant data sources. Heritage Surveys consisting of small discrete areas may not be visible except at large scales. Reports shown may not be held at DAA. Please consult report holder for more information. Refer to www.daa.wa.gov.au/heritage for information on requesting reports held by DAA.

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Access

Some reports are restricted.

Spatial Accuracy

The following legend strictly applies to the spatial accuracy of heritage survey boundaries as captured by DAA.

Very Good	Boundaries captured from surveyed titles, GPS (2001 onwards) submitted maps georeferenced to within 20m accuracy.
Good / Moderate	Boundaries captured from GPS (pre 2001) submitted maps georeferenced to within 250m accuracy.
Unreliable	Boundaries captured from submitted maps georeferenced to an accuracy exceeding 250m.
Indeterminate	Surveys submitted with insufficient information to allow boundary capture.



Survey Report 17059

Title Dampier to Perth Natural Gas Pipeline Route: A Survey for Aboriginal Sites. March 1979.
Authors Dept of Aboriginal Sites.
Lead Consultant Department of Aboriginal Sites, Western Australian Museum
Survey Types Archaeological and Ethnographic

Related Survey Areas for Survey Report 17059

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Archaeological and Ethnographic	The survey area consists of the 1486km preferred route of the Dampier to Perth Natural Gas Pipeline. The survey extended from Dampier to Wagerup. The width of the survey corridor is not known. A default 5m width, either side of the centreline is assumed.	Unreliable	Field and Desktop

Survey Report 18777

Title Report on archaeological investigation for Aboriginal and Heritage sites Hepburn Avenue extension
Authors Quartermaine, Gary.
Lead Consultant Quartermaine Consultants
Survey Types Archaeological

Related Survey Areas for Survey Report 18777

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Archaeological	Proposed extension to Hepburn Avenue from Alexander Drive, Ballajura, to Marshall Road, Malaga. This involves an alignment of 5.8km with a corridor width of 60 to 100m as shown in Fig. 2	Good	Field and Desktop



Survey Report 18799

Title Consultation with the Combined Metropolitan Working Group and Rev. Jacobs Group regarding the proposed extension to Hepburn Avenue

Authors Hart, Ted

Lead Consultant Ted Hart

Survey Types Ethnographic

Related Survey Areas for Survey Report 18799

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Ethnographic	Proposed extension to Hepburn Avenue from Alexander Drive to Marshall Road in Ballajura as shown in Fig. 1.1	Good	Field and Desktop

Survey Report 18800

Title Report on an ethnographic survey of the proposed extension to Hepburn Avenue from Alexander Drive to Marshall Road

Authors O'Connor, R

Lead Consultant R & E O'Connor Pty Ltd

Survey Types Ethnographic

Related Survey Areas for Survey Report 18800

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Ethnographic	Extension to Hepburn Avenue from Alexander Drive to Marshall Road, Perth, Western Australia.	Good	Field and Desktop



Survey Report 19292

Title Report on an ethnographic survey of proposed roadworks between Marshall Road and Reid Highway / Tonkin Highway Junction

Authors O'Connor, R

Lead Consultant R. O'Connor

Survey Types Ethnographic

Related Survey Areas for Survey Report 19292

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Ethnographic	Proposed roadworks between Marshall Road and Reid Highway/Tonkin Highway Junction as shown in Fig. 1	Very Good	Field and Desktop

Survey Report 19293

Title Consultation with combined Metropolitan Working Group regarding proposed roadworks at Marshall Road

Authors Hart, Ted

Lead Consultant Ted Hart

Survey Types Ethnographic

Related Survey Areas for Survey Report 19293

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Ethnographic	Proposed Roadworks between Marshall Road and the Tonkin Highway/Reid Highway intersection in Ballajura and Malaga as shown in Fig. 1	Very Good	Field and Desktop



Survey Report 20633

Title Management report of Aboriginal Heritage aspects of the Dampier to Bunbury Natural Gas Pipeline corridor through the Perth Metropolitan Area

Authors Hames Consultancy Group

Lead Consultant Australian Interaction Consultants

Survey Types Archaeological and Ethnographic

Related Survey Areas for Survey Report 20633

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Archaeological and Ethnographic	Dampier to Bunbury Natural Gas Pipeline corridor, Bullsbrook to Postans, an alignment 70km long by 30m wide as shown in Sheets 1 & 2	Good	Field and Desktop

Survey Report 21065

Title Report on an archaeological survey of the proposed Noranda regional recreation complex section 18 consultation under the Aboriginal Heritage Act (1972)

Authors Australian Interaction Consultants

Lead Consultant Australian Interaction Consultants

Survey Types Archaeological

Related Survey Areas for Survey Report 21065

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Archaeological	Lot 102 Della Road, which is presently vacant land between Della Road and Tonkin and Reid Highway.	Very Good	Field only



Survey Report 21066

Title Section 18 application under the Aboriginal Heritage Act (1972) for the development of the Noranda regional recreation complex.

Authors Hames Consultancy Group

Lead Consultant Australian Interaction Consultants

Survey Types Archaeological and Ethnographic

Related Survey Areas for Survey Report 21066

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Archaeological and Ethnographic	Lot 102 Della Road, Noranda.	Very Good	Field only

Survey Report 21088

Title A Socio-economic Anthropological Survey of People of Aboriginal Descent in the Metropolitan Region of Perth, Western Australia

Authors Makin, C F

Lead Consultant C. Makin

Survey Types Ethnographic

Related Survey Areas for Survey Report 21088

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Ethnographic	Metropolitan Region of Perth as shown in Figs. 1 and 2.	Very Good	Field and Desktop



Survey Report 21521

Title The report of an Aboriginal Heritage assessment of the Ellen Brook Constructed Wetland Project, Bullsbrook, Perth

Authors De Gand, Daniel

Lead Consultant Archae-aus Pty Ltd

Survey Types Archaeological and Ethnographic

Related Survey Areas for Survey Report 21521

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Archaeological and Ethnographic	Ellen Brook Constructed Wetland Project, Bullsbrook. Two distinct areas defined as Neaves Road and Strachan Road as shown in Figures 2 and 3.	Very Good	Field and Desktop

Survey Report 21633

Title Perth - Darwin National Highway - alignment definition study : indigenous Heritage issues report filed survey and consultation : Southern section - Maralla Road to the MRS Boundary

Authors GHD

Lead Consultant Quartermaine Consultants

Survey Types Archaeological and Ethnographic

Related Survey Areas for Survey Report 21633

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Archaeological and Ethnographic	The proposed area is situated in the North-East Metropolitan Area of Perth. It involves the Marella Road to the MRS Boundary Section of the Perth Darwin National Highway. This section is approximately 12.50km in length within a 500m corridor. As shown in Figures 1 & 2a-b	Very Good	Field and Desktop



Survey Report 21634

Title Perth - Darwin National Highway - alignment definition study : indigenous Heritage issues report filed survey and consultation : Northern section - MRS Boundary to Calingiri Road

Authors GHD

Lead Consultant Quartermaine Consultants

Survey Types Archaeological and Ethnographic

Related Survey Areas for Survey Report 21634

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Archaeological and Ethnographic	Northern Section - MRS Boundary to Calingiri Road. Corridor width of 500m.	Very Good	Field and Desktop

Survey Report 21817

Title Ballaruk (traditional owners) Aboriginal site recording project

Authors Machin, Barrie

Lead Consultant Tamora Pty Ltd

Survey Types Ethnographic

Related Survey Areas for Survey Report 21817

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Ethnographic	Whadjuk territorial boundaries the lands of the Ballaruk Peoples as shown in Figure 10.	Unreliable	Field and Desktop



Survey Report 21818

Title Ballaruk (traditional owners of Whadjuk territorial boundaries the lands of the Ballaruk Peoples) Aboriginal site recording project : additional material

Authors Machin, Barrie

Lead Consultant Tamora Pty Ltd

Survey Types Ethnographic

Related Survey Areas for Survey Report 21818

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Ethnographic	Whadjuk territorial boundaries the lands of the Ballaruk Peoples as shown in Figure 10.	Unreliable	Field and Desktop

Survey Report 21909

Title Study of groundwater - related Aboriginal Cultural Values on the Gngangara Mound, Western Australia

Authors McDonald Edward

Lead Consultant Estill and Associates

Survey Types Ethnographic

Related Survey Areas for Survey Report 21909

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Ethnographic	The Gngangara Mound area as shown in Figure 2 of the Fisher report attached as appendix 3 to the Estill report.	Very Good	Field and Desktop



Survey Report 21948

Title Report on an ethnographic survey of proposed road widening and passing lane areas between SLK 37.20 and SLK 146 Great Northern Highway

Authors R & E O'Connor Pty Ltd

Lead Consultant Rory O'Connor & Associates Pty Ltd

Survey Types Ethnographic

Related Survey Areas for Survey Report 21948

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Ethnographic	Road widening and passing lane areas between SLK 37.20 and SLK 146, Great Northern Highway, between Muchea and Walebing, Western Australia	Good	Field and Desktop

Survey Report 21949

Title Report on further archaeological investigations for Aboriginal Sites Great Northern Highway H0006 Muchea to Walebing Road widening programme

Authors Quartermaine, Gary.

Lead Consultant Quartermaine Consultants

Survey Types Archaeological

Related Survey Areas for Survey Report 21949

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Archaeological	Great Northern Highway road widening project, between Muchea and Walebing, Western Australia. It involves a survey corridor of fifty metres on each side of the highway at several sections.	Good	Field and Desktop



Survey Report 22338

Title Report on a section 18 consultation of the Department of Fisheries proposed plan to control and eradicate introduced feral fish within Bennett Brook, Western Australia

Authors Australian Interaction Consultants

Lead Consultant Australian Interaction Consultants

Survey Types Ethnographic

Related Survey Areas for Survey Report 22338

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Ethnographic	Bennett Brook Catchment Area, Western Australia	Moderate	Field and Desktop

Survey Report 22789

Title Aboriginal Heritage Surveys & Section 18 consultation proposed road upgrade works near Muchea

Authors Mattner, Joe

Lead Consultant Artefaxion Pty Ltd

Survey Types Archaeological and Ethnographic

Related Survey Areas for Survey Report 22789

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Archaeological and Ethnographic	The proposed road upgrade is located at the intersection of Great Northern Highway with Brand Highway and Muchea East Road.	Moderate	Field and Desktop



Survey Report 23894

Title Site Identification Survey Report of the Proposed Lighting Swamp Boardwalk Installation at Noranda Western Australia

Authors Australian Interaction Consultants

Lead Consultant Australian Interaction Consultants

Survey Types Archaeological and Ethnographic

Related Survey Areas for Survey Report 23894

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Archaeological and Ethnographic	The survey area comprised two areas within the Lightning Swamp Bushland. The first area is a 100m long, 5m wide corridor following the path of the Boardwalk, and the second is a 20m ² area around three groundwater monitoring bores.	Good	Field and Desktop

Survey Report 24064

Title Ethnographic and Archaeological Heritage Assessment: Final Report: Metropolitan Area Indigenous Groups. Whiteman Park Project

Authors Big Island Research

Lead Consultant Big Island Research Pty Ltd

Survey Types Archaeological and Ethnographic

Related Survey Areas for Survey Report 24064

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Archaeological and Ethnographic	The proposed project area is located on the Swan Coastal Plain immediately south of Whiteman Park in the Perth suburb of Beechboro.	Good	Field and Desktop



Survey Report 101889

Title Report on an ethnographic and archaeological survey for the proposed Ellenbrook sewerage pressure main route to Malaga

Authors Macintyre Dobson & Associates Pty Ltd

Lead Consultant Macintyre Dobson & Associates Pty Ltd

Survey Types Archaeological and Ethnographic

Related Survey Areas for Survey Report 101889

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Archaeological and Ethnographic	Proposed Ellenbrook sewerage pressure main route to Malaga. The survey corridor is 16.6km long from Alexander Drive in Malaga to the intersection of Lord Street and Gngara Road Ellenbrook as shown in Fig. 1	Good	Field and Desktop

Survey Report 102230

Title A summary of the research on Aboriginal sites on the Ellenbrook Estate and the Aboriginal consultative process

Authors McDonald, E M

Lead Consultant McDonald, Hales and Associates Pty Ltd

Survey Types Archaeological and Ethnographic

Related Survey Areas for Survey Report 102230

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Archaeological and Ethnographic	Ellenbrook Estate is located in the Upper Swan area north of Gngara Road as shown in Fig. 1	Good	Field and Desktop



Survey Report 102670

Title Preliminary Report on the Survey of Aboriginal Areas of Significance in the Perth Metropolitan & Murray River Regions July 1985.

Authors O'Connor, R

Lead Consultant C. Bodney

Survey Types Ethnographic

Related Survey Areas for Survey Report 102670

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Ethnographic	Perth Metropolitan & Murray River Regions. A roughly triangular region, with Yanchep National Park as the Northern point, Gidgegannup as the Eastern point and Pinjarra as the Southern point.	Indeterminate	Field and Desktop



Survey Report 103243

Title Aboriginal site survey : report on an archaeological survey for Aboriginal sites at the proposed Homeswest housing development part locations I and K, Ballajura

Authors Quartermaine G

Lead Consultant Gary Quartermaine

Survey Types Archaeological

Related Survey Areas for Survey Report 103243

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Archaeological	Proposed Homeswest Housing Development Part Locations I and K, Ballajura. The proposed development involves approximately 119.7 ha of land on the northern side of Marshall Road, west of the Proposed Tonkin Highway and south of Harrow Road as shown in Fig. 1	Moderate	Field and Desktop

Survey Report 103265

Title Report of a Preliminary Study for Aboriginal Sites at Proposed Cliffs International Ltd Developments at Coolup and Bullsbrook, WA. February 1986.

Authors Quartermaine G

Lead Consultant Gary Quartermaine

Survey Types Archaeological

Related Survey Areas for Survey Report 103265

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Archaeological	The survey area comprises a proposed Charcoal Production Plant site, near Coolup; and proposed Silicon Plant site, near Bullsbrook, as per Figures 1 and 2.	Very Good	Field and Desktop



Survey Report 103372

Title Report of an archaeological survey of a proposed subdivision, east Malaga (T.P.S. 14), Western Australia

Authors Veth, Peter.

Lead Consultant University of Western Australia

Survey Types Archaeological

Related Survey Areas for Survey Report 103372

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Archaeological	Proposed subdivision, East Malaga (TPS 14). The proposed development covers an area of approximately 2sq.km and is flanked by Marshall Road to the north, Delta Road to the east and North Perimeter Highway to the south. The western boundary is located approximately 700m west from Malaga Road as shown in Fig. 1	Very Good	Field and Desktop



Survey Report 103564

Title An Archaeological Survey Project: The Perth Area, Western Australia. Apr 1972.
Authors University of Western Australia.
Lead Consultant University of Western Australia
Survey Types Archaeological

Related Survey Areas for Survey Report 103564

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Archaeological	The Perth Area. 103 site locations in 67 site groups were investigated.	Indeterminate	Field and Desktop
2	Archaeological	The Perth Area. Sites included id's 3350, 4404, 3846	Unreliable	Field and Desktop
3	Archaeological and Ethnographic	The Perth Area. Closed site id 2887	Indeterminate	Field and Desktop



Survey Report 103697

Title Report on an Ethnographic Survey of the Ellenbrook Pressure Main. Nov.1997.
Authors O'Connor, R. & E.
Lead Consultant R. & E. O'Connor Pty Ltd
Survey Types Ethnographic

Related Survey Areas for Survey Report 103697

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Ethnographic	Ellenbrook Pressure Main. The route covers a total of approximately 14km of corridor between Woollybush Road in Ellenbrook and Hartman Drive in Wangara. A 200m wide corridor centred upon the existing Gngangara Road was surveyed as shown in Fig. 1	Very Good	Field only



Survey Report 103700

Title Addendum to a Report of an Aboriginal Heriatge Survey. Proposed Perth-Darwin Highway, Lord Street Extensions, Ellenbrook Gnaragara Road to Maralla Road Section. October 1995.

Authors Blockley, E. & Lantzke, D.

Lead Consultant McDonald, Hales and Associates Pty Ltd

Survey Types Ethnographic

Related Survey Areas for Survey Report 103700

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
2	Ethnographic	Proposed Perth-Darwin Highway, Lord St. Extensions, Ellenbrook Gnaragara Road to Maralla Road Section. A corridor of 250m either side of the centreline was surveyed as shown in Fig. 1-1	Very Good	Field and Desktop
1	Archaeological	Proposed Perth-Darwin Highway, Lord St. Extensions, Ellenbrook Gnaragara Road to Maralla Road Section. A corridor of 130m either side of the centreline was surveyed as shown in Fig. 1-1	Very Good	Field and Desktop



Survey Report 104037

Title Report on an Archaeological Survey at Swan Location K, Beechboro. Dec.1994.
Authors Harris, J.
Lead Consultant Jacqueline Harris
Survey Types Archaeological

Related Survey Areas for Survey Report 104037

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Archaeological	Swan Location K. Beechboro. The proposed housing development is located in the south western corner of the junction of Beechboro Road North and Marshall Road. The area comprises approximately 29ha as shown in Fig. 1	Very Good	Field and Desktop

Survey Report 104078

Title Report of an Aboriginal Heritage Survey Proposed Passing Lanes Great Northern Highway, Bullsbrook. July 1996.
Authors Prince, C
Lead Consultant McDonald, Hales and Associates Pty Ltd
Survey Types Archaeological and Ethnographic

Related Survey Areas for Survey Report 104078

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Archaeological and Ethnographic	Proposed passing lanes Great Northern Highway, Bullsbrook. Reserves on either side of the highway and small areas of recently acquired private land for the development of four passing lanes as shown in Locality Plan. 1	Good	Field and Desktop



Survey Report 104087

Title An archaeological survey of the Dampier to Perth natural gas pipeline route : section 6 Muchea to Wagerup.

Authors Pickering, M.

Lead Consultant Department of Aboriginal Sites, Western Australian Museum

Survey Types Archaeological

Related Survey Areas for Survey Report 104087

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Archaeological	Dampier to Perth Naturla Gas Pipeline Route, Muchea to Wagerup. This section runs from the 1314km point, 6 km south west of Muchea, to the 1478km point at Wagerup, a total distance of 164km as shown in Fig. 1.	Unreliable	Field and Desktop



Survey Report 104230

Title Report of a survey for Aboriginal sites at the proposed Pinjar Gas Turbine and Services Project, near Wanneroo.

Authors O'Connor, Rory.

Lead Consultant Gary Quartermaine

Survey Types Ethnographic

Related Survey Areas for Survey Report 104230

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Ethnographic	Proposed Pinjar Gas Turbine and Services Project, near Wanneroo. The project area includes the following: a) a 132kV overhead powerline on a 500m corridor from the Metropolitan Northern Terminal to the proposed gas turbine site, b) a gas turbine and ancillary facilities to be located on a 30ha block near the corner of Cypress and Perry Roads, Gnangara, c) a 20m wide gas pipeline easement from the Dampier - Perth main pipeline to the turbine site as shown in Figures 1-4.	Good	Field and Desktop
2	Archaeological	Proposed Pinjar Gas Turbine and Services Project, near Wanneroo. The project area includes a gas turbine and ancillary facilities to be located on a 30ha block near the corner of Cypress and Perry Roads, Gnangara, as shown in Fig. 1	Good	Field and Desktop



Survey Report 104250

Title Report of a survey for Aboriginal sites at the proposed TIO2 Dry Plant site, Muchea
Authors O'Connor, R.
Lead Consultant Gary Quartermaine
Survey Types Archaeological

Related Survey Areas for Survey Report 104250

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Archaeological	The survey area comprises of the proposed mineral sands plant which is located less than 1km north of Muchea, immediately east of the railway line and west of Ellen Brook(see figures 1 & 2).	Very Good	Field and Desktop

Survey Report 104252

Title Comments on Aboriginal sites in vicinity of proposed Homeswest development at Bennett Brook 1988 [OWE]
Authors O'Connor, R
Lead Consultant R. O'Connor and Associates Pty Ltd
Survey Types Ethnographic

Related Survey Areas for Survey Report 104252

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Ethnographic	Proposed Homeswest development at Bennet Brook.	Indeterminate	Field and Desktop



Survey Report 104253

Title Report on the Survey for Aboriginal Sites in the Vicinty of the Proposed Northern Perimeter Highway Route, Perth Metropolitan Area. Oct. 1987.

Authors O'Connor, R. & Quartermaine, G.

Lead Consultant Gary Quartermaine

Survey Types Ethnographic

Related Survey Areas for Survey Report 104253

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Ethnographic	Proposed Northern Perimeter Highway Route. The proposed Highway alignment between Mitchell Freeway and Beechboro Road. The inspections included a 50m buffer zone either side of the proposed road reserve.	Unreliable	Field and Desktop
2	Archaeological	Proposed Northern Perimeter Highway Route. The route runs east-west from 450m east of the Swan River across the Coastal Plain, crossing Bennett Brook, until it intersects with the Mitchell Freeway approximately 4.5km from the coast. The Northern Perimeter Highway runs from Great Northern Highway to Mitchell Freeway, a length of approximately 25km. The route runs along Middle Swan road in the east, then Victoria Road, just north of Widgee Road, immediately south of Curlington and Wilmington ...	Unreliable	Field and Desktop



Survey Report 104263

Title Report of the survey for Aboriginal heritage significance of the proposed Balga to Wundowie 132kv po
Authors O'Connor, R
Lead Consultant Gary Quartermaine
Survey Types Archaeological and Ethnographic

Related Survey Areas for Survey Report 104263

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Archaeological and Ethnographic	Proposed Balga to Wundowie 132kV Powerline Route. The proposed route runs east, from the Balga Northern Terminal Substation, along Marshall Road until it crosses the Swan River. It continues along the existing 330kV line then turns North along Swan Road just east of the Great Northern Highway. It follows Dalgety Road East then turns North into Campersic Road. Just south of Lennard Street, it heads east-north-east until it meets the 132kV line which it follows east until Bunning Road where ...	Unreliable	Field and Desktop



Survey Report 104379

Title Australian Research Grants Scheme: Final Report on the Project the Swan Coastal Plain, Western Australia.

Authors Hallam, S.

Lead Consultant S. J. Hallam

Survey Types Archaeological

Related Survey Areas for Survey Report 104379

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Archaeological	The survey area comprises 396 DIA sites/heritage locations listed in Appendix, and distributed throughout the Coastal Plain and Darling Ranges and Darling Plateau, from Lancelin south past Mandurah, as shown in Figure 1. The survey area location and extent are as per the AHMS.	temp	Field and Desktop



Survey Report 105471

Title Report on an archaeological investigation for Aboriginal sites proposed Whiteman Park access road

Authors Quartermaine, Gary.

Lead Consultant Quartermaine Consultants

Survey Types Archaeological

Related Survey Areas for Survey Report 105471

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Archaeological	Proposed Whiteman Park Access Road. From Beechboro Road to Whiteman Park Village. It involves an alignment of 3.3.5km with a corridor width of 50m. An alternative crossing, Option B, for the crossing of a Bennett Brook tributary is 700m in length as shown in Fig. 3	Very Good	Field and Desktop

Survey Report 200186

Title Report on the Aboriginal Heritage Monitoring Results of the Ellen Brook Wetland Treatment System on Lots 81 and 10865 In Belhus, Western Australia : December 2014. [TBD]

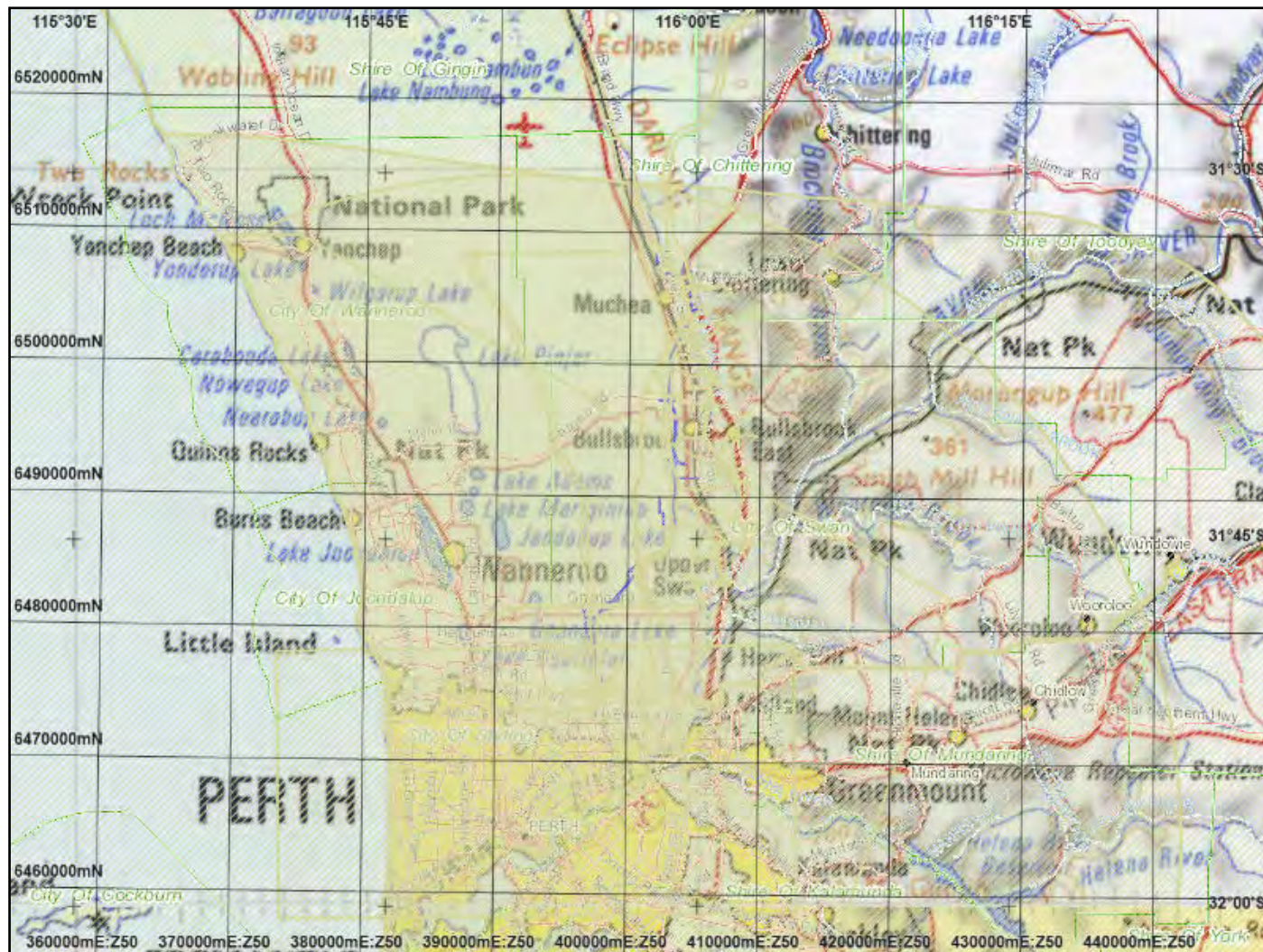
Authors de Gand, Daniel

Lead Consultant de Gand Pty Ltd

Survey Types Ethnographic


Related Survey Areas for Survey Report 200186

Area Number	Survey Type	Area Description	Spatial Accuracy	Field / Desktop
1	Ethnographic	Report on the Aboriginal Heritage Monitoring Results of the Ellen Brook Wetland Treatment System on Lots 81 and 10865 In Belhus, Western Australia : December 2014. [TBD]	Moderate	Field only



Legend

Selected Heritage Surveys

-  Heritage Survey
-  Aboriginal Community Occupied
-  Aboriginal Community Unoccupied
-  Town
-  Search Area

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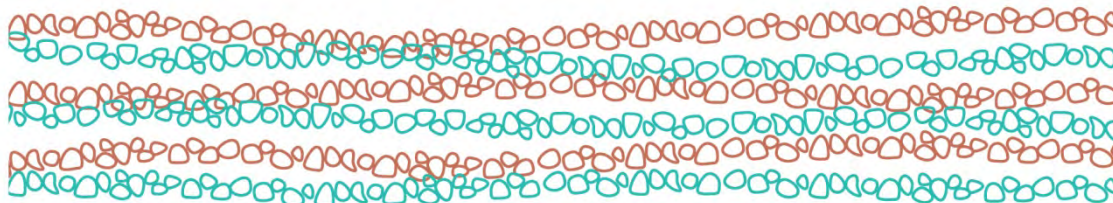
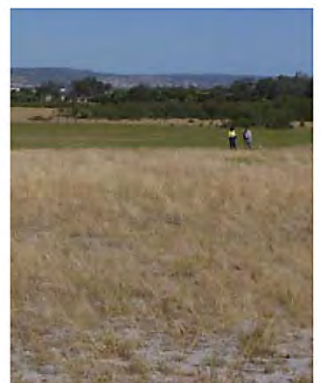
A Report on the Archaeological Assessment of the NorthLinkWA Project (Perth-Darwin National Highway).

Prepared for Main Roads Western Australia on behalf of
Amergin Consulting (Australia) Pty Ltd, Coffey Environments
Pty Ltd and BG&E Pty Ltd

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February 2015

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EXECUTIVE SUMMARY

Snappy Gum Heritage Services Pty Ltd (SGH) was engaged by Amergin Consulting (Australia) Pty Ltd (Amergin) on behalf of Coffey Environments Pty Ltd, BG&E Pty Ltd and Main Roads Western Australia (MRWA) to undertake an archaeological assessment of the NorthLinkWA corridor, which covers both the proposed Perth-Darwin National Highway (PDNH) and the proposed Tonkin Grade Separations.

This document outlines the results of the archaeological investigation which took place over two occasions: between 25 November and 29 November 2014; and 2 December to the 6 December 2014 (inclusive). The field survey was undertaken by Ryan Hovingh and Kellie Cue with members of the Noongar community as selected under the Whadjuk Protocol through discussions with the South West Land and Sea Council (SWALSC) and other relevant Aboriginal people.

The archaeological survey identified two previously unrecorded artefact scatters, NorthLink 14-01 and NorthLink 14-02, in areas consistent with previously noted archaeological patterns. More were expected and it is considered that low ground surface visibility obscured other Aboriginal archaeological sites.

The NorthLinkWA corridor was found to cover a range of land use practices associated with transportation, urbanisation through to pastoral practices, each of which has left a distinct imprint on and within the ground. These activities, coupled with the broad collection and removal of artefacts from 1970s research, have had a marked impact on the preservation of archaeological places in the Swan Coastal Plain. Of the 11 previously recorded artefact scatters shown on the Aboriginal Heritage Inquiry System overlapping the study area, only one (DAA Place ID 21994) was extant.

To minimise further impact to the archaeological record, this investigation has identified a series of recommendations including monitoring of the proposed development within relatively undisturbed areas with high potential for archaeological materials. This management process was supported by the Noongar representatives to also manage possible skeletal materials.

Other recommendations are made to protect the newly-recorded sites and manage the public, legal and archaeological concerns of the previously recorded heritage places.

Based on the findings of this survey:

- 1) It is **recommended** that MRWA ensures that all relevant staff/contractors are informed:
 - a) about the presence and location of Aboriginal archaeological sites NorthLink 14-01 and NorthLink 14-02 which are the product of practices connected to the traditional cultural life of Aboriginal people and may be considered Aboriginal sites under Section 5(a) of the *Aboriginal Heritage Act 1972*. These sites also represent past Aboriginal land use practices and are therefore of archaeological interest and may therefore also be classified as sites of importance and significance to the cultural heritage of the State that should be preserved under Section 5(c); and
 - b) that the artefacts within the sites have been made or modified by Aboriginal people as part of their cultural practices and may be considered Aboriginal objects under Section 6(1) of the *Aboriginal Heritage Act 1972*.
- 2) It is **recommended** that MRWA consult with the Department of Aboriginal Affairs about working within the existing DAA Place ID 21994 boundaries, which was verified in the field to lie outside the NorthLinkWA corridor;

- 3) It is **recommended** that MRWA continue to consult with SWALSC and other relevant Aboriginal people on the documentation and management of NorthLink 14-01 and NorthLink 14-02 even if the Aboriginal Cultural Material Committee (ACMC) does not consider them Aboriginal Sites under Section 5 of the *Aboriginal Heritage Act 1972*;
- 4) It is **recommended** that other stakeholders, such as the landowners, be informed about the site(s) on their property.
- 5) It is **recommended** that prior to nearby ground disturbance, sites NorthLink 14-01 and NorthLink 14-02 should be clearly delineated using physical markers and/or fencing and existing induction programmes/materials altered to alert staff in the area about the restrictions in entering or working near these heritage areas. Physical barriers may require periodic maintenance to ensure effectiveness.
- 6) It is **recommended** that MRWA should consult with SWALSC and other relevant Aboriginal people before commencing work within the boundaries of Stored (archaeological) places DAA Place ID 3178, DAA Place ID 3552, DAA Place ID 4039 and DAA Place ID 4099. There are no legal impediments for proposed work at these places;
- 7) It is **recommended** that should any ground disturbance be proposed for Registered (archaeological) Sites/Lodged Places DAA Place ID 3179, DAA Place ID 3180, DAA Place ID 3326, DAA Place ID 3618, DAA Place ID 3619, NorthLink 14-01 and NorthLink 14-02, that:
 - a) MRWA seeks formal, written advice from the DAA as to whether Ministerial consent is required under Section 18 of the AHA for the proposed works;
 - b) consultation with SWALSC and other relevant Aboriginal people takes place;
 - c) where necessary, an application is made under Section 18 of the *Aboriginal Heritage Act 1972* to use the ground on which the sites are located; and
 - d) where necessary, an application is made under Section 16 of the *Aboriginal Heritage Act 1972* to assess the subsurface potential of NorthLink 14-01.
- 8) It is **recommended** to the ACMC that the 44 isolated artefacts are not considered to be Aboriginal sites under Section 5 of the *Aboriginal Heritage Act 1972*;
- 9) It is **recommended** that monitoring by archaeologists and/or appropriately trained members of the Noongar community takes place in areas that have high potential for sites with some archaeological integrity; and
- 10) It is **recommended** to MRWA that the work may proceed as planned subject to the above recommendations and any additional recommendations made in the corresponding ethnographic report.

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DISCLAIMER

Snappy Gum Heritage Services Pty Ltd is not responsible and accepts no liability for omissions and inconsistencies that may result from information not available to the writers at the time of report preparation and/or publication.

SPATIAL ACCURACY

Data for this survey was recorded using a Garmin Hand Held GPS and configured using the GDA94 coordinate system. The coordinates listed in the report are recorded within MGA Zone 50 and are accurate to within ± 15 m (Garmin Limited 1996).

ACRONYMS & DEFINITIONS

The following acronyms are used throughout this report.

ACMC	Aboriginal Cultural Material Committee
AHA	<i>Aboriginal Heritage Act 1972</i>
AHIS	Aboriginal Heritage Inquiry System
ATSIHP	<i>Aboriginal & Torres Strait Islander Heritage Protection Act 1984</i>
DAA	Department of Aboriginal Affairs
EPBA	<i>Environmental Protection & Biodiversity Act 1999</i>
GIS	Geographic Information System
GPS	Global Positioning System
MRWA	Main Roads Western Australia
NTA	<i>Native Title Act 1993</i>
SGH	Snappy Gum Heritage Services Pty Ltd
SWALSC	South West Aboriginal Land and Sea Council

The following definitions are used throughout this report.

Aboriginal Site	A place to which the <i>Aboriginal Heritage Act (1972)</i> applies by operation of Section 5
Desktop Survey	An inspection of the DAA site register, reports and other relevant materials to determine the presence or absence of Aboriginal sites within a given area.
Archaeological place	In the context of this report, this phrase applies to areas with cultural materials remnant of past Aboriginal occupation. These places are considered to have some archaeological significance but have not yet been determined as Aboriginal sites under the <i>AHA</i> by the ACMC. Other types of significance may also apply.
Isolated artefact	Any artefacts that are not considered to fall within an archaeological site and are considered to have little or no archaeological significance.

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INTRODUCTION

NorthLinkWA is the combination of two projects funded by the Federal and State governments: a proposed highway link that will form part of the Perth-Darwin National Highway between Tonkin Highway and Muchea; and the grade separation of the intersections of Tonkin Highway with Collier Road, Morley Drive and Benara Road and other associated road upgrades.

Snappy Gum Heritage Services Pty Ltd (SGH) was engaged by Amergin Consulting (Australia) Pty Ltd (Amergin) on behalf of Coffey Environments Pty Ltd, BG&E Pty Ltd and Main Roads Western Australia (MRWA) to undertake an archaeological assessment of the proposed NorthLinkWA corridor.

The heritage brief, as outlined in the Scope of Works (Amergin 2014:1), is as follows:

- “Investigate and make recommendations for managing identified Aboriginal heritage issues that may be affected by the Project in accordance with the requirements of the *Aboriginal Heritage Act 1972 (WA)*, including preparing all submissions for obtaining appropriate approvals;
- Undertake all necessary heritage surveys and obtain all necessary clearances for construction (for refined ultimate planning design concept) to proceed in accordance with the Whadjuk Protocol; and
- Investigate and make recommendations for managing identified European heritage issues that may be affected by the Project in accordance with the requirements of the *Heritage of Western Australia Act 1990 (WA)* including preparing all submissions for obtaining appropriate approvals.”

This report addresses in part points one and two and supplements a comprehensive desktop review undertaken in late 2014 by Coldrick, Hovingh and McDonald (2014). The third, which addresses European issues, is being addressed by TPG: Town Planning, Urban Design and Heritage on behalf of Amergin.

This document outlines the results of the archaeological investigation which took place over two occasions: between 25 November and 29 November 2014; and 2 December to the 6 December 2014 (inclusive). The field survey was undertaken by Ryan Hovingh and Kellie Cue with members of the Noongar community as selected under the Whadjuk Protocol through discussions with the South West Land and Sea Council (SWALSC) and other relevant Aboriginal people.

This report outlines the legal and environmental contexts of the inspection; the individuals involved; the methods employed to examine the areas and the results of the investigation. Site significance is assessed within the context of these research questions and to guide recommendations, which are then presented based upon the survey findings. All newly-recorded sites are presented in a manner that facilitates inclusion in the Department of Aboriginal Affairs' Heritage Submission Form.

Acknowledgements & list of survey participants

SGH would like thank all representatives who participated in the field surveys.

Table 1: Survey Participants 25 November to 29 November 2014

SGH	Noongar Representatives
Ryan Hovingh	Ron Gidgup Senior
Kellie Cue	Cedric Jacobs
	Rodney Garlett
	Ben Ugle
	Ezra Jacobs-Smith
	Shannon Garlett
	Casey Phillips

Table 2: Survey Participants 2 December to 6 December 2014

SGH	Noongar Representatives
Ryan Hovingh	Vanessa Corunna
Kellie Cue	Vita Warrell
	Crispian Warrell
	Murray Riley
	Jamie Baker
	Leroy Corunna
	Arnold Pickett

PROJECT AREA

NorthLinkWA

As stated above, NorthLinkWA is the combination of two projects:

- **Perth-Darwin National Highway (PDNH)** - construction of a new 37km highway link between the junction of Reid Highway / Tonkin Highway and Great Northern Highway / Brand Highway at Muchea; and
- **Tonkin Grade Separations (TGS)** - grade separation of the intersections of Tonkin Highway with Collier Road, Morley Drive and Benara Road, and associated works.

Together these projects, measuring approximately 44 km in length and approximately 100 m wide for much of the corridor, are vital components of a wider series of improvements to the Perth–Darwin National Highway (see Figure 1). Various intersections with ancillary roads will be upgraded accordingly.

More information about the NorthLinkWA project can be obtained from www.NorthLinkwa.com.au.

The survey boundaries of the Perth-Darwin National Highway and the Tonkin Grade Separations used during the archaeological investigation are illustrated in Figure 1.

Local Environment & Urban Impact

The NorthLinkWA project covers a range of different environments, from built environments, to pastoral leases through to native bushland. The vegetation and faunal aspects of the area will be covered in an associated report by Coffey Environmental Pty Ltd.

Being mostly within the Perth metropolitan area, the local environment had been substantially modified by urban development. The range of activities includes, but is not limited to, road construction, sand quarrying, water and telephone services (see Photo 1), powerline corridors, firebreaks (see Photo 2), recreational parks and reserves (such as Whiteman Park), pine plantations and pastoral activities (see Photo 3).

The impact of these activities on the ground surface is highly variable. Figure 4 and Figure 5 illustrate the supposed extent of this impact, although these attributes determined in the field are considered indicative only.

Similarly, the variation in land use patterns and vegetation coverage variably limited the extent of ground surface visibility. Figure 2 and Figure 3 show the variation in ground surface visibility across the survey area.

Both the extent of ground surface visibility and the impact of various activities have implications with respect to survey methods, survey results and further management. These will be discussed later in the report.



Photo 1: Telstra services: one of many services that have had an impact on the subsurface potential for artefacts.



Photo 2: One of the few places with high ground surface visibility – north of Maralla Road, Ellenbrook.



Photo 3: Pastoralism has a great impact on ground surface visibility. Between Neaves Road and South Muchea Road.

Figure 1: Overview of the NorthLinkWA project area (Source: Coffey)



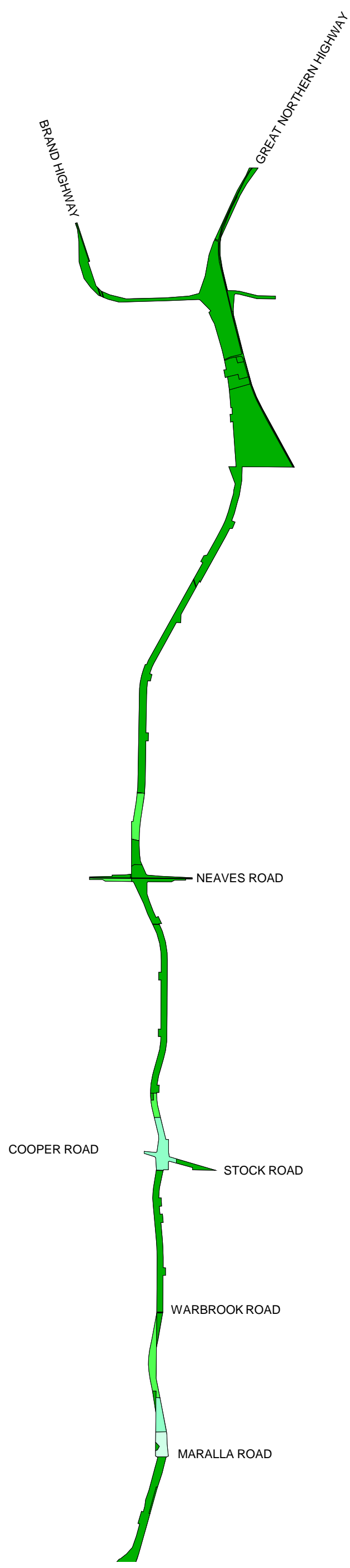
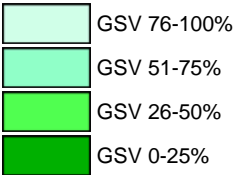
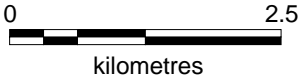


FIGURE 2:
Variability in the
ground surface
visibility across
the survey area –
North End



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 Date: 5 February 2015
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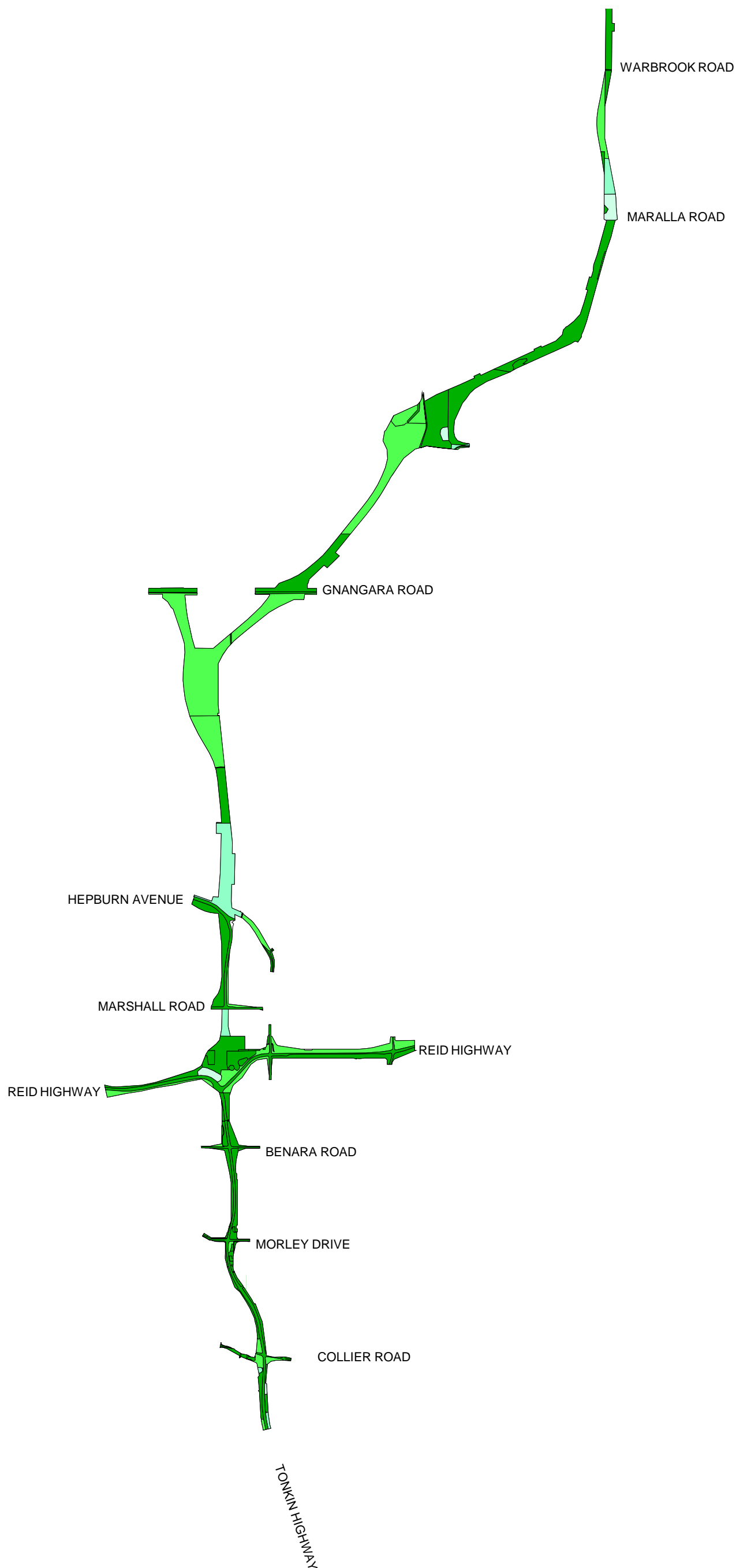
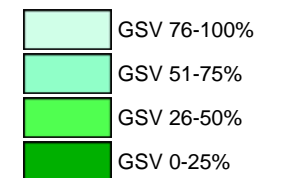


FIGURE 3:
Variability in the
ground surface
visibility across
the survey area –
South End



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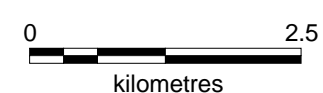




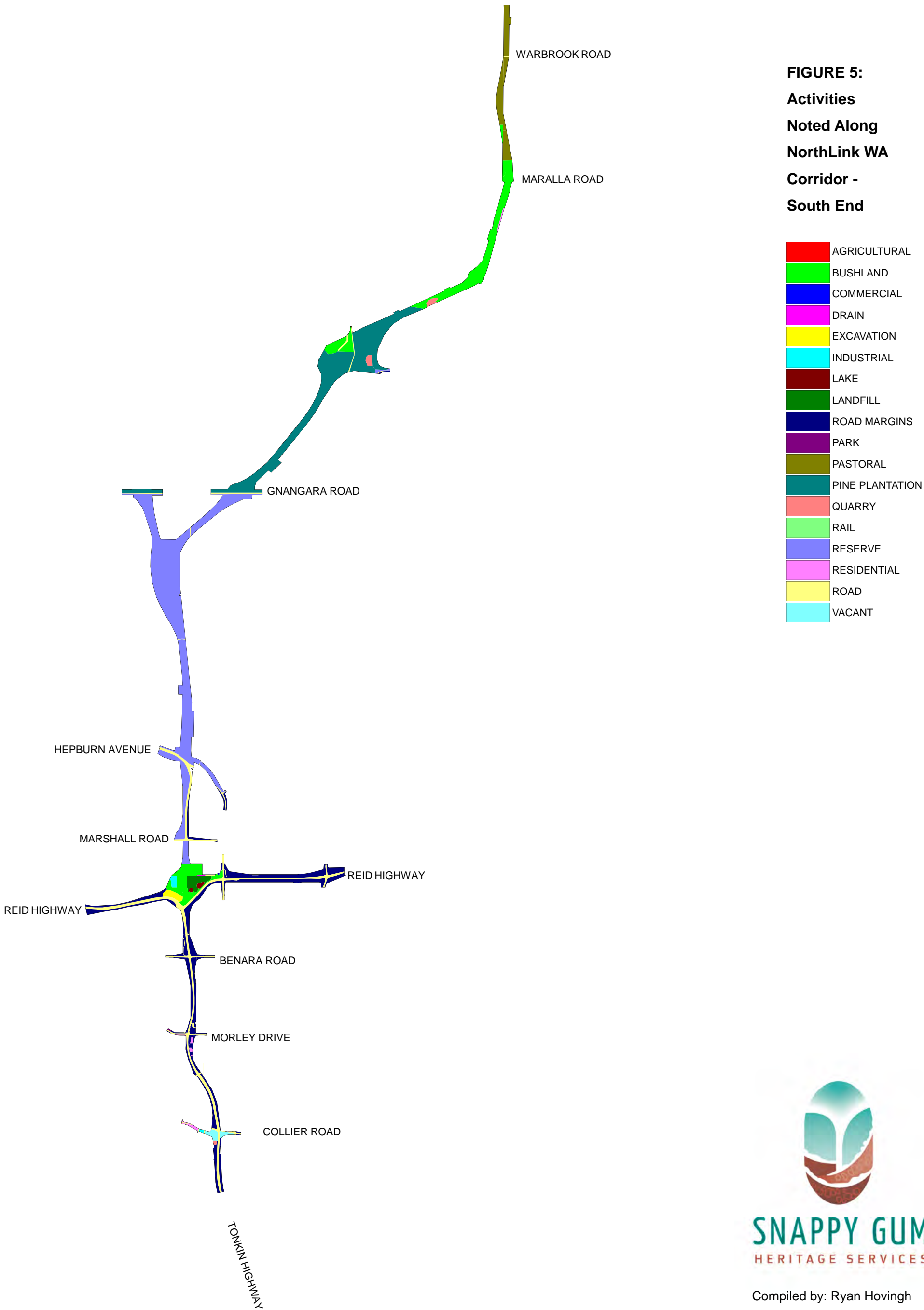
FIGURE 4:
Activities
Noted Along
NorthLink WA
Corridor -
North End

■	AGRICULTURAL
■	BUSHLAND
■	COMMERCIAL
■	DRAIN
■	EXCAVATION
■	INDUSTRIAL
■	LAKE
■	LANDFILL
■	ROAD MARGINS
■	PARK
■	PASTORAL
■	PINE PLANTATION
■	QUARRY
■	RAIL
■	RESERVE
■	RESIDENTIAL
■	ROAD
■	VACANT



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FIGURE 5:
Activities
Noted Along
NorthLink WA
Corridor -
South End



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CONTEXTUAL INFORMATION

Legal and Ethical Context

Aboriginal archaeological surveys take place within a legal and ethical framework that underpins survey methods, survey findings, cultural heritage recommendations and the approvals process.

There are a number of Commonwealth and State Acts that provide for the recognition, protection and management of Aboriginal rights and interests in relation to land and heritage. In Western Australia, the *Aboriginal Heritage Act 1972 (WA)* ("AHA") provides the principal legislative framework for the protection and preservation of places and objects that are of significance to Aboriginal people and their cultural heritage. The AHA is administered by the Minister for Aboriginal Affairs, who must consider the recommendations of the Registrar for Aboriginal Sites and the Aboriginal Cultural Material Committee ("ACMC") although the Minister is not bound by such recommendations. The AHA applies to any place or object of significance to Aboriginal people as defined in Sections 5 ("Aboriginal site") and 6 ("Aboriginal objects") of the AHA.

It is an offence under the AHA for a person (or company otherwise known as a proponent) to excavate, destroy, damage, conceal or in any way alter any Aboriginal site, or to remove any object from an Aboriginal site, without prior authorisation from the Registrar of Aboriginal Sites under section 16 or the consent of the Minister for Aboriginal Affairs under section 18 of the AHA. The AHA therefore imposes an obligation on all land users who wish to use land for a purpose which might contravene the AHA to exercise due diligence in evaluating whether or not their proposed activity on a specified area may damage or destroy an Aboriginal site. Pursuant to Section 17, an offence is committed if these provisions are contravened and penalties may be imposed as a consequence.

Whether an Aboriginal site exists and is significant to Aboriginal people is determined by the ACMC, taking into account numerous factors including any anthropological, archaeological and/or cultural/ethnographic interests in the land concerned. Once a determination is reached, the ACMC makes a recommendation to the Minister to either grant or refuse an application to use the land, as well as any conditions that may be attached to the consent.

It is important to note within the context of this report that the manner in which the information is presented to the ACMC, the decisions about what constitutes an Aboriginal Site and the way they are managed has varied since the inception of the AHA. Without going into too much detail, a quick summary is as follows:

- i) In the early 1970s, the known archaeological record was limited. Even individual artefacts, recorded with minimal mapping technologies, were recognised as Aboriginal Sites and protected accordingly;
- ii) Since the mid-1990s, the intensity of archaeological investigations increased. More sites were identified but the use of GPS technology was still in its infancy. Large buffers were placed around sites to minimise potential impact;
- iii) The archaeological industry became increasingly standardised by approximately the year 2000 and the reporting of potential sites was designed to inform the ACMC to allow them to make a decision about the sites' importance under Section 5 of the AHA; and
- iv) By 2012, changes in the way the Department of Aboriginal Affairs' (DAA) managed site classification and approvals for the mining industry placed the onus of establishing site importance back onto the consultants with the final decision resting with the ACMC. As part of this process, the DAA released the Section 5 'threshold criteria', which was designed to assist with their interpretation of the Act.

- v) In November 2014, the DAA submitted The Aboriginal Heritage Amendment Bill 2014, which suggests changes to the AHA, such as increasing the penalties for site disturbance, streamlining the approvals process through the issue of permits and declarations but indirectly raises the standard about sites are considered 'important'. The ACMC will take on advisory role to the CEO who will have final veto on what constitutes an Aboriginal Site. As a result, the decision process is currently under review and is subject to change.

SGH identifies and reports on archaeological sites which may contribute to current or future archaeological research. However, the final decision about whether an individual site constitutes an Aboriginal site under the AHA lies currently with the ACMC and consents to use land rests with the Minister for Aboriginal Affairs. As a consequence, SGH makes a distinction between 'archaeological places' and 'Aboriginal sites' throughout this report.

The proponent should also be aware of the application of the *Native Title Act 1993* (Cth) ("**NTA**"), which establishes a process in which native title rights and interests are recognised, as well as how various acts affecting such native title rights and interests are to be dealt with. These native title rights and interests may include the right of exclusive possession and use for traditional purposes by the holders of native title such as camping, fishing, hunting, taking traditional resources, carrying out cultural and religious activities and teaching of law and custom on land where native title has been determined to exist by the Federal Court of Australia. Where an act proposed to be carried out on land or waters is likely to affect native title, the NTA sets out procedures which must be followed in order for the act to be valid ("**future act provision**"). Examples of future acts include the grant of mining leases, exploration licences and some compulsory acquisitions by the government. As native title considerations vary between Aboriginal groups, the proponent should seek independent advice on this issue.

Certain future acts give rise to a right to negotiate under the NTA whereby the government, the developer and the native title party must negotiate "in good faith" about the effects of the proposed activities on the native title party's rights and interests.

Archaeological places may also fall within the jurisdiction of the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (Cth) ("**ATSIHP Act**"). While the ATSIHP generally defers to the correct application of the state legislation, the ATSIHP Act enables an Aboriginal person or group to apply to the Minister for a declaration to preserve and protect, by way of interim or permanent declaration, from injury or desecration areas or objects of particular significance to Aboriginals in accordance with Aboriginal traditions. A person who engages in conduct in contravention of a provision of such declaration commits an offence under the ATSIHP Act.

Similarly, 'outstanding' sites of nationwide heritage significance can also be protected under the *Environmental Protection and Biodiversity Act 1999* (Cth) ("**EPBA**") but few archaeological places to date are recognised under this Act. Places where heritage values are linked directly to the physical and biological attributes of the environment may also be assessed in accordance with the *Environmental Protection Act 1986* (Environmental Protection Authority 2004).

There are also legislative provisions which apply to specific types of sites. For example, if human remains are uncovered by any development, the *Coroners Act (1996)* (WA), the AHA and the ATSIHP Act would be applicable. If any human remains are uncovered during development, the police and the Department of Aboriginal Affairs must be notified immediately.

SGH is also guided by ethical responsibilities that support Aboriginal input, and recognise that the archaeological record is a non-renewable resource. As such, SGH advocates the conservation, curation and preservation of archaeological sites, assemblages, collections and archival records where possible. For more information, please refer to the Australian Association of Consulting Archaeologists' website (2011) www.acaai.com.au.

Disclaimer

The above material is a summary produced by the writer based on the writer's own opinion, knowledge and experience. It is not intended to be used as legal reference or constitute any type of legal advice in respect to the subject matter. Persons wishing to rely on the above material should seek independent legal advice.

Archaeological Background

The local archaeological context of the NorthLinkWA project has been discussed at length in the desktop assessment by Coldrick, Hovingh and McDonald (2014:11). As part of the archaeological investigation, all sites will need to be assessed according to their scientific significance, which is generally related to their ability to address current research questions and how well they are represented in the known archaeological record. This will be discussed further in the Site Significance Assessment Methods of this report.

Archaeological research in the South-West region of Western Australia generally follows a number of key themes:

- The timing and nature of human occupation regionally and Australia wide;
- The life ways of Aboriginal people in the past;
- The nature and negotiation of broad scale and local group social interactions; and
- The impact of European colonisation on Aboriginal life patterns.

Timing and nature of human occupation

Early Australian archaeological research was primarily concerned with determining the earliest dates for the colonisation (of Australia) by Aboriginal people over time. Archaeological evidence from sites across Australia provide unambiguous evidence that humans were occupying most, if not all, of the continent by 60,000 BP: see for example Carpenter's Gap (O'Connor 1995), Cuddie Springs (Field, Fullagar et al. 2001), Devil's Lair (Turney, Bird et al. 2001), Nauwalabila (Roberts, Jones et al. 1994b), Puritjarra (Smith, Bird et al. 2001) and Riwi (Balme 2000). Note that 'BP' refers to 'Before Present', where present is internationally considered to be 1950.

Devil's Lair is of particular national and international significance as it is located within the broader South-West region of Western Australia and has provided a significant archaeological and palaeontological record for this area (Dortch 1979). It has the oldest recorded date for Pleistocene human occupation in the region with an age estimate of 45,500 ¹⁴C yrs. BP (Turney, Bird et al. 2001).

Other sites within the Perth metropolitan region (Swan Coastal Plain) also record Late Pleistocene occupation (the Pleistocene Period ranging between 2.588 million years BP to 11,700 years BP). Upper Swan, which is between 5 and 7 km from the NorthLinkWA Project, was determined to be approximately 38,000 BP (Pearce and Barbetti 1981). Further afield, Helena River was assessed as being 29,000 BP (Bowdler, Strawbridge et al. 1991). In the Holocene, which dates from the end of the Pleistocene to the present, the results are less clear.

Dating Holocene occupation within the Swan Coastal Plain, however, is problematic due to the dearth of stratified archaeological sites in the region. Where sites have been subjected to archaeological excavation, only one has been dated (at North Lake) to 2,200 years ago (Pearce 1979 cited in Bowdler, Strawbridge and Schwede 1991: 25). Most are reported to have little stratigraphic integrity, being disturbed by natural processes (constant dune deflation) as well as farming, urban development and low levels of deposit accumulation (Bowdler, Strawbridge et al. 1991). Older Holocene sites tend to be found within the mid-southern jarrah forests such as Collie (5810 ± 330 BP), Boddington (3230 ± 170 BP) and North Dandalup (1280 ± 80 BP) (Pearce 1982; Anderson 1984). Sites in the Leeuwin Naturaliste Ridge (in a mosaic of Karri and

Jarrah forests) similarly record Holocene occupation from approximately 8000 years ago to within the last few hundred years (Dortch 2004).

Relevant archaeological research questions that apply to the timing and nature of human occupation are as follows:

- What is the antiquity of human occupation across the Swan Coastal Plain? And how does this contribute to our understanding of the timing, nature and rate of occupation over time in this region?
- What was the pattern and intensity of occupation of the Swan Coastal Plain and what does this suggest about sites in the different geomorphic zones?
- What does the age of the wetland areas imply about the age of associated sites? If those wetlands areas were not present when the sea level was lower, what was the pattern and intensity of occupation of the Swan Coastal Plain and what does this suggest about sites in the different geomorphic zones?
- Why do many sites lack evidence of sediment accumulation? What taphonomic conditions may be contributing to this and how does this influence site formation?

Life-style patterns and behaviour

How Aboriginal people were subsisting during the Pleistocene is drawn from sites within the Leeuwin-Naturaliste Region further to the south of the Swan Coastal Plain as to date, no significant zoo-archaeological data has been found from Pleistocene sites within the Swan Coastal Plain (Dortch, Balme et al. 2011).

Zoo-archaeological evidence from four key sites in the Leeuwin-Naturaliste Region (Devil's Lair, Tunnel Cave, Rainbow Cave and Witchcliffe Rockshelter) suggests that people using these sites relied on a diet of largely terrestrial mammal vertebrates including kangaroo, bandicoots, possums as well as small amounts of fish, lizards, birds and emu eggs (Balme, Merrilees et al. 1978; Dortch 1979; Dortch 2004; Dortch, Balme et al. 2011).

Evidence for subsistence patterns within the Holocene for the Swan Coastal Plain (and the NorthLinkWA Project) comes largely from ethno-historical literature (Meagher 1974) and records a mobile foraging economy based on the seasonal exploitation of terrestrial and aquatic resources with the latter obtained largely from wetland and riverine/ estuarine environments (Dortch 2002).

Dortch (2002) frames this past mobile foraging economy within two classes of sites (congregative and dispersive) which reflect the "periodic congregation and dispersal of families, local descent groups and bands" (Dortch 2002:13). These contrasting settlement/mobility systems create contrasting archaeological signatures (Dortch 2002: 14 see Dortch's Table 3 for a detailed list of site type examples) that, at the regional scale, provide evidence for group mobility, dispersal, and congregation through reciprocal agreements on land access and usage.

Within this framework large, open dispersive sites are largely recorded archaeologically as isolated finds or as small sparse stone artefact scatters. Indicators of large, open congregative sites, are extensive stone artefact scatters or the seasonal use of areas such as the Barragup Weir or sites along the Swan River in modern day Perth which have been recorded in the ethno-historical literature (Dortch 2002).

Within the Swan Coastal Plain, most recorded sites occur within the 'Bassendean Dune System' which lies midway between the eastern alluvial plains and foothills of the Darling Scarp and the western (and younger) Spearwood and Quindalup Dune Systems (Hallam 1987; Bowdler, Strawbridge et al. 1991). It is thought that the relatively high number of sites recorded in this area in comparison to other parts of the Swan Coastal Plain is most likely due to the presence of swamps and lakes that would have provided relatively stable and

seasonally predictive food resources (Meagher 1974; Anderson 1984; Hallam 1987; Bowdler, Strawbridge et al. 1991). Archaeological investigations using site frequency as a measure of site use suggest that the seaward margin (Quindalup Dune System) was not used significantly in terms of camping and resource procurement (Hallam 1987: 14).

Ethno-historical accounts record that summer was the season for the largest aggregation of people when fish and other aquatic fauna in particular were hunted along the sea coast and in estuaries. Late summer was also when large areas were burnt to facilitate the capture of larger species such as kangaroos and wallabies as well as to promote favourable habitats for preferred animals (Meagher 1974; Hallam 1989). Recent research proposes that the vegetation communities of the South West Botanical Region represent the effects of this frequent, low intensity, controlled firing regimes used by Noongar people in the past as a form of land management or environmental niche construction (Hallam 1989; Kost 2013).

Local Aboriginal people in the South-West were relatively unaffected by changes in aridity associated with the Last Glacial Maximum and sites continued to be used, if somewhat sporadically, across the broad quaternary span (Dortch and Smith 2001; Dortch, Balme et al. 2011). There is, however, much discussion regarding local changes in population distribution regarding environmental fluctuations in forested vs open woodland regimes (cf. (Balme, Merrilees et al. 1978; Ferguson 1985; O'Connor, Veth et al. 1993; Burke 2004).

It is still not clear from archaeological evidence how people used and moved through the various environmental zones (coastal plain, plateau and forests) that make up the South-West region largely due to preservation and visibility issues as many sites have been disturbed by European colonisation or are not visible in areas of high density vegetation. Anderson (1984) postulates that the coastal plains and plateau areas of the Swan Coastal Plain were more actively utilised based on the seasonal availability of resources and related social and land use obligations although this model does not take into account later palaeo-environmental and archaeological evidence that suggests that forested areas were also well utilised as part of a broader system of land use and management (Dortch 2004; Kost 2013).

In the wider South-West, the stone tool record exhibits an unusual pattern involving the decline and disappearance of artefacts made from a distinctive type of fossiliferous chert, between 12,000 and 4,500 years BP (Ferguson 1980). The sources of the fossiliferous chert are postulated to have been submerged by rising sea levels, which attained their present position around 6,500 years BP and so acts as a temporal marker in archaeological contexts (Glover and Lee 1983).

Preliminary research suggests that chert use became more economic over time and that other local raw material sources (such as crystal quartz) became increasingly utilised as access to fossiliferous chert sources declined (Schwede 1990; Worrell 2008). The knapping properties of available lithic materials, site type and the local geological context of a site appear to have influenced responses to this changing raw material availability over time (Dortch 2002; Worrell 2008).

Analysis of artefactual material in the Swan Coastal Plain historically focussed on describing phases of stone tool technology over time (Schwede 1990) but to date little detailed stone artefact analysis has since been carried out at more extensive scatter sites which may provide insights into the choices and agency at work within a stone artefact assemblage and is an area for future research.

Relevant archaeological research questions that apply to Aboriginal life-style patterns and behaviour include:

- Why is the recorded number of sites within the Bassendean Sands formation higher compared to other zones? And what does this indicate about demographic changes, mobility and land use patterns over time?
- What technological changes over time are discernible in stone artefact assemblages as a result of the loss of fossiliferous chert sources?

Broad scale and local group social interactions

Evidence for trade and exchange is marked by the transportation of various stone types across the region from as yet unknown quarry sources. In particular, there is evidence of fossiliferous chert artefacts well inland from now submerged quarry sources which suggests that this material was traded or transported (Dortch 2002).

Ethno-historical sources describe the seasonal movements of large groups particularly in summer linked to the exchange of male initiates, shared ceremonies and exogamous marriage arrangements as well as the consolidation of kinship and broader group alliances (Hallam 1989; Dortch 2002). Longer distance trade networks are also described with groups exchanging items such as ochre or specialised items such as spears from near modern day Albany through to the Murchison area (Le Souef 1993).

Items that leave little or no archaeological trace such as kangaroo skins and wooden implements were also regularly reported to have been traded and exchanged (Tilbrook 1983; South West Aboriginal Land and Sea Council 2010).

An archaeological research question that applies to broad scale and local group social interactions is:

- What is the spatial distribution and nature of fossiliferous chert artefacts within the broader South-West region and what does this suggest about past trade and exchange networks?

Post European settlement Aboriginal life-ways

European settlement in the southern part of Western Australia disrupted traditional Aboriginal social organisation, traditional home lands, lifestyle and culture by introducing and enforcing a foreign social organisation. However, ethno-historical records and oral histories from Aboriginal people indicate that many cultural traditions were maintained well into the very recent past including corroborees and traditional hunting practices as well as the regular firing of the landscape to rejuvenate vegetation (Tilbrook 1983; South West Aboriginal Land and Sea Council 2010; Kost 2013).

Archaeological evidence signalling the use of country by Aboriginal people in historic times is manifested in the inclusion of historical artefacts in stone artefact scatters such as flaked glass, clay pipes or matchbox and tobacco tins. Other connections include the continuing use of bush resources such as medicinal plants and the transmission of cultural knowledge.

Aboriginal participation in the agricultural industry during the past century is also of significance to many Aboriginal groups in the region as many people found work on farms in the South-West. Other historical sites such as farm camps, burials, fringe camps, missions and other institutions now since closed also have contemporary importance to local Aboriginal communities. Similarly, pre-European Aboriginal sites demonstrate group ownership of country and are a tangible link to the past as a source of heritage and identity (Tilbrook 1983; South West Aboriginal Land and Sea Council 2010).

An archaeological research question that discusses Post European settlement Aboriginal life-ways is:

- What archaeological evidence is there for the maintenance and adaptation of Aboriginal life ways following European colonisation?

ASSESSMENT METHOD

The Survey Process

The archaeological assessment of the NorthLinkWA project was undertaken using a four-step process.

- i) Undertake a desktop review and use the AHIS data from the DAA to determine the approximate location of the relevant archaeological places. AHIS information and previous heritage reports were accessed to obtain site-specific information;
- ii) Ground-truth previously recorded archaeological heritage places and relocate the boundaries of the archaeological material;
- iii) Undertake a survey over the NorthLinkWA Project survey area to identify and document any unrecorded archaeological places; and
- iv) Assess the archaeological significance of each archaeological heritage place where possible.

Each of these processes is documented below.

Desktop Research Methods

Coldrick, Hovingh and McDonald (2014) completed a desktop review of previously recorded Aboriginal heritage places within the NorthLinkWA corridor. Their assessment involved a search of the Department of Aboriginal Affairs' (DAA) online Aboriginal Heritage Inquiry System (AHIS) and the downloaded dataset. As many of the places encompassed large areas, further consultations were undertaken with DAA representatives to eliminate those that did not intersect with the proposed development corridor.

Relevant site files and heritage reports were reviewed where available, with consent being obtained for those areas with restricted site access (2014:8).

Ground-truth previously recorded heritage places

The survey team visited all archaeological sites identified in the Coldrick, Hovingh and McDonald (2014) desktop review. At each location, the documented details of each site were relayed to the available Noongar representatives and then re-inspected on foot.

The current archaeological materials were assessed against the previously recorded information and records were updated as necessary.

Field Survey Method

The NorthLinkWA corridor was inspected to identify any areas that may have archaeological significance to allow MRWA to manage these during project development. The process for identifying Aboriginal cultural materials generally followed three steps:

1. The entire NorthLinkWA corridor was inspected by the survey team after the landholders had been contacted by either office-based staff within the NorthLink Project team or the SGH field survey team. Surveys are undertaken on foot, with team members spaced at approximately 15 – 40 m intervals and walking the length of the survey area. As discussed in the Local Environment section of this report, the lack of ground surface visibility was a consideration: in low visibility areas, team members spread out to look for small clearings to examine for archaeological materials.

In addition to ground surface visibility, factors such as team members' fitness, surveying experience and the terrain in which the survey is conducted may limit or bias the survey results. This being the case, SGH recognises that the survey is a sampling exercise designed to identify as many

Archaeological places as possible but acknowledges that the outcomes of any archaeological surface survey may in general terms only be representative of the visible rather than the actual archaeological record. To minimise any limitation or bias, several strategies were employed:

- a. Inexperienced team members were introduced to diagnostic characteristics on numerous stone artefacts (see Holdaway and Stern 2011) and survey methods explained. They also surveyed under the direct supervision of the team archaeologists or other experienced survey team members until their stone artefact identification skills improved;
 - b. The combined use of systematic and purposive sampling strategies (where applicable) ensured that the greatest area possible was surveyed;
 - c. Team members were encouraged to walk at a pace commensurate with their experience to allow for the identification of artefacts, while being mindful of survey timeframes;
 - d. Where vegetation was dense, all survey participants were encouraged to walk at a slower pace and opportunistically inspect areas of less density.
 - e. Regular breaks were encouraged to maximise survey viability.
 - f. Surveys were undertaken when lighting conditions were adequate to identify artefactual materials.
2. The presence/absence of newly identified archaeological places was determined. Once an artefact and/or cultural feature was identified, it was recorded using the process below and an assessment was made where warranted as to its suitability for being an archaeological place.
 3. The proposed management options for both previously recorded and newly recorded places were discussed onsite with the Noongar representatives.

Recording Method

Once archaeological material had been identified, it was assessed as being either a potential Aboriginal Site, as discussed in Coldrick, Hovingh and McDonald (2014:6), or an *isolated find*.

Isolated finds have been designated as such by the survey team as they are considered by the survey team to have next to no significance to either the archaeological community or the Aboriginal community. As such, these artefacts are not considered to be important or significant under Section 5 of the AHA and do not often require protection from a proposed development.

The following features are, however, recorded for Isolated Finds:

- a) Location – GPS coordinates using a handheld Garmin GPS
- b) Flaked stone artefacts – the type, lithology, retouch length and location, percentage of heat fracture and any other relevant comments.

If the area is identified as an archaeological place it is recorded in line with the overall survey strategy. These steps are as follows:

- a) Determine site extent in consultation with Noongar representatives and mark boundaries in line with the proponent's heritage practices. Boundary point locations are obtained using a handheld Garmin GPS, which is accurate to within ± 15 m (Garmin Limited 1996). Given the proximity of the public and/or livestock to these sites, their boundaries were not demarcated in any physical way to protect the sites and/or the livestock.

- b) Record basic site information through the use of hand-drawn plans detailing environmental and archaeological features, photographs and written notes to confirm the decision-making process about the Aboriginal archaeological place's status.
- c) Detailed artefact dimensions are sampled in areas that may be subject to disturbance. In these instances, it is expected that the proponent will be using the approvals process to obtain permission to use the land. These sampled metrics are then used to identify and demonstrate the archaeological significance of the place.

Site Significance Assessment

A significance assessment is a process used to assess the 'importance' or 'significance' of a place or object and is considered to be an important consideration in heritage management where the values attributed to a place or object can be managed and/or protected (Schiffer and Gumerman 1977; Pearson and Sullivan 1995; Smith 2004).

On an international scale, significance assessments are currently drawn from the Burra Charter model (Australia ICOMOS Burra Charter 1999), which focuses on five types of significance: aesthetic, historical, scientific and social [spiritual significance has since been added in a 2013 revision of the Burra Charter (Australia ICOMOS Burra Charter 1999)]. This report is primarily concerned with archaeological (scientific) significance which is generally determined by the site's potential to address research questions and representativeness (Bowdler 1981:19). By demonstrating scientific significance, an Aboriginal archaeological place may be demonstrated as being important with respect to the traditional cultural life of Aboriginal people (under Section 5(a) of the AHA) or to the archaeological community under Section 5(c).

The degrees of significance can be moderated by five key comparative criteria: provenance, representativeness, rarity, integrity and interpretative capacity (Russell, Winkworth et al. 2009). Of these, representativeness, rarity and integrity are used most commonly in Aboriginal heritage surveys. Provenance and interpretative capacity are more applicable to objects in collections but can be useful considerations.

In WA, the DAA have introduced criteria to 'test' whether archaeological materials may be considered Aboriginal Sites. To meet the Section 5 eligibility, DAA stress the importance of site integrity, rarity and association of the materials to the 'place' and be of benefit to the wider WA community.

Determining Archaeological Research Potential

In the Archaeological Background section of this report, we identified numerous research questions and themes that are currently being applied to archaeological sites on a regional and local level. The list of research questions applicable to the NorthLinkWA Project is listed in Table 3. These questions are by no means exhaustive and the research questions need to be considered in relation to the site, its context and the relevancy of the research question to today (refer to Bowdler 1981).

Clearly, the integrity of a site is an important consideration when determining the place's suitability for archaeological research, as emphasised in the DAA criteria and Russell, Winkworth et al (2009).

While applicability to research questions is a useful concept to gauge the current significance of a site, its use has been criticised as not being able to anticipate future research (Raab and Klinger 1977; Dunnell 1979; Smith 2004). Representativeness (the extent to which similar sites are represented elsewhere) was established to mitigate against changing research designs, but this too has limitations in that many sites are unique at some level when considering lithic assemblage content, time periods, lithologies, population size etc. (Smith 1994). Brown (2008) went to the extent of promoting the conservation of entire landscapes to get around this issue. Furthermore, there are limitations on the detail and quality of data available on the Register of Aboriginal Sites. There is a paucity of information concerning what sites have been destroyed,

cultural politics determine that some reports are not to be listed and there is a high degree of variability between consultants' reporting standards.

Rarity of a particular site type or feature also needs to be considered. Some research questions, like those posited by Brown (1987) regarding the spatial distribution of sites in the Hamersley Plateau for example, requires a range of site types, site sizes and landform units to address the question. For this reason, it is important to assess how common a site is to avoid bias in the research data set.

The concepts of research potential, representatives, rarity and integrity are considered, along with the research questions detailed in Table 3 in determining the importance of an archaeological site and our professional opinion regarding its status under Section 5 of the AHA. Any value attributed, however, is subject to change owing to variations in research design, site integrity and the decreasing extent of the archaeological record owing to development.

SGH does recognise that archaeological/scientific significance is not the only determinant of a site's value. These places may have a range of other values (e.g., historic, social, aesthetic, cultural, environmental) for different individuals or groups (Australia ICOMOS Burra Charter 1999; Sutton, Huntley et al. 2013) which should also be taken into account before any final determination about site management takes place.

Table 3: Standard of information required for significance assessment and basic description on the Swan Coastal Plain.

Research Theme	Research Questions	Associated Site Types	Associated Site Type Attributes	Required Archaeological Features	Required Artefact Attributes	Isolated Artefact Attributes	Example References
Timing & Nature of Occupation	What is the antiquity of human occupation across the Swan Coastal Plain? And how does this contribute to our understanding of the timing, nature and rate of occupation over time in this region?	Sites with stratified cultural deposits or other datable materials.	Presence of archaeological features. Location. Environmental context. Geomorphic zone	Charcoal or other organic material for radiocarbon dating. Soil samples associated with artefacts for thermoluminescence dating. Presence of artefacts in dateable deposits. Presence of faunal materials in association with cultural materials	Faunal: Relative species abundance, presence of cultural markings on bones.	N/a	Pearce and Barbetti (1981), Bowdler, Strawbridge et al. (1991), Pearce (1979), Pearce (1982), Hallam (1987), Anderson (1984)
Timing & Nature of Occupation	What was the pattern and intensity of occupation of the Swan Coastal Plain and what does this suggest about sites in the different geomorphic zones?	Sites with stratified cultural deposits or other datable materials.	Presence of archaeological features. Location. Environmental context. Number and type of archaeological site	Charcoal or other organic material for radiocarbon dating. Soil samples associated with artefacts for thermoluminescence dating. Presence of artefacts in dateable deposits. Stone artefacts and other cultural materialPresence of faunal materials in association with cultural materials	Lithology variation in relation to possible source locations, Increasing site use as seen in increased artefact discard rates, debitage type, formal tool types, maximum dimensions	N/a	Hallam (1987), Anderson (1984), Bowdler, Strawbridge et al (1991)
Timing & Nature of Occupation	What does the age of the wetland areas imply about the age of associated sites? If wetlands were not present when the sea level was lower, what was the pattern and intensity of Swan Coastal Plain occupation and what does this suggest about site distribution?	Sites with stratified cultural deposits or other dateable materials within the Bassendean Dune System.	Presence of archaeological features. Location. Environmental context. Geomorphic zone	Charcoal or other organic material for radiocarbon dating. Soil samples associated with artefacts for thermoluminescence dating. Presence of artefacts in dateable deposit.Stone artefacts and other cultural material. Presence of faunal materials in association with cultural materials. Potential for palaeo-environmental data	Stone Artefact lithologies, Debitage Type, Formal Tool Type, Max. Dimensions. Faunal: Relative species abundance, presence of cultural markings on bones.	Number; Location.	Meagher (1974); Anderson (1984); Hallam (1987); Bowdler, Strawbridge et al. (1991), Kost (2013)
Lifestyle Patterns & Behaviour	Why is the recorded number of sites within the Bassendean Sands formation higher compared to other zones? And what does this indicate about demographic changes, mobility and land use patterns over time.	All archaeological sites within the Bassendean Dune System	Location, Presence of archaeological features, Environmental Context, Assemblage complexity, Site Type	Stone artefacts and faunal remains, scarred trees. Retouched/Utilised artefacts and other cultural materials.	Lithology variation in relation to possible source locations, Increasing site use as seen in increased artefact discard rates, debitage type, formal tool types, maximum dimensions	N/a	Meagher (1974); Anderson (1984); Hallam (1987); Bowdler, Strawbridge et al. (1991), Dortch (2002), Dortch (2004)
Lifestyle Patterns & Behaviour	What technological changes over time are discernible in stone artefact assemblages as a result of the loss of sources of fossiliferous chert?	All sites containing artefacts manufactured from fossiliferous chert, Chronological control.	Location, Environmental Context, Assemblage Complexity, Some means of Dating	Presence of Stone Assemblages, Presence of Fossiliferous Chert.	Lithology variation in relation to decreasing chert, Increasing site use as seen in increased artefact discard rates, debitage type, formal tool types, maximum dimensions, Cortex coverage, termination types	N/a	Ferguson (1980), Glover and Lee (1983), Schwede (1990), Dortch (2002), Worrell (2008)
Social Interaction	What is the spatial distribution and nature of fossiliferous chert artefacts within the broader south-west region and what does this suggest about past trade and exchange networks?	All sites containing artefacts manufactured from fossiliferous chert, Chronological control.	Site type, Location and inferred use, Traditional owner opinions and interpretations	Location, Associated archaeological features	Lithology, Dorsal cortex extent, platform types, artefact types, heating, dorsal scars, maximum dimensions, presence /absence of cores, flake termination types.	Location; Formal Tool Types	Hallam (1989), Tilbrook (1983), Le Souef (1993), Dortch (2002)
Post-colonial Contact	What archaeological evidence is there for the maintenance and adaptation of Aboriginal life ways following European colonisation?	Sites containing post-colonial evidence of Aboriginal cultural practices	Fringe camps, Missions, Reserves, Farms, Prisons, 'Native Institutions, Historical cemeteries and burial sites	Reworked materials for use as traditional Aboriginal implements. Marked burial sites, material used for dwellings, historic building remains	Location, Number and Type, Approximate dates of materials if available	N/a	Tilbrook (1983), South West Aboriginal Land and Sea Council (2010).

SURVEY RESULTS

DESKTOP SURVEY RESEARCH

As mentioned, Coldrick, Hovingh and McDonald (2014) conducted a comprehensive desktop review of the heritage places previously identified within the NorthLinkWA corridor. The findings of the review suggested that the NorthLinkWA Project and its surrounds have been subject to numerous contract and academic archaeological investigations. Many archaeological sites have been identified and the record itself shows the changing nature of archaeological recording practices, especially in relation to site location and collection activities (2014:17). This has been discussed in the Legal and Ethical Context of this report.

A total of 28 Aboriginal Sites and 'Other Heritage Places' were identified during the desktop review, and of these 14 are considered to have archaeological materials (see Table 4), including four ethnographic camps (Table 5). Only these 14 heritage places are considered in this report. These are discussed in detail in Coldrick, Hovingh and McDonald (2014). In addition, the DAA online AHIS system suggests that the NorthLinkWA corridor also intersects with the public polygon boundaries for Registered Sites DAA Place ID 3426 (South Ballajura Camp) and Place ID 3840 (Bennett Brook: Camp Area). SGH has been advised by DAA that their non-public boundaries lie outside the proposed development area and will not be impacted.

Table 4: Archaeological sites previously identified along the NorthLinkWA corridor

Place Id	Legacy id No.	Name	Status	Type	Project Area	Notes
3178	S00704	COLLIER ROAD	Stored Data / Not a Site	AS	TGS	All visible artefacts were collected. Later examinations showed no artefacts.
3179	S00705	CLUNE STREET	Registered Site	AS	TGS	All visible artefacts were collected, including ochre.
3180	S00706	MARSHALL, BEECHBORO	Registered Site	AS	PDNH	Disturbed by construction of Marshall Road. All visible artefacts were collected. Repeated subsequent visits found very little.
3326	S00170	BAYSWATER 1 - 3.	Registered Site	AS	TGS	Archaeological excavations took place. All surface and excavated materials collected.
3552	S02435	MARSHALL/DELLA ROADS.	Stored Data / Not a Site	AS	PDNH	Small, low density scatter of quartz artefacts. Previously disturbed.
3618	S02356	WHITEMANS CUTTING	Lodged	AS	PDNH	All visible artefacts were collected. Later examinations showed no artefacts.
3619	S02357	WHITEMANS QUARRY	Lodged	AS	PDNH	All visible artefacts were collected.
4039	S01420	BROUN AVENUE	Stored Data / Not a Site	AS	TGS	All visible artefacts were collected.
4099	S01285	BEECHBORO ROAD	Stored Data / Not a Site	AS	PDNH	All visible artefacts were collected. Later examinations showed no artefacts.
21994		Neaves Road Creek Field Site 01	Lodged	AS	PDNH	Potential subsurface deposits

AS = Artefacts/Scatter.

Table 5: Ethnographic sites identified along the NorthLinkWA corridor that may have archaeological material

Place Id	Legacy id No.	Name	Status	Type	Project Area	Notes
3749	S02199	BAYSWATER CAMP 1.	Stored Data / Not a Site		TGS	No archaeological materials were noted. Previous investigation noted industrial premises built on area.
18735		Beechboro Camping Area	Stored Data / Not a Site		PDNH	No archaeological materials noted.
20058		Temporary Camp	Registered Site		PDNH	No archaeological materials noted.
21393		NOR/02 Lightning Swamp	Registered Site	Ceremonial, Mythological	PDNH	No archaeological materials noted.

The desktop assessment suggests that the sites along the NorthLinkWA projects are consistent with those found elsewhere on the Bassendean Sands formation: generally moderate to large in size, on sandy crests within 350 m of a water source (such as swamps, creeks, rivers, lakes etc.) and comprised of quartz, fossiliferous chert, silcrete and mylonite artefacts (after Edwards 2008). Some, such as DAA Place ID 3178 had ochre.

Many of the artefacts were removed from DAA Place IDs 3178, 3179, 3180, 3326, 3618, 3619, 4039 and 4099 during the Swan Area Archaeological Survey (SAAS) in the 1970s (Hallam 1972; Hallam 1986; Hallam 1987). Verbal communication with Dr Moya Smith at the Western Australian Museum suggests that these artefacts are still present within their collections.

The density of sites nearer the Perth metropolitan area is marked, and is likely reflective of the intensity of development and related survey coverage. It is expected that more sites will be located in the northern parts of the survey area where surface vegetation is more prevalent and fewer surveys have occurred.

FIELD SURVEY

Field Survey Outcomes

The survey team inspected the corridor as demarcated in Figure 1 and as supplied as GIS shape-files along with this report. As discussed in the Local Environment & Urban Impact section, much of the NorthLinkWA corridor has been subjected to myriad land use practices. This, coupled with the variable vegetation sizes and types, left much of the ground surface obscured. The results are listed in Table 6 and Table 7.

Table 6: Disturbance variability over the survey area

Disturbance Level	Area (km2)	Percentage
Very Little Disturbance Evident	2.66	25.05%
Surface Level Disturbance	6.75	63.53%
Surface and Subsurface Disturbance	1.21	11.43%

Table 7: Ground surface visibility over the survey area

Ground Surface Visibility	Area (km2)	Percentage
76-100%	0.15	1.43%
51-75%	0.64	6.02%
26-50%	2.70	25.39%
0-25%	7.13	67.16%

Despite the visibility limitations of the ground surface, two previously unrecorded artefact scatters (NorthLink14-01 and NorthLink14-02) were identified and recorded.

NorthLink 14-01 was recorded 3.6 m outside the western boundary of the survey area. As this site is unlikely to be impacted by the NorthLinkWA Project, the place was recorded to a preliminary level and basic observations were recorded. Similarly, NorthLink 14-02 was identified on the outskirts of the survey area, protruding 17 m into the survey corridor.

These archaeological places were identified as being potential 'Aboriginal sites' owing to the presence of a range of artefact sizes and types, the close proximity of lithologically-similar artefacts and areas that suggest some site integrity. These places were considered to have some potential to address current and timely research questions on a State and National level, as listed in Table 3.

Both of these places are reported in Appendix 3 and are summarised as follows:

NorthLink14-01 An artefact scatter that lies on the eastern side of a low dune overlooking a grassy paddock. Its primary feature is a small clearing in the south-eastern corner, where rabbits have exposed both Aboriginal and non-Aboriginal artefacts that clearly lie beneath the ground surface. There are an estimated 60 visible artefacts, comprised of both quartz and silcrete assemblages.

NorthLink 14-01 is considered to have archaeological significance for its ability to address the pattern and nature of Aboriginal occupation of this portion of the Swan Coastal Plain, particularly addressing archaeological concerns related to post-colonial contact (eg. Tilbrook 1983; South West Aboriginal Land and Sea Council 2010). Further analysis of both the Aboriginal and non-Aboriginal materials may provide insight into the maintenance and adaptation of Aboriginal life in the post-contact period. Subsurface investigations may be applicable.

NorthLink14-02 This site is a scatter with an estimated 100 visible artefacts that have been exposed by off-road vehicle use. While most of the assemblage is manufactured from quartz, a single piece of fossiliferous debris and a silcrete flake were also present. Like NorthLink 14-01, this site is also considered to have archaeological significance for its ability to address the pattern and nature of Aboriginal occupation of this portion of the Swan Coastal Plain including research questions about the spatial distribution and technological change in fossiliferous chert assemblages. While some areas have been subjected to disturbance, it is likely that intact areas within the place (as defined by the boundary coordinates above) may still be able to address these concerns.

No archaeological material was identified at the four ethnographic camps within the survey area (DAA Place IDs 3749, 18735, 20058 and 21393).

In addition to the newly identified archaeological sites, 44 isolated finds were identified across the surveyed area and are listed in full in Appendix 1.

Previously-recorded Heritage Places

As part of the heritage management process, the survey team revisited each of the 15 previously recorded heritage places (as listed in Table 4 and Table 5). Only DAA Place ID 21994 (Neaves Road Creek Field Site 01) was relocated, although two isolated finds were identified in proximity to DAA Place ID 3179 (Clune Street).

However, DAA Place ID 21994 was not found in the position marked on the DAA's AHIS. Instead, archaeological material was identified approximately 186 m to the north-east in a context similar to that

described by De Gand and Morse (2000:38). The variation in location is consistent with AGD84/GDA94 projection error. As a result, the heritage place is actually 75 m north of the proposed NorthLinkWA corridor and should not be impacted by the proposed works. The new boundary coordinates are as shown in Table 8:

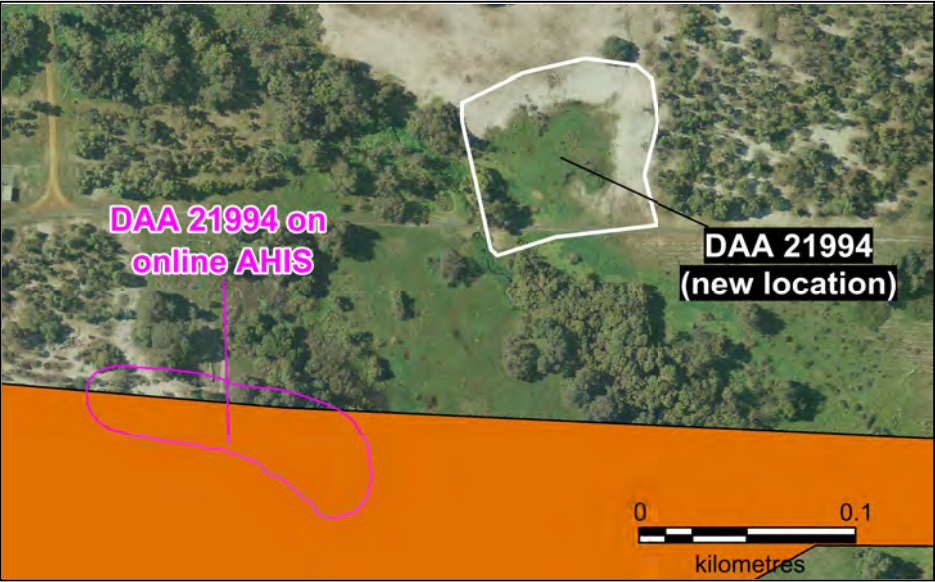
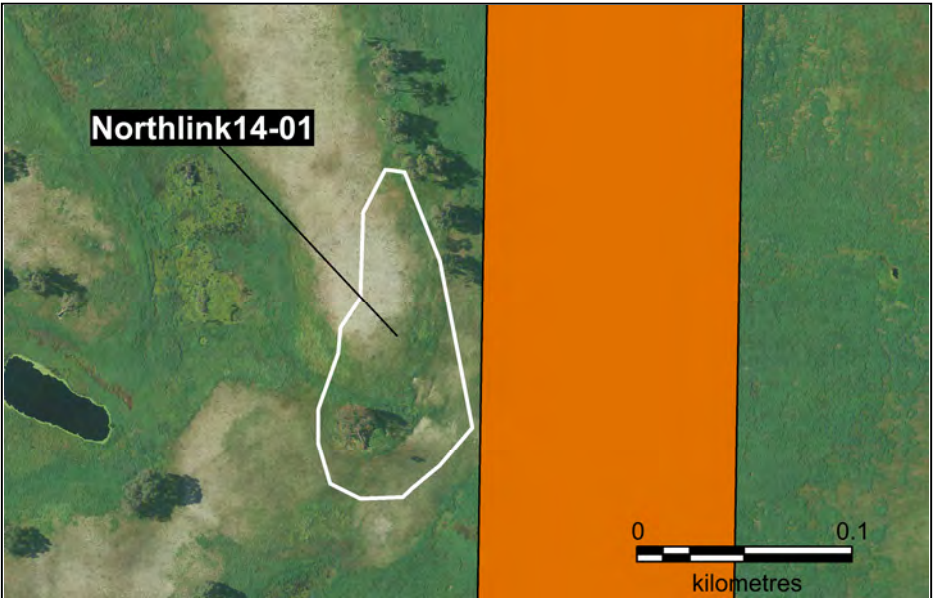
Table 8: Revised boundary coordinates for DAA Place ID 21994

Point	Easting mE	Northing mN	Point	Easting mE	Northing mN
1	403524	6497512	9	403615	6497504
2	403524	6497504	10	403612	6497524
3	403526	6497495	11	403605	6497530
4	403538	6497444	12	403589	6497532
5	403541	6497441	13	403581	6497533
6	403568	6497450	14	403552	6497526
7	403615	6497456	15	403524	6497512
8	403609	6497479			

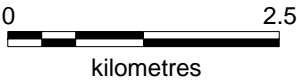
GDA94: Zone 50J

FIGURE 6:
Survey
Results of the
NorthLink WA
Corridor -
North End

- Tonkin Grade Separation
- Swan Valley Bypass
- Selected Previously Recorded Sites on the AHIS Register (Not all)
- Newly Recorded Sites



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FIGURE 7:
Survey
Results of the
NorthLink WA
Corridor -
South End

- Tonkin Grade Separation
- Swan Valley Bypass
- Selected Previously Recorded Sites on the AHIS Register (Not all)
- Newly Recorded Sites



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DISCUSSION

The entire NorthLinkWA corridor (as shown in Figure 1) was inspected during the field investigation. Despite the lack of ground surface visibility and the intensity of past ground disturbance, the survey team identified and recorded two previously unrecorded artefact scatters (NorthLink14-01 and NorthLink14-02). In addition, 44 isolated finds were recorded.

The survey team also revisited 11 previously recorded artefact scatters and four ethnographic camp sites. Of these, only DAA Place ID 21994 (Neaves Road Creek Field Site 01) was relocated, albeit 186 m northeast of its mapped location on the DAA's AHIS. The variation is consistent with AGD84/GDA94 projection errors. The lack of other previously recorded sites is attributed mostly to site disturbance and artefact collection procedures undertaken as part of the Swan Area Archaeological Survey in the 1970s.

MANAGING LOW VISIBILITY

The low numbers of archaeological sites in undisturbed parts of the survey area is unusual and is not considered a reflection of Aboriginal occupation patterns. Instead, this result is attributed to the low levels of ground surface visibility across most of the survey area.

As mentioned in the Field Results, much of the ground surface was not visible: see for example Photo 3. Field observations suggest that 92.55% of the survey area was obscured up to 50%. There is a strong likelihood that subsurface materials may be present – especially with the grouping of isolated artefacts near the Brand Highway and Neaves Road. This sentiment was also expressed on numerous occasions by the Noongar representatives, who also raised concerns about the potential for skeletal material in sandy soils. One burial, for example, was reported outside the NorthLinkWA corridor at Whiteman Park during the corresponding ethnographic field survey (for more information, refer to Amergin's ethnographic report).

To manage the potential for subsurface materials, monitoring by archaeologists and/or trained members of the Noongar community should take place in areas that have high potential for sites with some archaeological integrity. Strawbridge's collation and computer analysis in 1987 identified key factors that relate to the distribution of archaeological sites on the Swan Coastal Plain. This demonstrated that archaeological sites tend to occur:

- In areas within 350 m of a water source; and
- on well-drained sandy dunes (such as NorthLink 14-01).

These areas should be monitored, taking into consideration those:

- close to known archaeological materials, such as isolated finds, previously recorded sites and newly-recorded heritage places; and
- In areas where the ground has not been subjected to both surface and subsurface disturbance.

These areas requiring further monitoring have been mapped and illustrated in Figure 8.

SITE MANAGEMENT

Newly-recorded archaeological sites

NorthLink14-01 and NorthLink14-02 are discussed in detail in Appendix 3, which describes the sites and lists their scientific significance after taking into consideration a range of factors such as site integrity, rarity, representativeness and research potential. As a consequence, these two artefact scatters may be considered by the ACMC to be Aboriginal sites that should be preserved under Section 5(c) of the *Aboriginal Heritage Act*

1972. Both assemblages are the product of practices connected to the traditional cultural life of Aboriginal people. As they have some archaeological importance, they may also be considered Aboriginal sites under Section 5(a). Further, there is a possibility that the individual artefacts within the sites may also be protected under Section 6.

As a consequence, MRWA should inform relevant staff and contractors about the location of NorthLink14-01 and NorthLink14-02 and protect them from disturbance during implementation of the proposed works. As NorthLink 14-01 is 3.6 m outside the survey area and NorthLink 14-02 extends only 17 m into the western boundary of the survey area (see Figure 6), MRWA may be able to adjust their work programme to avoid the cultural material. If not, MRWA will need to apply for a notice under Section 18 of the AHA to use the land on which this place is located. Other stakeholders, such as the landowners, should be informed about the site(s) on their property to ensure continued protection.

Both sites should be clearly delineated prior to nearby ground disturbance (using temporary markers and/or fencing, for example) and existing induction programmes/materials altered to alert staff in the area about the restrictions in entering or working near these heritage areas. Physical demarcations and barriers may require periodic maintenance to ensure effectiveness.

Irrespective of their status with respect to the *Aboriginal Heritage Act 1972*, these places may also be of importance and significance to the Noongar people. MRWA should continue to consult with the Noongar community on the documentation and management of these places where required.

Should disturbance be approved, the impact to the archaeological and/or cultural values of these heritage places should be mitigated by the subsequent analysis and salvage of the related artefacts. It is our professional view that NorthLink14-01 will require further recording and possible excavation prior to disturbance.

In addition, 44 isolated artefacts were identified within the survey area. These are not considered to be Aboriginal sites under the AHA nor were they of any import to the Noongar representatives on the survey. No further protection and/or management of these are warranted.

Previously-recorded archaeological sites






Of the previously recorded sites, only DAA Place ID 21994 was identified, 186 m north-east of its mapped location on the DAA's AHIS database (see Figure 6). This new location places the site 75 m outside of the proposed development area and consequently the site should be protected from development.

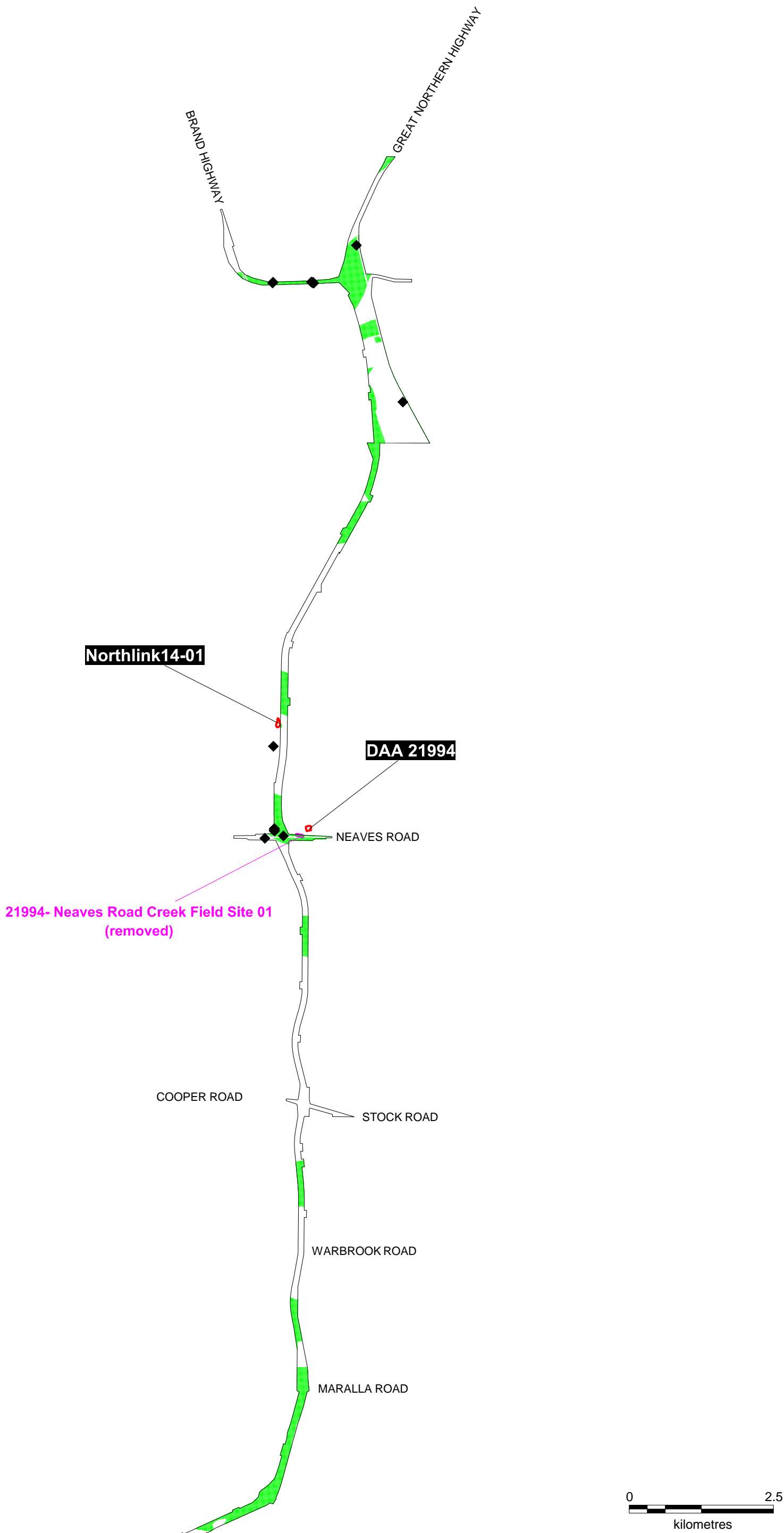
After discussions with DAA representative Cesar Rodriguez, SGH will send a letter to the DAA to inform them of the administrative error. While the site will not be impacted by the NorthLinkWA project, MRWA should nevertheless contact the DAA before working within the original Place ID 21994 polygon to ensure there is no breach of Section 17.

The other ten artefact scatters could not be located. As a result, should MRWA require the land they are on, they should:

- a) Commence work within the boundaries of Place ID 3178, 3552, 4039 and 4099 as these places are listed as 'Stored Data/Not a Site' and are not protected under the AHA (for a full explanation of DAA site status, please refer to Coldrick, Hovingh and McDonald (2014:6));
- b) Seek formal, written advice from the DAA as to whether Ministerial consent is required under Section 18 of the AHA to use the land under Place ID 3179, 3180 and 3326, as these sites are Registered Sites, and apply for Ministerial consent if required; and
- c) If required, also give Notice under Section 18 of the AHA to use the land under Place ID 3618 and 3619 as these are Lodged Sites under the AHA and are still awaiting a determination by the ACMC.
- d) Should notice under Section 18 be successful, each area should be monitored to minimise the risk that other materials may be subsurface.

FIGURE 8:
Proposed
Areas to be
Monitored -
North End

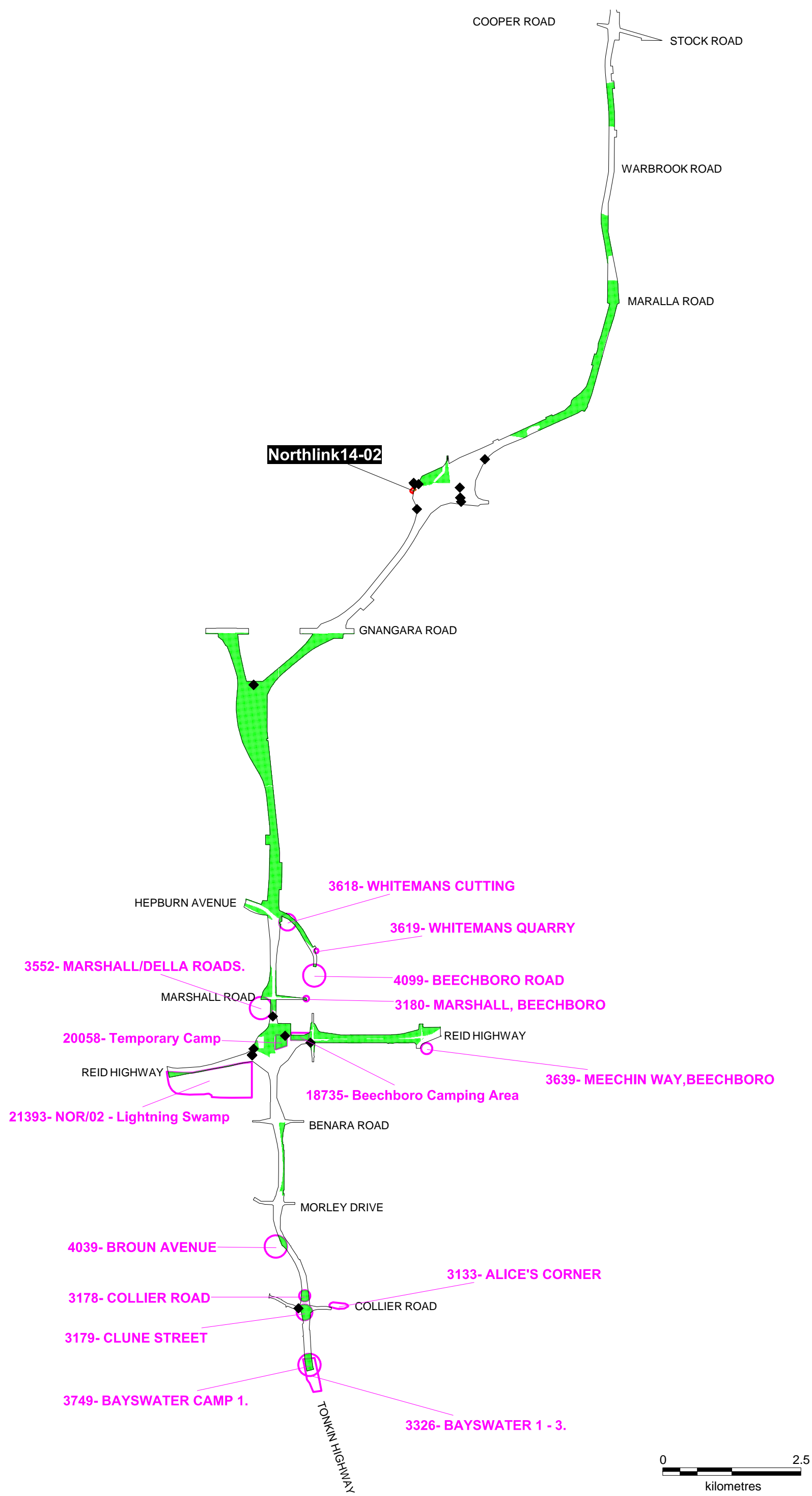
-  Survey Area
-  Selected Previously Recorded Sites on the AHIS Register (Not all)
-  Newly Recorded Sites
-  Area to be monitored during development
-  Isolated Finds



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FIGURE 9:
Proposed
Areas to be
Monitored -
South End



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CONCLUSION

The NorthLinkWA project, measuring approximately 44 km in length and ranging between 100 m and 1 km in width, stretches from Bassendean and extends out to Muchea. The area covers a range of land use practices associated with transportation, urbanisation through to pastoral practices, each of which have left a distinct imprint on and within the ground.

These activities, coupled with the broad collection and removal of artefacts during 1970s research, have had a marked impact on the preservation of archaeological materials in the Swan Coastal Plain. Of the 11 previously recorded artefact scatters in the vicinity of the NorthLink project, only one (DAA Place ID 21994) appears to be extant.

The archaeological survey, which took place in late November and early December 2014, identified two previously unrecorded artefact scatters, NorthLink 14-01 and NorthLink 14-02, in areas consistent with previously noted archaeological patterns. More were expected and it is considered that low ground surface visibility obscured other Aboriginal sites.

To minimise further impact to the archaeological record, this investigation has identified a series of recommendations including monitoring development within relatively undisturbed areas with high potential for archaeological materials. This management process was supported by the Noongar representatives to also manage possible skeletal materials.

Other recommendations are made to protect the newly-recorded sites and manage the community, legal and archaeological concerns of the previously recorded heritage places.

Otherwise, it is recommended that the work may proceed.

RECOMMENDATIONS

Based on the findings of this survey:

- 1) It is **recommended** that MRWA ensures that all relevant staff/contractors are informed:
 - a) about the presence and location of Aboriginal archaeological sites NorthLink 14-01 and NorthLink 14-02 which are the product of practices connected to the traditional cultural life of Aboriginal people and may be considered Aboriginal sites under Section 5(a) of the *Aboriginal Heritage Act 1972*. These sites also represent past Aboriginal land use practices and are therefore of archaeological interest and may therefore also be classified as sites of importance and significance to the cultural heritage of the State that should be preserved under Section 5(c); and
 - b) that the artefacts within the sites have been made or modified by Aboriginal people as part of their cultural practices and may be considered Aboriginal objects under Section 6(1) of the *Aboriginal Heritage Act 1972*.
- 2) It is **recommended** that MRWA consult with the Department of Aboriginal Affairs about about working within the existing DAA Place ID 21994 boundaries, which was verified in the field to lie outside the NorthLinkWA corridor;
- 3) It is **recommended** that MRWA continue to consult with SWALSC and other relevant Aboriginal people on the documentation and management of NorthLink 14-01 and NorthLink 14-02 even if the ACMC does not consider them Aboriginal Sites under Section 5 of the *Aboriginal Heritage Act 1972*;
- 4) It is **recommended** that other stakeholders, such as the landowners, be informed about the site(s) on their property.

- 5) It is **recommended** that prior to nearby ground disturbance, sites NorthLink 14-01 and NorthLink 14-02 should be clearly delineated using physical markers and/or fencing and existing induction programmes/materials altered to alert staff in the area about the restrictions in entering or working near these heritage areas. Physical barriers may require periodic maintenance to ensure effectiveness.
- 6) It is **recommended** that MRWA should consult with SWALSC and other relevant Aboriginal people before commencing work within the boundaries of Stored (archaeological) places 3178, 3552, 4039 and 4099. There are no legal impediments for proposed work at these places;
- 7) It is **recommended** that should any ground disturbance be proposed for Registered (archaeological) Sites/Lodged Places 3179, 3180, 3326, 3618, 3619, NorthLink 14-01 and NorthLink 14-02, that:
 - a) MRWA seeks formal, written advice from the DAA as to whether Ministerial consent is required under Section 18 of the AHA for the proposed works;
 - b) consultation with SWALSC and other relevant Aboriginal people takes place;
 - c) where necessary, an application is made under Section 18 of the *Aboriginal Heritage Act 1972* to use the ground on which the sites are located; and
 - d) where necessary, an application is made under Section 16 of the *Aboriginal Heritage Act 1972* to assess the subsurface potential of NorthLink 14-01.
- 8) It is **recommended** to the ACMC that the 44 isolated artefacts are not considered to be Aboriginal sites under Section 5 of the *Aboriginal Heritage Act 1972*;
- 9) It is **recommended** that monitoring by archaeologists and/or appropriately trained members of the Noongar community takes place in areas that have high potential for sites with some archaeological integrity; and
- 10) It is **recommended** to MRWA that the work may proceed as planned subject to the above recommendations and any additional recommendations made in the corresponding ethnographic report.

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APPENDICES

APPENDIX 1- ISOLATED ARTEFACTS

Isolated Artefacts recorded during the survey

Number	Easting	Northing	Artefact Type	Lithology	No. Retouched Edges	Total Length of Retouch (mm)	Overhang Removal	Comments
1	398080	6469471	Proximal Flake Fragment	Quartz	0	0		
2	397784	6474402	Complete Flake	Quartz	0	0		
3	397191	6474042	Complete Flake	0	0	0		
4	397191	6474042	Debris	Chert	0	0		
5	397215	6474160	Complete Flake	Quartz	0	0		
6	397187	6474054	Complete Flake	Quartz	0	0		
7	397145	6480750	Complete Flake	Quartz	0	0		
8	397145	6480750	Complete Flake	Quartz	0	0		
9	397145	6480750	Marginal Flake Fragment	Quartz	0	0		
10	402853	6506956	Distal Flake Fragment	Quartz	0	0		
11	403546	6506958	Debris	Quartz	0	0		
12	403557	6506950	Complete Flake	Quartz	0	0		
13	403541	6506955	Medial Flake Fragment	Quartz	0	0		
14	403538	6506956	Distal Flake Fragment	Quartz	0	0		
15	403545	6506960	Debris	Quartz	0	0		
16	403516	6506967	Complete Flake	Quartz	0	0		
17	404293	6507612	Complete Flake	Quartz	0	0		
18	402947	6498905	Proximal Flake Fragment	Quartz	0	0		
19	402843	6506943	Complete Flake	Quartz	0	0		
20	400067	6483963	Debris	Quartz	0	0		
21	400864	6484105	Complete Flake	Silcrete	0	0		
22	400851	6484175	Complete Flake	Quartz	0	0		
23	400846	6484176	Debris	Quartz	0	0		
24	400837	6484361	SPC	Quartz	0	0		
25	405128	6504904	MPC	Quartz	0	0		
26	400003	6484436	Complete Flake	Quartz	0	0		
27	400018	6484412	Debris	Quartz	1	30		
28	400090	6484414	Complete Flake	Quartz	1	0		
29	401287	6484880	Debris	Quartz	0	0		
30	403544	6506959	Complete Flake	Quartz	0	0		
31	403137	6497354	Complete Flake	Quartz	0	0		
32	402816	6497308	Complete Flake	Quartz	0	0		
33	398245	6474283	Medial Flake Fragment	Quartz	0	0		
34	397559	6474752	Debris	Quartz	0	0		
35	402978	6497478	Proximal Flake Fragment	Quartz	1	0		Scraper
36	402978	6497478	Debris	Quartz	0	0		
37	402976	6497450	Proximal Flake Fragment	Quartz	0	0		Blade
38	402976	6497450	Debris	Quartz	0	0		
39	402976	6497450	Debris	Quartz	0	0		
40	402980	6497445	Complete Flake	Quartz	0	0		
41	402980	6497445	Complete Flake	Quartz	0	0		
42	402980	6497445	Complete Flake	Quartz	0	0		
43	402980	6497445	Proximal Flake Fragment	Quartz	0	0		
44	402979	6497435	Complete Flake	Quartz	0	0		

APPENDIX 2 – INFORMATION CAPTURED DURING SITE IDENTIFICATION SITE RECORDING

Data to be captured at a Site/Feature Level

Site Type/Archaeological Features Present

The DAA currently recognises 14 types of Aboriginal site, which are framed in the context of section 5 of the AHA (Department of Indigenous Affairs 2010):

Artefacts	Fish Trap	Man-made Structure
Mythological	Repository/Cache	Ceremonial
Grinding Patches/Grooves	Midden	Painting
Skeletal Material/Burial	Engraving	Historical
Modified or Scarred Tree	Quarry	

Two of these are considered relevant within the context of this report and are discussed below:

Artefacts “An artefact site is a place where human activity is identifiable by the presence of a portable object/s (e.g., stone, glass, bone, shell) utilised or modified by Aboriginal people in relation to traditional cultural life past or present.”

Man-made Structure “The placement or arrangement, by Aboriginal people, of stone, wood or other material made into a structure for ceremonial or utilitarian purposes.”

In addition, DAA recognises 13 types of supporting information which is recorded along with the above site information. SGH also considers ‘Reduction Area’ to be applicable :

Archaeological Deposit	Birth Place	Camping Place
Hunting Place	Massacre	Meeting Place
Named Place	Mission	Ochre
Plant Resource	Shell	Rock shelter
Water source	Reduction Area	

Three of these are applicable to this report:

Water Source “A source of water, (e.g., gnamma holes, soaks, springs, rockholes), with ethnographic evidence of its use or modification for use by Aboriginal people in connection with traditional cultural life past or present.”

Rock shelter “A place recognisable as a cave or overhang that may have been utilised by Aboriginal people.”

Reduction Area A site, or an area within a site, with an artefact distribution that can be reasonably considered to be the product of on-site knapping and, as such, may add information regarding regional reduction techniques and strategies to archaeological knowledge.

Location

SGH records all site boundaries using a Garmin Hand Held GPS and configured in the GDA94 coordinate system. The coordinates listed in the report are recorded within MGA Zone 50.

Environmental Context

Summary information about the environment around and across the site is recorded and includes topography, ground surface type, potential taphonomic processes that may impact on the work, vegetation types and ground surface visibility.

Water Source

Nearest water source location is recorded using distance and an approximate cardinal point. The intensity or size of the creek is recorded using an ordinal value system (minor creek, drainage channel, major creek etc.) to notionally describe the water source.

Sites with Dating Potential

Many of the archaeological research questions are concerned with initial occupation and changes in Aboriginal subsistence and land-use patterns through time (see Archaeological Context). Only those sites that can be dated using a range of methods (such as radiocarbon dating, thermoluminescence etc.) have the potential to address these concerns. These sites include those with potentially stratified deposits (such as in rockshelters), those in association with organic material (such as baler or charcoal), rock art covered in desert varnish, or pigment art comprised of ochres bound with organic substances and charcoal drawings.

Data captured at an artefactual level

Stone Artefacts

Stone artefacts are the most common type of cultural material. As an assemblage, they can range from broad amorphous scatters to discrete knapping events or single isolated artefacts. As seen in Table 3, stone artefacts have the potential to address current research themes related to artefact reduction strategies and socio-economic patterns of Aboriginal use of the landscape. Key measurements of stone artefacts are generally focussed on providing information about the extent and nature of the reduction event. The measurements used in the current survey are as follows:

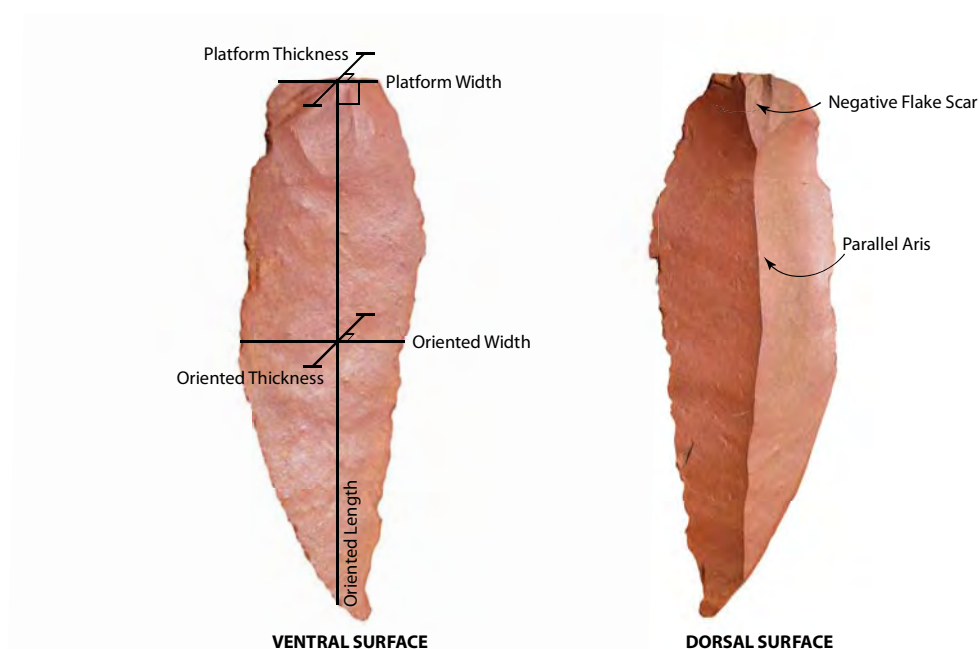
Lithology (Rock Type): Artefacts are first classified into the type of rocks that they were manufactured from. In some areas of Australia, these classifications provide an important contribution towards research questions that assess the transportation and/or trade of suitable raw materials.

The classification of raw material type can be problematic, particularly where external fractured artefact surfaces have been weathered, changing the colour and texture of the visible surface. The macro-blade illustrated in Figure 10, for example, was actually sourced from a quarry where freshly heat-fractured rocks showed the raw material to be of a fine-grain black and white chert.

Oriented Measurements: Oriented Length, Oriented Width and Oriented Thickness are key measurements that have been used to indicate changes in stone tool manufacturing or use (e.g. (Hiscock and Allen 2000)). In an intact reduction sequence, a wide range of flake lengths are expected, as the core is reduced into smaller fragments. Consistency of these variables also suggests that the knapper is following a particular strategy: for example, blades and macro-blade technologies (cf. (Hook 2009)) can be indicated by consistencies in length/width ratios.

The Oriented Length measurement is taken on the ventral surface perpendicular to the striking platform. Oriented Width is measured perpendicular to the Oriented Length, about half way along its length. Oriented Thickness is perpendicular to the Oriented Width (see Figure 10).

Figure 10. Diagram illustrating key measurements on a complete flake.



Platform Dimensions: Platform Width and Thickness are recorded to assist in reduction area interpretation. While problematic on their own, they can be used alongside other variables such as bulb thickness, termination types and presence/absence of errailure scars to suggest which types of reduction methods were being employed, such as hard-hammer vs soft-hammer percussion.

The Platform Width is the longest measurement of the striking platform from the left to right margins.

Platform Type: Platform type is recorded to assist in the determination of the extent of a reduction sequence, and thus the site's potential to address research questions related to knapping strategies. Further, the variable can also be used to help describe the reduction process.

Four types of platforms are considered: Cortical (the platform is totally comprised of a cortical surface), Flat (having no cortex or scars), Faceted (being made up of two or more scars), Crushed (where the platform shows signs of battering).

Proportion of Cortex: The Proportion of Cortex refers to the amount of cortex on the dorsal side of an artefact and can be used to give an indication of reduction intensity. When combined with the Platform Type, it can be used to indicate the extent of a reduction sequence (e.g. (Toth 1985), which has an impact on the ability for a site to address research questions about knapping strategies.

The Proportion of Cortex is recorded as an interval scale variable to the nearest 10%, based on macroscopic estimation.

Proportion of Heat Fracture: Many of the raw stone materials are obtained from sources that have been exposed to extensive fracturing through the natural expansion and contraction of the rock's surface by the environmental conditions. These fracture patterns are only noted on the dorsal surface. The Proportion of Heat Fracture is recorded for the same reasons, and in the same way, as the Proportion of Cortex above. SGH often combines the results with the Proportion of Cortex to help determine the extent of a reduction sequence.

Cortex Type: This variable is used to assist with the general sourcing of stone raw materials. There are generally three categories: Riverine (suggesting that the raw material has been subjected to fluvial action

prior to knapping); Terrestrial (suggesting that the material was sourced from an outcrop in nearby hills/plains); or Unknown (where cortex is present but cannot be reasonably determined).

Negative Flake Scars: This nominal value is generated by counting the number of complete negative flake scars on the dorsal surface. While it is generally indicative of artefact reduction intensity, the variable should be used with caution as reduction removes evidence of previous negative flake scars.

Number of Platforms (Cores): This nominal value records the number of platforms evident on a core from which flakes have been removed. It is used as an indicator of the number of times a core has been rotated and assists with the description of the reduction process. As with the Negative Flake Scars variable, subsequent reduction may have removed evidence of previous platforms thereby reducing the actual Number of Platforms value.

Overhang Removal: Small flake scars directly behind the platform on the dorsal side of a flake are often indicative of overhang removal, a process which knappers use to decrease the exterior angle of a core to increase the predictability of subsequent flake removal and help maintain core morphology (Clarkson and O'Connor 2006). Overhang removal is often employed as a reduction strategy for the formation of macro-blade production and other tools, so this Yes/No value can assist in assessing the research potential of a site.

Retouch Extent: The length of a flake margin that has undergone retouch and/or use-wear. The presence/absence of retouch may impact on site management as microscopic analysis can contribute to site interpretation.

Parallel Arris: The parallel arris is a ridge formed on the dorsal surface from the intersection of two negative flake scars that run generally parallel to the lateral margins (Andrefsky 2005:252). These are often the product of specialised knapping strategies to increase consistency in flake production such as macro-blades.

Formal Tool Types: Formal Tool Types are associated with stone tools that are produced “as a result of extra effort in their production” (Andrefsky 2005:256). They are a useful reference that refer to standardised artefact forms whose temporal and spatial distribution continues to be the subject of debate (for example: macro-blades, tula adzes, backed artefacts etc.).

Presence of Conjoining/Re-fitting artefacts: This is the remounting of detached and objective pieces into their original positions prior to knapping (Andrefsky 2005:260). Doing so serves two purposes: the first is to recreate the reduction process for analysis and the second is to demonstrate the lack of post-depositional disturbance within an assemblage.

Faunal Material

While rare in open archaeological contexts, faunal material is often recorded in stratified contexts and can contribute economic perspectives about Aboriginal resource procurement. Data collected includes relative species abundances (using NISP – Number of Individual Specimens); the association and proximity to other cultural materials and the presence of cultural markings on bones such as butchery marks and heat treatment or burning.

Engravings/Pigment Art

Engravings and Pigment Art (Painting) sites are recorded in a manner that allows for interpretation both in the field and in the laboratory. Photographs are taken to record the motifs, but hand-drawn diagrams are occasionally employed to provide an in-situ interpretation based on the experience of the archaeologist. Details such as the number of motifs; the form of manufacture; the presence of organic binders within the ochre /charcoal pigments all aid in assessing the potential of a site with engravings/pigment art. Other values, such as motif size and colour, are used to aid the site description. Digital applications such as D-Stretch can be applied to better see faded images and aid with superimposition analysis.

Cultural Contact Sites

With the arrival of Europeans in WA, Aboriginal people have by necessity undergone cultural changes as they adapted to restricted land access, new goods and materials and re-location from their homes. Cultural contact sites include artefacts made from European materials, such as ceramics, glass and metal, but also can reflect altered social structures created through housing and changes facilitated by increased availability of transportation, such as the horse as well as the adaptation of traditional cultural practices.

Values recorded include: the classification of artefacts made from European materials; suitable documentation to allow for dating of the materials using dates of manufacture or trends. Gender and socioeconomic issues may also be addressed by cultural contact sites.

APPENDIX 3- SITE ASSESSMENTS

NorthLink 14-01 Artefact Scatter

Boundary Information

Boundary Description

Point	Easting	Northing	Point	Easting	Northing
1	403061	6499272	9	402998	6499306
2	403046	6499254	10	402999	6499318
3	403033	6499243	11	403008	6499332
4	403029	6499239	12	403009	6499372
5	403009	6499238	13	403019	6499392
6	402995	6499245	14	403028	6499391
7	402989	6499264	15	403045	6499350
8	402989	6499280	16	403061	6499272

Datum: GDA 94; Zone 50H

These boundary points are illustrated in the attached Site Plan and have been supplied in a shape-file format (.shp, .shx, .dbf, .sbn) using the GDA94 Datum, Zone 50H.

Boundary Selection Method

The site boundary encompasses the front section of a low dune ridge and encompasses all visible artefacts noted during the survey.

Type of Site

This place is considered to satisfy the following DAA site type(s):

- ☐ Burial ground set aside for Aboriginal burials by tradition, by use or is considered as a reserve
- ☐ Rock art (cave or rock drawings, paintings, stencils)
- ☐ Rock art (engravings)
- ☐ Stone Structures or arranged stones (culturally modified stones)
- ☐ Carved Trees (culturally modified)
- ☐ Storage place where Aboriginal objects have been traditionally stores, are currently stored or will be stored in future
- ☐ Sacred site which is in its entirety is devoted to religious use only, where ancestors or spirit beings reside or where central figures in important spiritual events resides or where events occurred
- ☐ Ritual or established ceremonial site where Aboriginal people communicate with or undertake practices in relation to sacred beliefs
- ☒ Place that is of historical, anthropological, archaeological or ethnographic interest and should be preserved because of its importance and significance to the cultural heritage of the State
- ☒ Places of importance and significance where objects, natural or artificial, used for, or made or adapted for use for, any purpose connected with the traditional cultural life of Aboriginal people, past or present have been left.

Description of the Place, Importance & Significance, Site Condition, Culturally Sensitive Information

Basic Description

NorthLink 14-01 is an artefact scatter lying 3.6 m west of the NorthLinkWA survey corridor and is therefore unlikely to be impacted by the proposed works.

The artefact scatter is on a low north/south oriented sand dune overlooking a grassy paddock. The dune is characteristic of Bassendean Sands: its white sands are reflected in the occasional clearings, particularly in the south-east where most of the artefacts lie. While there is a stand of *Eucalyptus* spp. to the north along a dune ridge, the local vegetation primarily consists of introduced grasses suitable for feeding cattle. Ground surface visibility was estimated at 90% within the sandy clearings decreasing to 20% outside of these areas.

NorthLink 14-01 measures 157 m north-south, 75 m east-west and covers an area of approximately 7,039 m². Artefacts are concentrated at an estimated density of 30 – 40 / 25 m² in the south-eastern sandy exposure and at sparser densities on top of the rise (1 / 100 m²). The artefact population is estimated at 60 pieces and includes both European and Aboriginal artefacts.

Flaked stone artefacts attributable to past Aboriginal cultural practices are made primarily from quartz and silcrete. Artefact types include complete flakes, transverse flake fragments, longitudinal flake fragments and debris. No cores were identified. All identified artefacts were small in size estimated to range between 10 mm and 25 mm.

The close association of the artefacts, and the range of sizes still present onsite, suggest that the place (as defined by the boundary coordinates listed above) is the product of stone reduction behaviour. The presence of numerous non-Aboriginal artefacts (earthenware shards, a plastic bead, clear glass and beer bottle glass fragments) suggests that the site may be associated with the Aboriginal artefacts.

Site Integrity

NorthLink 14-01 is within an open paddock and has likely been subject to land clearing practices, cattle movement and grazing. Further, rabbit warrens were noted in the south-eastern corner close to the main artefact concentration. While the rabbit diggings have disturbed some artefacts, their activities also point to the presence of other subsurface materials which may yet be undisturbed.

Preliminary Assessment of Archaeological Site Significance

As NorthLink 14-01 lies outside the survey corridor, a Site Avoidance recording method was selected to minimise time delays and cost. The following discussion concerning the archaeological significance of NorthLink 14-01 is therefore preliminary and based on field observations, not measured data, and broad comparisons to previously recorded sites within the area. Further recording would be required to fully assess the research potential and archaeological significance of the site.

The archaeological importance and significance of the site also needs to be considered with respect to this site's applicability under Section 5 of the AHA. These are generally determined by rarity, representativeness and the potential to address research questions, although other factors may influence this decision. These are discussed below.

The desktop study of the project area by Coldrick, Hovingh and McDonald (2014) suggests that low density artefact scatters similar to NorthLink 14-01 predominate the currently recorded archaeological record. Many have either moderate or poor integrity and in most instances have not been able to be relocated following the original recordings owing to archaeological collection practices in the 1970s and development (see for example (Coldrick, Hovingh et al. 2014: 18 DAA Site ID 3618 'Whitemans Cutting'). Most places are small or sparse in density with quartz artefacts noted in all sites.

NorthLink 14-01 represents one of few sites along the 44 km NorthLinkWA survey corridor. As such, relatively intact sites such as NorthLink 14-01 are not currently well represented in the current archaeological record.

With reference to Table 3 which lists relevant regional research questions, NorthLink 14-01 has potential to address the following research questions:

- i) What was the pattern and intensity of occupation of the Swan Coastal Plain and what does this suggest about sites in the different geomorphic zones (after Anderson 1984; Hallam 1987; Bowdler, Strawbridge et al. 1991)?
- ii) Why is the recorded number of sites within the Bassendean Sands formation higher compared to other zones? And what does this indicate about demographic changes, mobility and land use patterns over time (Bowdler, Strawbridge et al. 1991)?
- iii) What archaeological evidence is there for the maintenance and adaptation of Aboriginal life ways following European colonisation (Tilbrook 1983; Harrison 2002)?

In summary, NorthLink 14-01 is considered to have archaeological significance for its ability to address the nature and patterning of Aboriginal occupation of this portion of the Swan Coastal Plain. While some areas of the site have been subjected to disturbance, it is likely that intact areas within the place (as defined by the boundary coordinates above) may still be able to address the above research questions. Further analysis of both the Aboriginal and non-Aboriginal materials may provide insight into the maintenance and adaptation of Aboriginal life in the post-contact period. Subsurface investigations may be applicable.

NorthLink 14-01 is therefore considered to have archaeological significance and therefore should be protected under Section 5(c) of the AHA.

Further, the artefacts are considered to be the product of Aboriginal traditional life (as per Section 5(a) of the AHA) as the flaked stone material bears manmade fracture patterns that typify Aboriginal stone artefact archaeological assemblages. The reader is directed to Holdaway and Stern (2011) for more detailed information. Their importance is as discussed above and therefore NorthLink 14-01 may be considered an Aboriginal Site under Section 5(a) of the AHA.

Other stakeholders such as native title claimants, other communities or interest groups may attribute other values to the site. These should be considered in addition to the archaeological significance discussed above.

Management Considerations

NorthLink 14-01 is immediately outside the survey corridor and is not likely to be disturbed as part of the NorthLinkWA project. As such, it is **recommended** that Main Roads Western Australia (MRWA) should ensure it is protected in the short term from nearby development and in the long-term from highway users.

Should the land on which the site is located be required, it is **recommended** that further artefact recording be undertaken to fully assess the archaeological significance of the site. Permission under Section 16 of the AHA may also be required to investigate the subsurface potential of the place. Main Roads WA should then apply for a Section 18 under the AHA to use the land.

Should ground disturbance nearby take place, it is **recommended** that monitoring take place by appropriately trained members of the local Noongar community and/or archaeologists during initial ground clearance to ensure that the site is not impacted by the proposed works.

Conclusion & Recommendations

In summary, NorthLink 14-01 is a small artefact scatter that was likely used on a small number of occasions. The flaked stone objects within the place are considered to be the product of Aboriginal traditional cultural practices as described above with associated European artefacts. Its archaeological significance lies in its

contribution to the current limited archaeological record in this area, its ability to contribute to regional discussions about Aboriginal land-use patterns on the Swan Coastal Plain and potentially contribute to research concerning post European contact Aboriginal lifeways.

As a consequence, NorthLink 14-01 may reasonably be considered an Aboriginal site under Sections 5(a) and 5 (c) of the *Aboriginal Heritage Act 1972*.












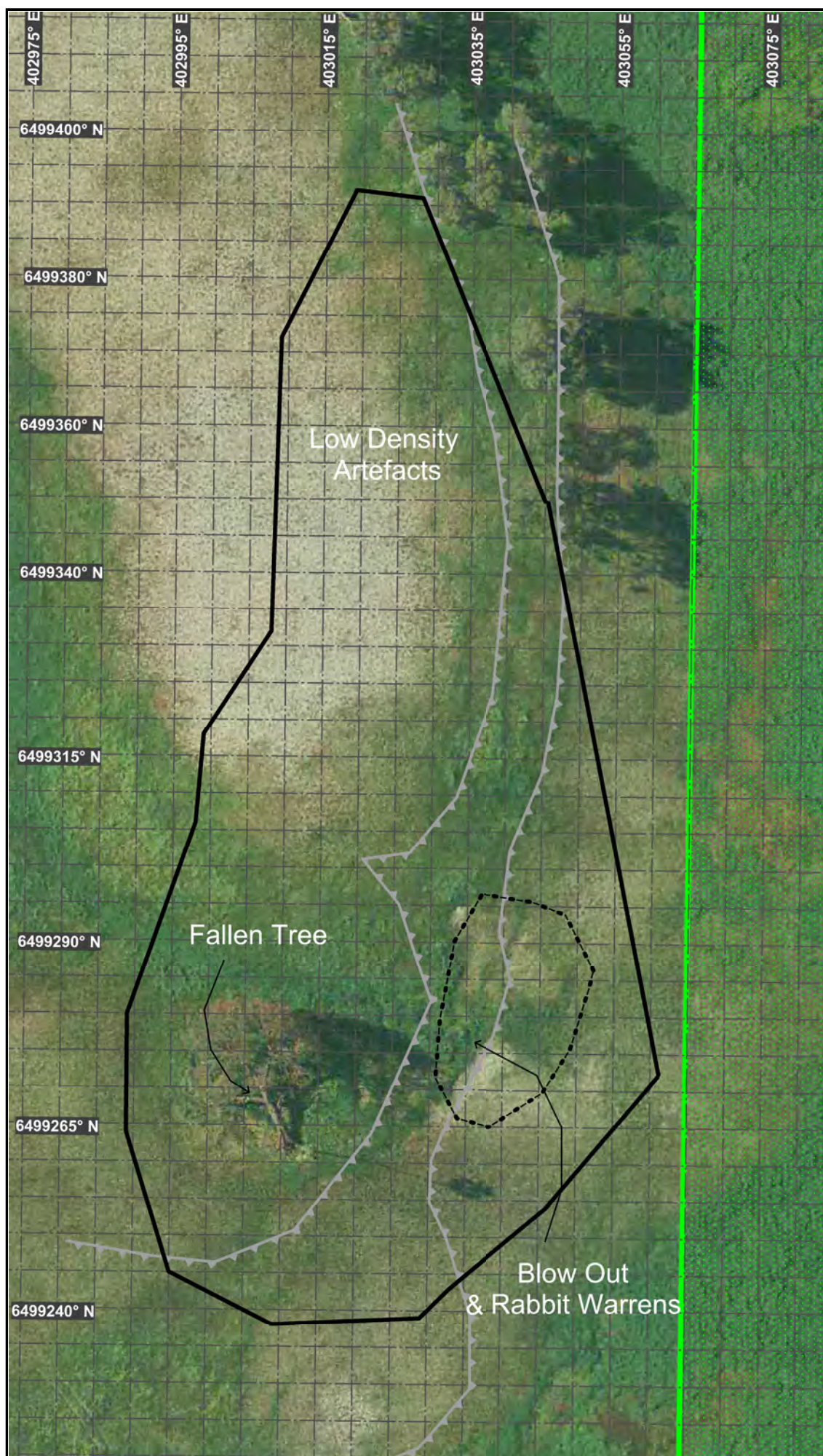
SNAPPY GUM
HERITAGE SERVICES

Site Plan

NORTHLINK14-01

LEGEND

-  Artefact
-  Artefact Concentrations
-  Slopes (Arrows point down)
-  Grindstones
-  Mullers
-  Vehicle Track
-  Ground disturbance
-  Boundary
-  Project Area



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Photo 4: View to SE with Leroy Corunna across sandy exposure



Photo 5 (L): View of rabbit warrens



Photo 6 (R): View silcrete artefact in situ



Photo 7 (L): Close up view plastic bead



Photo 8 (R): View of brick

NorthLink 14-02 Artefact Scatter

Boundary Information

Boundary Description

Point	Easting	Northing	Point	Easting	Northing
1	399986	6484248	8	400017	6484329
2	399971	6484259	9	400039	6484314
3	399959	6484263	10	400035	6484310
4	399946	6484281	11	400024	6484310
5	399941	6484298	12	399996	6484282
6	399963	6484320	13	399986	6484248
7	399982	6484344			

These boundary points are illustrated in the attached Site Plan and have been supplied in a shape-file format (.shp, .shx, .dbf, .sbn) using the GDA94 Datum, Zone 50H.

Boundary Selection Method

The site boundary was placed according to the visual extent of surface artefacts

Type of Site

This place is considered to satisfy the following DAA site type(s):

- ☐ Burial ground set aside for Aboriginal burials by tradition, by use or is considered as a reserve
- ☐ Rock art (cave or rock drawings, paintings, stencils)
- ☐ Rock art (engravings)
- ☐ Stone Structures or arranged stones (culturally modified stones)
- ☐ Carved Trees (culturally modified)
- ☐ Storage place where Aboriginal objects have been traditionally stores, are currently stored or will be stored in future
- ☐ Sacred site which is in its entirety is devoted to religious use only, where ancestors or spirit beings reside or where central figures in important spiritual events resides or where events occurred
- ☐ Ritual or established ceremonial site where Aboriginal people communicate with or undertake practices in relation to sacred beliefs
- ☒ Place that is of historical, anthropological, archaeological or ethnographic interest and should be preserved because of its importance and significance to the cultural heritage of the State
- ☒ Places of importance and significance where objects, natural or artificial, used for, or made or adapted for use for, any purpose connected with the traditional cultural life of Aboriginal people, past or present have been left.

Description of the Place, Importance & Significance, Site Condition, Culturally Sensitive Information

Basic Description

NorthLink 14-02 is an artefact scatter that lies on the western side of the NorthLinkWA survey corridor. Most (91.9%) of it is outside the survey corridor, with the rest intruding up to 17 m within the survey corridor. Most, if not all, of the site should be protected from the proposed works.

NorthLink 14-02 is close to the Gngangara Pine Plantations on a flat plain west of a small swamp. The area is populated with paperbark trees, eucalypts and the occasional introduced pine tree. The understorey is consistent with that of wetlands, consisting of native and introduced grasses and sedges.

Being close to the Gngangara Pines, the immediate area is subject to offroad recreational vehicle use and the site is therefore intersected by numerous tracks. Some are particularly incised into the ground, suggesting intense use.

The vehicle tracks do however provide high ground surface visibility, which is estimated at 80%.

NorthLink 14-02 measures 97 m north-south, 100 m east-west and covers an area of approximately 4,426 m². Artefacts are concentrated to the north with lower densities to the south. Four sample squares were placed to sample artefact types and distribution. Squares 1, 2 and 4 measured 5 m x 5 m with Square 3 measuring 10 m x 10 m, with the latter placed to sample the main artefact concentration. The artefact population is estimated at 100 pieces with 30 artefacts recorded in the sampled assemblage. Artefact densities varied from 0.08/ m² in Square 2, to 0.2/m² in Squares 3 and 4.

Artefact types include complete flakes (n= 7; 23.3%), transverse flake fragments (n=5; 16.7%), longitudinal flake fragments (n= 3; 10%) and debris (n= 15; 50%). No cores were identified. All sampled complete flakes were small, ranging between 6 mm and 14 mm.

Recorded artefacts were predominantly manufactured from quartz (n=29) with a single silcrete flake identified in Square 4. In addition, a piece of fossiliferous debris was identified outside the sampled areas. All artefacts are the product of the second stage of core reduction. While the close association of complete flakes, longitudinal flake fragments and debris suggests that these pieces may have been knapped on site, no discrete reduction area was identified.

The close association of the artefacts suggest that the place (as defined by the boundary coordinates listed above) is the product of stone reduction behaviour.

Site Integrity

The site has been disturbed by numerous and well used vehicle tracks. Field observations suggest that the current artefact distribution may be in part a product of vehicle disturbance.

Assessment of Archaeological Site Significance

NorthLink 14-02 was recorded using Site Identification methods. The archaeological importance and significance of the site is considered with respect to this site's applicability under Section 5(c) of the AHA. These are generally determined by rarity, representativeness and the potential to address research questions, although other factors such as integrity may influence this decision. These are discussed below.

The desktop study of the project area by Coldrick, Hovingh and McDonald (2014) suggests that low density artefact scatters similar to NorthLink 14-02 predominate the currently known albeit limited archaeological record. Many have either moderate or poor integrity and in most instances have not been able to be relocated following the original recordings owing to archaeological collection practices in the 1970s and development (see for example (2014: 18 DAA Site ID 3618 'Whitemans Cutting'). Most of these places are small or sparse in density with quartz artefacts noted in all sites. Only two sites within the corridor reportedly encompass fossiliferous chert, suggesting that this site is rare on a local scale.

NorthLink 14-02 represents only one of two newly-identified sites identified across the 44 km NorthLinkWA survey corridor. Similarly, only one of 15 previously recorded sites (DAA Place ID 21994) was relocated during the survey. As such, relatively intact sites such as NorthLink 14-02 containing fossiliferous chert are not currently well represented in the extant archaeological record.

With reference to Table 3, which lists relevant regional research questions, NorthLink 14-02 has potential to address the following research questions:

- i) What was the pattern and intensity of occupation of the Swan Coastal Plain and what does this suggest about sites in the different geomorphic zones (after Anderson 1984; Hallam 1987; Bowdler, Strawbridge et al. 1991)?
- ii) Why is the recorded number of sites within the Bassendean Sands formation higher compared to other zones? And what does this indicate about demographic changes, mobility and land use patterns over time (Bowdler, Strawbridge et al. 1991)?
- iii) What is the spatial distribution and nature of fossiliferous chert artefacts (Ferguson 1980; Glover and Lee 1983)?

As parts of the area have been disturbed, the potential for stone reduction analysis is limited. The lack of visible stratified soil horizons in exposed profiles also suggest the site has limited potential to address research questions about the antiquity or changing nature of Aboriginal occupation. It is possible that undisturbed areas may provide clearer archaeological evidence that may have research potential.

Similarly NorthLink 14-02 is considered to have archaeological significance for its ability to address the pattern and nature of Aboriginal occupation of this portion of the Swan Coastal Plain. Furthermore the presence of a fossiliferous chert piece is rare on the local scale and could potentially contribute to studies about the timing and mobilisation of Aboriginal people in the Perth area. While some parts of the site have been subjected to disturbance, it is likely that intact areas within the place (as defined by the boundary coordinates above) may still be able to address these concerns.

NorthLink 14-02 is therefore considered to have archaeological significance in relation to the above factors and therefore should be protected under Section 5(c) of the AHA.

Further, the artefacts are considered to be the product of Aboriginal traditional life (as per section 5(a) of the AHA) as the flaked stone material bears manmade fracture patterns that typify Aboriginal stone artefact archaeological assemblages. The reader is directed to Holdaway and Stern (2011) for more detailed information. Their importance is as discussed above and therefore NorthLink 14-02 may be considered an Aboriginal Site under Section 5(a) of the AHA.

Other stakeholders such as native title claimants, other communities or interest groups may attribute other values to the site. These should be considered in addition to the archaeological significance discussed above.

Management Considerations

A significant proportion (91.9%) of NorthLink 14-02 is immediately outside the survey corridor and is not likely to be disturbed as part of the NorthLinkWA project. The area within the corridor should be avoided and as such, Main Roads Western Australia (MRWA) should ensure this portion of the site is protected during the proposed works. It is therefore **recommended** in the first instance that the site be protected from any further development.

Should the land on which the site is located be required, it is **recommended** that MRWA consults with the Noongar community and lodges a Notice under Section 18 of the *Aboriginal Heritage Act 1972* seeking consent to use the land on which this site is located.

Should ground disturbance take place nearby, it is **recommended** that monitoring take place by trained members of the local Noongar community and/or archaeologists during initial ground clearance to ensure that the site is not impacted by the proposed works.

Conclusion & Recommendations

In summary, NorthLink 14-02 is a small artefact scatter that was likely used on a small number of occasions. The objects within the place are considered to be the product of Aboriginal traditional cultural practices as described above. Its archaeological significance lies in its contribution to the current limited archaeological record in this area including the presence of a fossiliferous chert piece (which is moderately uncommon on the local scale) and its ability to contribute to regional discussions about Aboriginal land-use patterns on the Swan Coastal Plain. As a consequence, NorthLink 14-02 may be an Aboriginal site under Sections 5(a) and 5 (c) of the *Aboriginal Heritage Act 1972*.










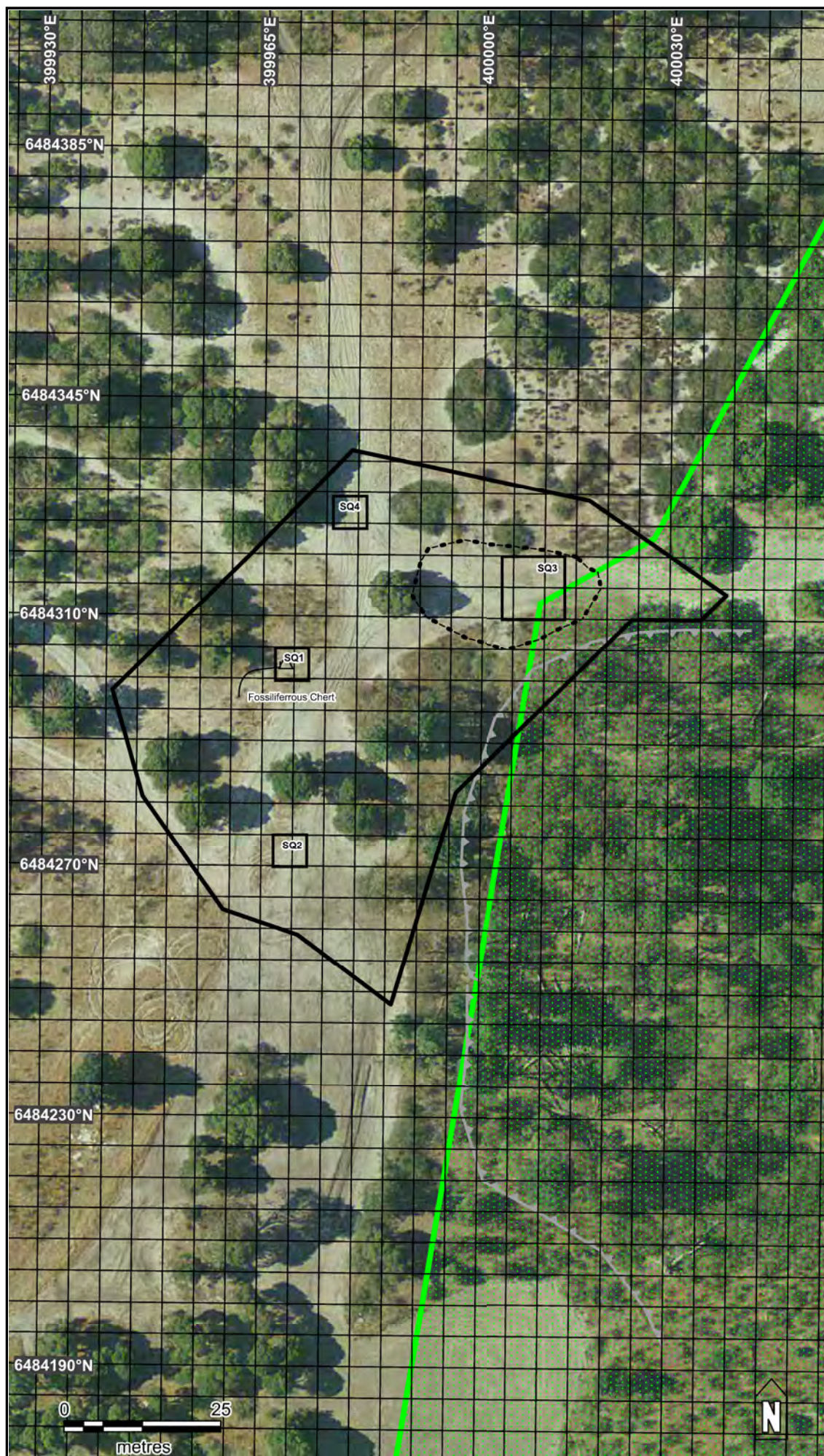
SNAPPY GUM
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Site Plan

NORTHLINK14-02

LEGEND

-  Artefact
-  Artefact Concentrations
-  Slopes (Arrows point down)
-  Grindstones
-  Mullers
-  Boundary
-  Project Area



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Photo 9: View to north with Kellie Cue.



Photo 10 (L): View Square 3 artefacts in situ



Photo 11 (R): View to west showing vehicle tracks



Photo 12 (L): View fossiliferous chert debris



Photo 13 (R): View quartz complete flake

Number	Site No.	Sample Square	Sample Size	Easting	Northing	Artefact Type	Lithology	Platform Type	No. Platforms (Cores)	No. Scars	% Unmodified Exterior	Cortex Type	Parallel Axis	No. Retouched Edges	Total Length of Retouch (mm)	Overhang Removal	Comments
1	Northlink14-02	1	0	039997	648428	Debris	Quartz	0	0	0	0	0	0	0	0		
2	Northlink14-02	1	0	039997	648429	Debris	Quartz	0	0	0	0	0	0	0	0		
3	Northlink14-02	1	0	039997	648429	Debris	Chert	0	0	0	0	0	0	0	0		
4	Northlink14-02	2	0	039996	648427	Debris	Quartz	0	0	0	0	0	0	0	0		
5	Northlink14-02	2	0	039997	648427	Complete Flake	Quartz	Flat	0	2	0	0	0	0	0		
6	Northlink14-02	3	0	040000	648431	Left Longitudinal Fragment	Quartz	Focussed	0	1	0	0	0	0	0		
7	Northlink14-02	3	0	040000	648431	Proximal Flake Fragment	Quartz	Crushed	0	1	0	0	0	0	0		
8	Northlink14-02	3	0	040000	648431	Left Longitudinal Fragment	Quartz	Flat	0	0	0	0	0	0	0		
9	Northlink14-02	3	0	040000	648431	Complete Flake	Quartz	Flat	0	1	0	0	0	0	0		
10	Northlink14-02	3	0	040000	648431	Complete Flake	Quartz	Flat	0	1	0	0	0	0	0		
11	Northlink14-02	3	0	040000	648431	Debris	Quartz	0	0	0	0	0	0	0	0		
12	Northlink14-02	3	0	040000	648431	Complete Flake	Quartz	Flat	0	2	0	0	0	0	0		
13	Northlink14-02	3	0	040000	648431	Right Longitudinal Fragment	Quartz	Flat	0	0	0	0	0	0	0		
14	Northlink14-02	3	0	040000	648431	Debris	Quartz	0	0	0	0	0	0	0	0		
15	Northlink14-02	3	0	040000	648431	Complete Flake	Quartz	Faceted	0	0	0	0	0	0	0		
16	Northlink14-02	3	0	040000	648431	Debris	Quartz	0	0	0	0	0	0	0	0		
17	Northlink14-02	3	0	040000	648431	Debris	Quartz	0	0	0	0	0	0	0	0		
18	Northlink14-02	3	0	040000	648431	Debris	Quartz	0	0	0	0	0	0	0	0		
19	Northlink14-02	3	0	040000	648431	Debris	Quartz	0	0	0	0	0	0	0	0		
20	Northlink14-02	3	0	040000	648431	Debris	Quartz	0	0	0	0	0	0	0	0		
21	Northlink14-02	3	0	040000	648432	Proximal Flake Fragment	Quartz	Faceted	0	1	0	0	0	0	0		Crystal Quartz
22	Northlink14-02	3	0	040001	648431	Proximal Flake Fragment	Quartz	Flat	0	0	0	0	0	0	0		
23	Northlink14-02	3	0	040001	648431	Debris	Quartz	0	0	0	0	0	0	0	0		
24	Northlink14-02	4	0	039998	648433	Complete Flake	Quartz	Flat	0	1	0	0	0	0	0		
25	Northlink14-02	4	0	039998	648433	Debris	Quartz	0	0	0	0	0	0	0	0		
26	Northlink14-02	4	0	039998	648433	Proximal Flake Fragment	Quartz	Faceted	0	1	0	0	0	0	0		
27	Northlink14-02	4	0	039998	648433	Debris	Quartz	0	0	0	0	0	0	0	0		
28	Northlink14-02	4	0	039998	648433	Complete Flake	Silcrete	Flat	0	1	0	0	0	0	0		
29	Northlink14-02	3	0	040000	648432	Proximal Flake Fragment	Quartz	Faceted	0	1	0	0	0	0	0		
30	Northlink14-02	3	0	040000	648431	Debris	Quartz	0	0	0	0	0	0	0	0		