Survey report of an Archaeological and Ethnographic Assessment for the Proposed Project Horizon Optic Fibre Cable Installation - Section T09 and T10, Western Australia, with the Ngoonooru Wajarri Traditional Owners

Proponent: Vocus Fibre Pty. Ltd.

Authors: Adam Deane, Francisco Almeida, Katrina Thomas, Celine Mucke, Kristen Ellis, and Isabelle Waite

Date: 28 June 2023

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Native Title Party: Wajarri Yamaji Aboriginal Corporation RNTBC

Proponent: Vocus Fibre Pty. Ltd. **ABN**: 40 150 260 156

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Cover image: Landscape Image of Part of Study Area

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Archaeological Excavations Pty. Ltd. wishes to acknowledge and pay respect to the Ngoonooru Wajarri people, who are the Traditional Owners of the lands and waters described in this report.

Furthermore, Archaeological Excavations Pty. Ltd. acknowledge and thank the following organisations and individuals for their time, knowledge and contributions towards this Archaeological and Ethnographic Survey Report;

- Kevin Walley, Stephen Compton, Joshua Layton, Matthew Berg, Trevor Layton, Shona Dalgety, and Marley Fraser

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Coordinate Capture

The authors advise that all coordinates quoted in this document were obtained with a Garmin RINO 750. These units depend on external conditions and afford an optimal spatial accuracy of ± 3 m.

Executive Summary

Vocus Fibre Pty. Ltd. commissioned Archaeological Excavations Pty. Ltd. to undertake an Aboriginal archaeological and ethnographic cultural heritage survey for the Proposed Project Horizon Section T09 and T10 alignment for the installation of an optic fibre cable. Vocus Fibre Pty. Ltd. and the Ngoonooru Wajarri Land Committee have agreed to the survey, and any subsequent recommendations will be undertaken per best practice in Aboriginal cultural heritage management.. As Vocus Fibre Pty. Ltd. wish to avoid impacting Aboriginal cultural heritage during their proposed works, the survey has been undertaken to assess the presence and absence of Aboriginal cultural heritage within the proposed T09 AND T10 alignment with the intent of formulating avoidance measures. As such, it was agreed the survey would not include detail to register Aboriginal Sites per the *Aboriginal Heritage Act 1972* and Department of Planning, Lands and Heritage (DPLH), but rather the general nature and location of Aboriginal cultural heritage within the proposed alignment.

The Project Horizon Section T09 and T10 proposed alignment is a 30-metre linear corridor that extends approximately 92km from the northern boundary of the Meekatharra township towards Peak Hill. The proposed alignment is situated within the Great Northern Highway road reserve. The location of the survey area falls within the Wajarri Yamatji Part A determination area of the Wajarri Yamatji Native Title Party. Specifically, the survey area is located within the traditional boundaries of the Ngoonooru Wajarri Land Group of the Wajarri Yamatji Native Title Party. The Wajarri Yamaji Aboriginal Corporation (WYAC) is the registered native title body corporate for the Ngoonooru people. In accordance with the *Native Title Act 1993 (Cth)* and the WYAC rule book, the Ngoonooru Wajarri Land Committee have appointed Archaeological Excavations Pty. Ltd. as their Heritage Service Provider (HSP), and the survey has been undertaken in consultation with Ngoonooru Heritage Officers.

A search of the DPLH Aboriginal Heritage Information System (AHIS) identified twelve (12) registered Aboriginal sites in proximity to the T09 and T10 survey area. These comprise nine (9) artefact scatters Thirty Two Mile Well (Site ID: 6196), Peak Hill Turn Off (Site ID: 6197), Government well (Site ID: 6195), No.1 Bore (Site ID: 6544), Andy Well 01-12 (Site ID: 31786), Andy Well 02-12 (Site ID: 31787), Andy Well 03-12 (Site ID: 31788), Andy Well 05-12 (Site ID: 31790), Andy Well 06-12 (Site ID: 31791). Two (2) artefact scatters and quarries: Mountain Devil 04-12 (Site ID: 31789) and Andy Well 07-12 (Site ID: 31792), in addition to one (1) isolated find, Andy Well Isolated Finds (Site ID: 31793). The registered artefact scatter at Thirty Two Mile Well can be avoided if the alignment follows through the middle of the survey corridor; however, there is a high density of Aboriginal cultural heritage material outside the registered site. The assessment has determined that the additional nine (9) Registered Sites and two (2) Other Heritage Places are located outside the proposed alignment and will not be

impacted by the proposed works. There is also a high density of registered sites within the non-native title area around Meekatharra township that the proposed alignment will affect.

An archaeological and ethnographic survey was undertaken over twelve (12) days between 28 March and 5 May 2023. The survey was conducted by Zachary Buckley (Archaeological Assistant, Archaeological Excavations), Adam Deane (Director, Archaeological Excavations), Francisco Almeida (Archaeologist, Archaeological Excavations), Isabelle Waite (Archaeologist, Archaeological Excavations), Ashleigh Baker (Archaeologist, Archaeological Excavations), Martin Durkan (Archaeological Assistant, Archaeological Excavations), Kevin Walley (Ngoonooru Elder and Ngoonooru Senior Heritage Officer), Stephen Compton (Ngoonooru Senior Heritage Officer), Joshua Layton (Ngoonooru Heritage Officer), Matthew Berg (Ngoonooru Heritage Officer), Trevor Layton (Ngoonooru Heritage Officer), Shona Walley (Ngoonooru Heritage Officer) and Marley Fraser (Ngoonooru Heritage Officer).

The survey identified no ethnographic sites within the proposed alignment area of T09 and T10. The survey did identify previously unrecorded artefact scatters, quarries, culturally modified scarred trees, native bush tucker, medicinal trees, and isolated/low-density spread of a variety of surface stone artefacts along the proposed alignment. In total the survey identified 28 artefact scatters, 7 quarries, 18 culturally modified trees and low density spread of stone artefacts.

Recommendations to avoid harm have been developed with Ngoonooru Heritage Officers and include avoiding newly identified artefact scatters by utilising alternate construction techniques of directionally drilling beneath the sites to avoid impact. It is recommended a program of salvage and relocation of surface stone artefacts that have not been assessed as being part of an Aboriginal Site under Section 5 of the *Aboriginal Heritage Act 1972* and directions of the Aboriginal Cultural Materials Committee if harm cannot be avoided. Avoidance is also recommended for the culturally modified trees identified within the proposed alignment.

For registered sites Thirty Two Mile Well (Site ID: 6196) and Government Well (Site ID: 6195), and the newly identified sites the following recommendations are made if avoidance of harm is not possible;

If the project falls within the transitional process under the newly implemented ACHA, then an application for a Section 18 is required in consultation with the Ngoonooru Land Committee, subject to agreeable management impact and management conditions. Alternatively, as the proposed project is likely a tier 3 activity under the newly implemented ACHA, a cultural heritage management plan may be prepared in consultation with the Ngoonooru Wajarri Land Committee for the necessary approvals to impact Aboriginal cultural heritage sites/places within the proposed alignment.

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1. Introduction

Archaeological Excavations Pty Ltd was commissioned by Vocus Fibre Pty Ltd (Vocus) to undertake an archaeological and ethnographic Aboriginal cultural heritage survey for Sections T09 and T10 of the proposed Project Horizon optic fibre cable alignment (Map 1). The purpose of this assessment is to identify whether the proposed cable installation will impact Aboriginal cultural heritage sites and/or objects within the survey area and to provide advice on any practical measures that may be undertaken to avoid or mitigate potential harm to Aboriginal sites or Aboriginal cultural heritage within the survey area.

The Ngoonooru people are the Traditional Owners of the survey area subject of this report and have been determined by the Federal Court of Australia as the common law holders of native title (see 1.4). The Ngoonooru Native Title Holders have participated and been consulted throughout this assessment.

1.1 Proponent

Name: Vocus Fibre Pty Ltd

ABN: 40 150 260 156

Address: 452 Flinders Street, Melbourne, Victoria 3000

1.2 Authors

This report has been authored by:

Katrina Thomas

Katrina has over 15 years of experience working in Aboriginal cultural heritage. She is a qualified Archaeologist and Heritage Advisor, having completed a Bachelor of Archaeology with Honours (First Class) from Flinders University, South Australia (2008). She has had extensive experience working in Aboriginal cultural heritage in South Australia, Victoria and Western Australia, working in roles with State Government, Heritage consultancies and Traditional Owner organisations in both Victoria and Western Australia.

Kristen Ellis

Kristen is a Heritage Advisor, Archaeologist, Project Manager, and GIS specialist with a Bachelor of Arts majoring in Ancient Cultures from Monash University (2018) and a Master of Professional Archaeology from La Trobe University (2022), through which she authored a thesis on submerged Aboriginal cultural heritage. Kristen has several years of experience working with RAPs across Victoria, undertaking Aboriginal heritage assessments in Western Australia, and has experience supervising internationally on archaeological excavations.

Celine Mucke

Celine has an undergraduate degree from Te Herenga Waka, Victoria University of Wellington (2021) majoring in Art History and History. Through this her undergraduate studies looked at decolonisation in heritage institutions, art and encounter, and art practice in Australasia. Through her lived experience growing up in New Zealand and academic pursuits she hopes to advocate for Traditional Owners management of their cultural heritage. She is also currently studying a Masters of Cultural Material Conservation at the University of Melbourne (2024) and is focusing her studies on the preservation and prioritisation of Traditional knowledge systems.

Isabelle Waite

Isabelle has an Undergraduate degree from the University of Worcester, United Kingdom (2022) with a Bachelor of Art (Hons) in Archaeology and Heritage Studies. This degree focused on prehistoric Archaeology, and she completed her Honours Thesis on using Archaeothanatology to infer burial containers in cemetery sites and hopes to apply this methodology to Australian sites. She is keenly interested in the tangible and intangible archaeology of Western Australia and hopes to complete her Masters in landscape archaeology in this field in Australia.

1.3 Location of the Survey Area

The T09 and T10 alignment survey area comprises a linear corridor that is 30 metres in width and approximately 92km in length (see Map 1). The survey area extends north from the northern boundary of Meekatharra Township towards Peak Hill and is located within the Great Northern Highway road reserve.

1.4 Native Title Party

The location of the survey area falls within the Wajarri Yamatji Part A WCD2017/007 determination area of the Wajarri Yamatji Native Title Party. The Wajarri Yamaji Aboriginal Corporation (WYAC) is an incorporated body under the Corporations (Aboriginal and Torres Strait Islander) Act 2006 (Cth). It is the Registered Native Title Body Corporate (RTNBC) concerning the proposed heritage survey area of 30 metres by approximately -92 km in length.

The Wajarri Yamatji Native Title Party comprises four distinct and individual Wajarri Traditional Owner land groups. The survey area for this report is located wholly within the Ngoonooru Land Group of the Wajarri Yamatji Native Title Party. Under the Native Title Act 1993 and the WYAC rule book, the Ngoonooru Wajarri Land Committee hold responsibility for decisions relating to Native title and heritage. The Ngoonooru Land Committee has appointed Archaeological Excavations Pty Ltd as the Heritage Service Provider (HSP) for the Ngoonooru traditional lands and waters, and the survey has been undertaken in consultation with Ngoonooru Heritage Officers. Decisions relating to cultural heritage within the survey area are to be made by the Ngoonooru Land Committee.

1.5 Legislative Context

Aboriginal Heritage Act (1972)

The *Aboriginal Heritage Act* (1972) protects Aboriginal sites in Western Australia, regardless of whether they are registered with the Department of Planning, Lands and Heritage (DPLH). DPLH is the body that currently administers the *Aboriginal Heritage Act* (1972).

An Aboriginal site is defined in Section 5 of the *Aboriginal Heritage Act* (1972) as -

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

It is an offence under Section 17 of the *Aboriginal Heritage Act* (1972) for a person to:

> (a*) Excavate, destroy, damage, conceal or in any way alter any Aboriginal sites; or*
>
> *(b) In any way, alter, damage, remove, destroy, conceal, or deal with in a manner not sanctioned by relevant customs or assume the possession, custody, or control of any artefact on or under an Aboriginal site.*

If an activity is likely to breach Section 17, consent can be applied under Section 18 of the *Aboriginal Heritage Act* (1972). An application for consent to disturb an Aboriginal site must be made to the Aboriginal Cultural Material Committee (ACMC) with the Section 18 form available from the DPLH website. The ACMC will consider the application and provide recommendations to the Minister for Aboriginal Affairs (WA) on whether the consent should be granted and detail any conditions that should apply. It is recommended that consultation be undertaken with the Native Title Party and informed consent be sought prior to applying for consent to disturb an Aboriginal site under Section 18 of the AHA.

It should be noted the AHA is to be succeeded by the new Aboriginal Cultural Heritage Act 2021 (ACHA). The implementation of the ACHA is expected during 2023. It is to provide a modern-day framework for the greater protection and management of Aboriginal cultural heritage across Western Australia. The process for managing Aboriginal cultural heritage is expected to shift significantly under

the ACHA. Whilst the ACHA Regulations are yet to be released, the consent to disturb an Aboriginal site as currently regulated by Section 18 of the AHA will cease. The new legislative framework is expected to introduce a system requiring approved Cultural Heritage Permits and Aboriginal Cultural Heritage Management Plans in place of the current Section 18 consent process.

Native Title Act 1993 (Cth)

The Commonwealth Native Title Act 1993 (NTA) provides a national system for recognising and protecting Aboriginal and Torres Strait Islander people's traditional rights and interests, including the right to carry out activities such as fishing, hunting, gathering and undertaking cultural practices. Determinations made by the Federal Court recognise the continuing native title rights and interests of Aboriginal and Torres Strait Islander Native Title applicants. In some circumstances, the NTA may be used to protect places and areas that are important in accordance with traditional laws and customs. Protection may be afforded to Native Title Holders through legal means, such as a court injunction to prevent an activity that would cause harm to an important place or area. Such action may be undertaken in addition to or absence of other State and Commonwealth cultural heritage legislations.

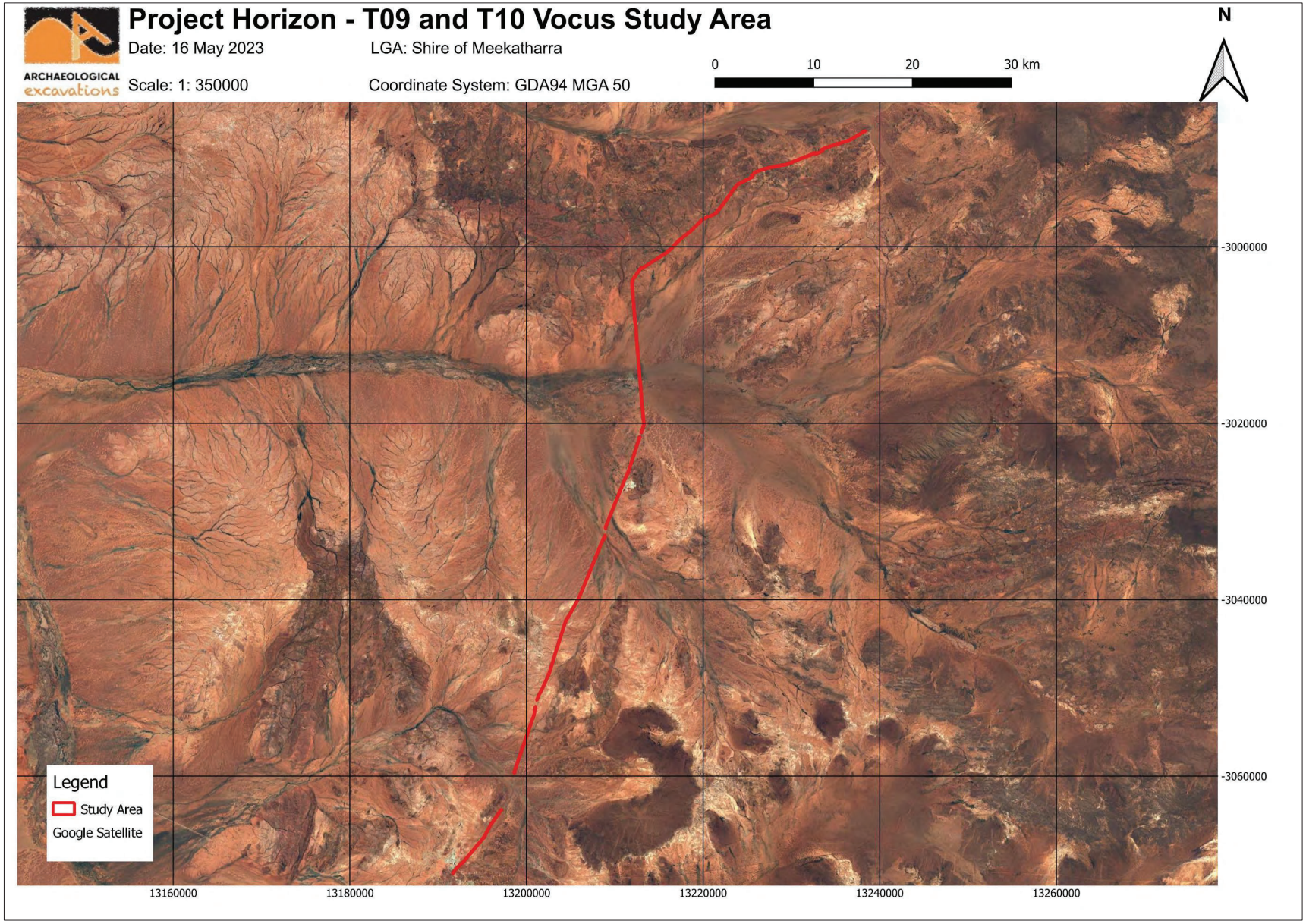
Aboriginal and Torres Strait Islander Heritage Protection Act 1984 (Cth)

The *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (ATSIHP) provides a mechanism for the Commonwealth Government to intervene in certain circumstances to prevent harm to and protect areas and artefacts of particular significance to Aboriginal and Torres Strait Islander people. The ATSIHP allows a process for the Minister for the Environment and Water to issue a declaration to 'protect an area, artefact or class of artefacts from a threat of injury or desecration'. An application under the ATSIHP can be made by Aboriginal and Torres Strait Islander people or their representative for protection over an area or artefacts that are significant per tradition and customs.

Discovery of Aboriginal Ancestral Remains

Aboriginal Ancestral remains are protected under the AHA, ATSIHP, and *Coroners Act 1996.* In the event of the discovery of Aboriginal Ancestral human remains, the following persons must be notified;

- The Police or Coroner, in accordance with Section 17 of the *Coroners Act 1996,*
- The State Register of Indigenous Sites in accordance with Section 15 of the *Aboriginal Heritage Act 1972*, and
- The Federal Minister for Aboriginal Affairs, in accordance with Section 20 of the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984 (Cth).*



Map 1 - Project Horizon, Section T09 and T10 Alignment.

2. Project Description

Vocus Fibre Pty. Ltd. proposes to install a fibre optic cable through Ngoonooru Wajarri lands and waters as part of Project Horizon. The fibre optic cable will be installed by ploughing a slot into the ground surface and placing the cable in the slot. Construction methods may vary where required, including laying the cable by trenching, directional drilling, or any other engineering means that Vocus Fibre Pty. Ltd. may deploy.

3. Desktop Assessment

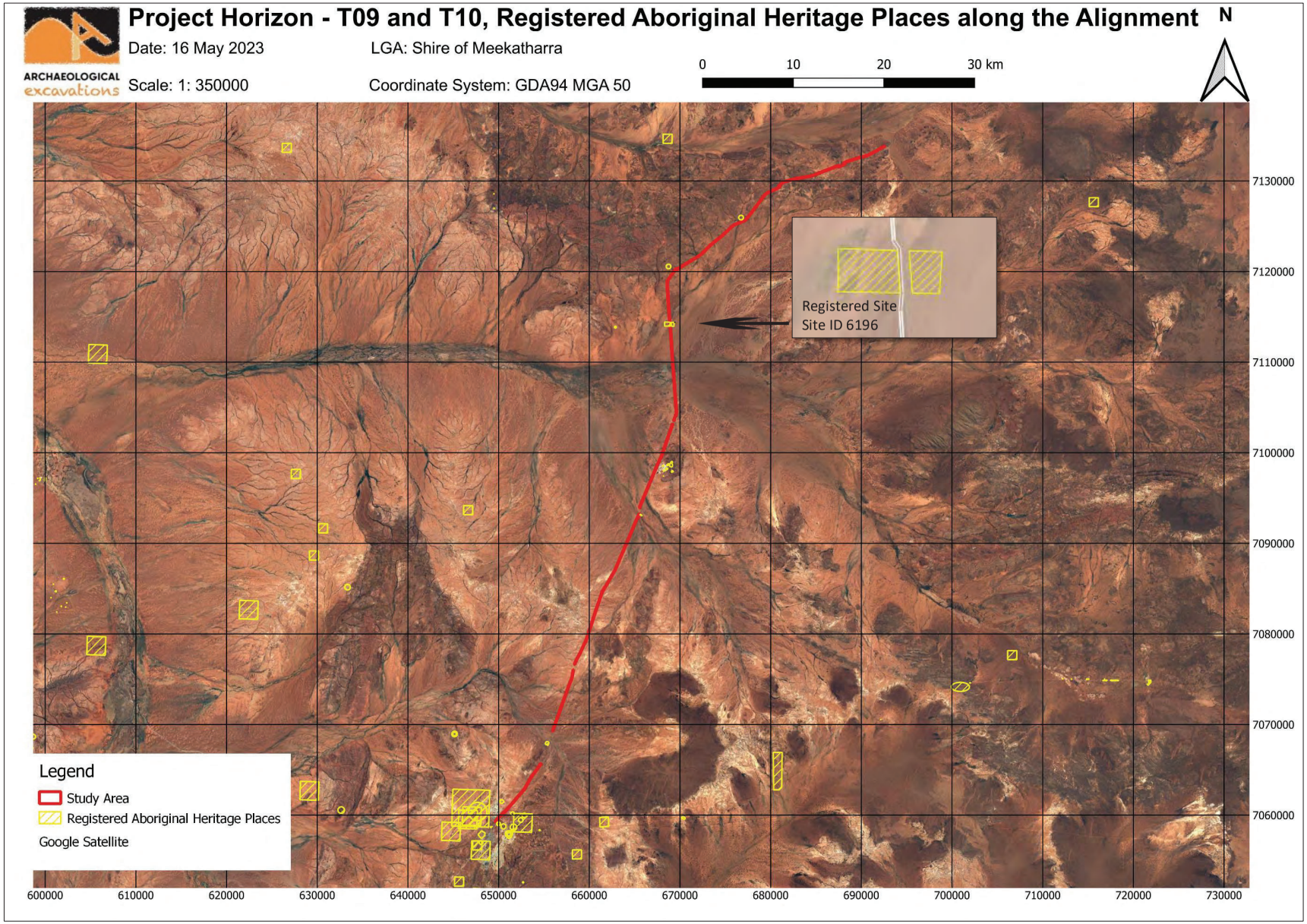
3.1 Search of the Aboriginal Heritage Information System (AHIS)

A search of AHIS was undertaken on 17 March 2023 by Katrina Thomas (Archaeologist, Archaeological Excavations Pty. Ltd.). The investigation was conducted to identify registered Aboriginal sites, Other Heritage Places (OHPs), and previous surveys undertaken within and near the survey area. The search identified one (1) registered Aboriginal site that intersects the survey area, with nine (9) additional registered sites and two (2) Other Heritage Places in close proximity (see Table 1 and Map 2).

Table 1 – AHIS results search of registered Aboriginal sites and Other Heritage Places in the survey area.

ID	Name	Status	Type	Boundary Restrictions	File and Gender Restrictions	GPS Coordinates
6196	Thirty Two Mile Well	Registered Site	Artefact Scatter	Yes	No Restrictions	668807mE 7114189mN Zone 50 [Reliable]
6197	Peak Hill Turn-Off	Registered Site	Artefact Scatter	No	No restrictions	668740mE 7120553mN Zone 50 [Unreliable]
6544	No.1 Bore	Lodged	Artefact scatter	Yes	No Restrictions	676740mE 7125953mN Zone 50 [Reliable

31786	Andy Well 01-12	Registered Site	Artefact Scatter	Yes	No Restrictions	668153mE 7098562mN Zone 50 [Reliable]
31787	Andy Well 02-12	Registered Site	Artefact Scatter	Yes	No Restrictions	668233mE 7098023mN Zone 50 [Reliable]
31788	Andy Well 03-12	Registered Site	Artefact Scatter	Yes	No Restrictions	668525mE 7098206mN Zone 50 [Reliable]
31790	Andy Well 05-12	Registered Site	Artefact Scatter	Yes	No Restrictions	668736mE 7098719mN Zone 50 [Reliable]
31791	Andy Well 06-12	Registered Site	Artefact Scatter	Yes	No Restrictions	668615mE 7098627mN Zone 50 [Reliable]
31789	Mountain Devil 04-12	Registered Site	Artefact Scatter, Quarry	Yes	No Restrictions	669037mE 7098698mN Zone 50 [Reliable]
31792	Andy Well 07-12	Registered Site	Artefact Scatter, Quarry	Yes	No Restrictions	669146mE 7097923mN Zone 50 [Reliable
31793	Andy Well Isolated Finds	Stored Data	Other: 58 Isolated Artefacts	Yes	No Restrictions	668199mE 7097427mN Zone 50 [Reliable]
6195	Government Well	Registered Site	Artefact Scatter	Yes	No Restrictions	665695mE 7093116mN Zone 50 [Reliable]



Map 2 - AHIS search results registered Aboriginal Sites and Other Heritage Places (OHPs).

3.2 Previous Aboriginal cultural heritage studies near the survey area

Limited archaeological research has been previously undertaken within the Upper Murchison Catchment area. Previous archaeological research has been limited primarily to assessing proposed impact works. No regional archaeological studies have been undertaken for the wider region. The oldest occupation dates recorded closest to the survey area include a rock shelter in the Weld Range dated c. 29,000 years BP – Yalibirri Mindi Rock shelter (Winton et al. 2016), and a date obtained from Walga Rock of c. 10,000 years BP (Bordes et al. 1983). Both these places are south of the current Survey Area.

The area greatly interested early colonial interests, resulting in the pillaging and looting of Aboriginal cultural and Traditional objects and Aboriginal Ancestral human remains. A notable collection relevant to the survey area was acquired by Alexander Morton at the Tasmanian Museum in 1907. This collection included Ancestral human remains and Traditional and cultural objects taken from Lake Annean and surrounding areas on Ngoonooru Country.

Previous Assessments relating to the Study Area

O'Connor, R. and Veth, P. 1984. Report of the survey for Aboriginal Sites in the Vicinity of DRCS Repeaters, Meekatharra – Mount Magnet Area.

A study was undertaken to identify sites in the vicinity of Meekatharra and Mount Magnet area for Telecom Australia's proposed construction of repeater stations for the Digital Radio Concentrator System. The study identified several significant mythological and ceremonial sites and included detailed post-contact historical connections to the area.

Muir, K. 1992. Fieldtrip in the North-Eastern Goldfields and East Gascoyne/Murchison, a restricted report prepared for the Department of Aboriginal Affairs.

A short report was prepared for the results of a field trip undertaken in 1991 that inspected locations in Murchison and surrounding areas. During the field trip, descriptions of the landscape and its connections to mythological stories and beliefs were noted. These landscape features included rock holes, rock shelters, quarries, mountain ranges, water catchments and caves. Whilst no sites were visited within the current survey area, a number of men's sites, engravings, rock art and campsites were identified, with a large amount of archaeological material being present.

Huxtable, L. And Greenfeld, P. 2014. Report of an Aboriginal Heritage Survey Of Strategic Materials Sources: Great Northern Highway: Shires of Meekatharra and Cue, Western Australia.

An ethnographic and archaeological survey was undertaken on behalf of Main Roads Western Australia for the location of pits. The study identified no ethnographic sites defined in accordance with s.5b, 5c, 39.2 and 39.3 of the AHA. The archaeological survey identified two artefact scatters and one quarry in the location of some of the proposed pits. The artefact scatters were determined to be 'remnants of stone tool flaking leftover from a small itinerant camp.' Avoidance was recommended to the quarry, and the artefact scatters and be retained in situ as evidence of the ancestor's occupation and for the education of generations to come.

WA, M.R., 2006. Wiluna-Meekatharra Passing Opportunity.

GHD Pty Ltd undertook an environmental assessment on behalf of Main Roads between Meekatharra and Wiluna in preparation for road works along a Section of the Goldfields Highway; the assessment identified three Artefact Scatters and one culturally modified scar tree.

3.3 Environmental Context

3.3.1 Geology and Hydrology

The survey area is within the Archaean granite-greenstone terrain of the Yilgarn Craton (DMIRS 2023). The Yilgarn Craton forms a large part of the Western Australian land mass and is believed to have formed approximately 3-2.5 billion years ago. The survey area is specifically situated within the Youanmi Terrane of the Craton. The area comprises complex geological processes and hill ranges separated by plains derived from colluvial and alluvial soil (Laws 1994).

The survey area is geographically located within the Upper Murchison River Catchment area, which forms part of the drainage basin of the Murchison River (see Figure 1). The catchment predominantly drains towards the Indian Ocean (Laws 1994). The proposed section T09 and T10 alignment affects tributaries of Garden Gully Creek and Yalgar and Murchison Rivers.

Colluvial and alluvial deposits are sediments from bedrock erosion and lateritised duricrust, which grade downslope to broad, gently sloping sheet wash plains (Laws 1994). Quaternary alluvial deposits (~2.8 million years ago to present) within the area consist of “predominantly a fine to coarse-grained quartz sand with layers and lenses of silt, conglomerate and clay” (Laws 1994), with sands being predominantly derived from river alluvium and the erosion of older rocks.

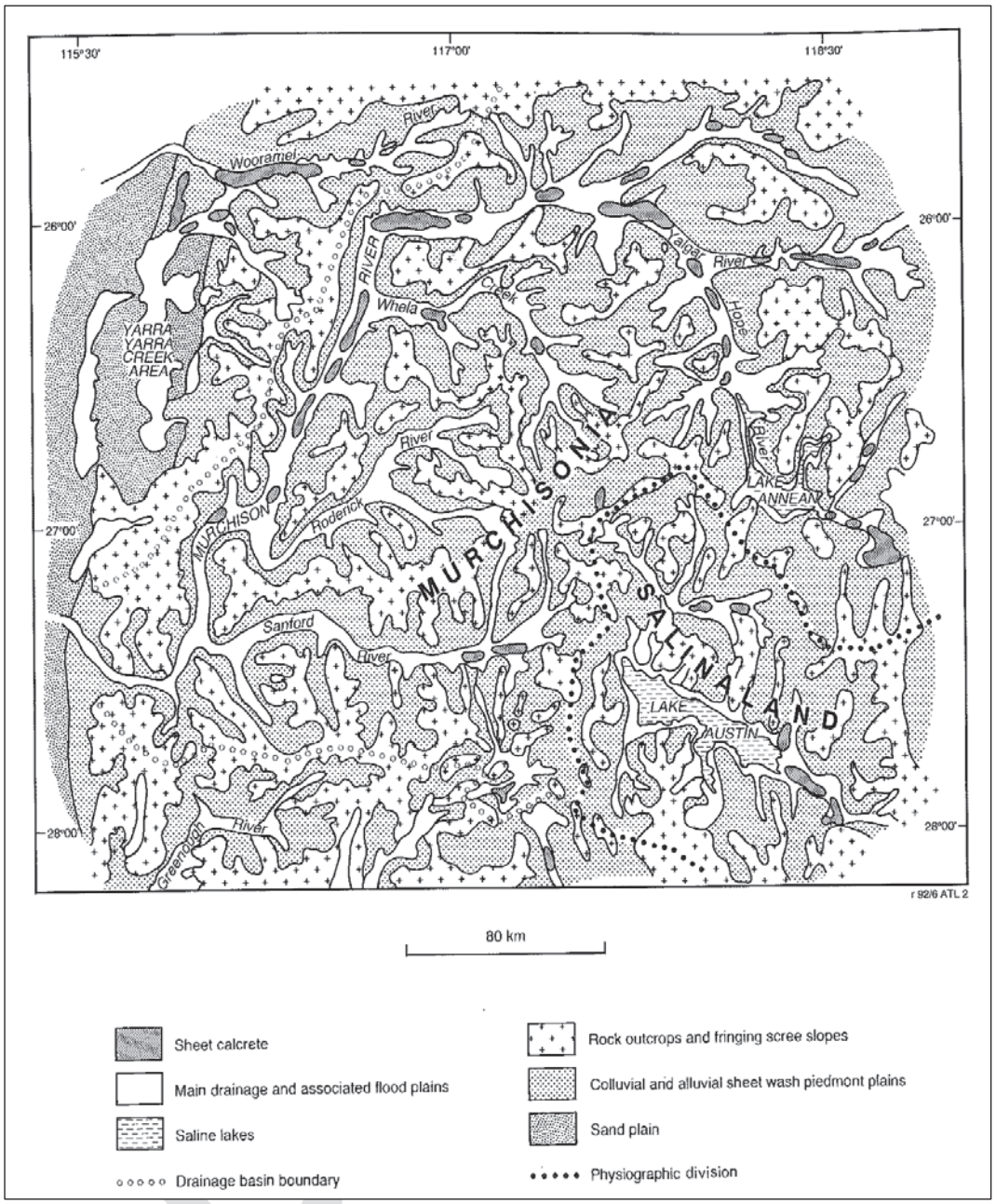


Figure 1 – Generalised Geology and Hydrology (Laws 1994:22).

3.3.2 Land Systems

The survey area is within several identifiable land systems: Wiluna, Belele, Cunyu, Sherwood, Glengarry, Violet, Jundee, Yandil, and BE8 Atlas Land Systems (see Map 3).

Table 2 – Land Systems of the survey area (DPIRD 2023).

Land System Name	Description	Land form
Wiluna Land System (Wil)	Low greenstone hills with occasional lateritic breakaways and broad stony slopes, lower saline stony plains and broad drainage tracts, supporting sparse mulga and other acacia shrublands with patches of halophytic shrubs.	Low hills; Acacia or eucalypt woodlands with a halophytic understorey
Belele System	Hardpan wash plains with acacia tall shrublands and low sandy banks supporting shrublands with wanderrie grasses.	Hardpan plains: mulga shrubland with understory shrubs and grassy banks
Cunyu System	Calcrete platforms, intervening drainage floors, channels, minor alluvial plains, supporting acacia shrublands, occasional casuarina woodlands, and minor halophytic shrublands.	Hardpan plains: flow zones and channels with non-halophytic shrublands and grasslands
Sherwood System	Breakaways, kaolinised foot slopes and extensive gently sloping plains on granite supporting mulga shrublands and minor halophytic shrublands.	Sloping plains: mulga shrubland and halophytic shrublands
Glengarry System	Sandstone plateaux, summits and hillslopes supporting mainly dense mulga and other acacia shrublands, spinifex, and numerous low shrubs.	Plateaux, summits, and hillslopes: acacia shrubland and low shrubs
Violet Land System (Vio)	Gently undulating gravelly plains on greenstone, laterite and hardpan, with low stony rises and minor saline plains, supporting groved mulga, bowgada shrublands, and occasionally chenopod shrublands.	Stony plains; Acacia shrublands and halophytic shrublands

Jundee Land System (Jun)	Hardpan plains with variable gravelly mantles and minor sandy banks supporting weakly groved mulga shrublands.	Wash plains on hardpan; Mulga shrublands
Yandil Land System (Ynd)	Flat hardpan wash plains with mantles of small pebbles and gravels, supporting groved mulga shrublands and occasional wanderrie grasses.	Wash plains on hardpan; Mulga shrublands
BE8 Atlas System	Extensive flat and gently sloping plains, which sometimes have a surface cover of gravels and on which red-brown hardpan frequently outcrops	Flat and gently sloping plains: gravel surface cover

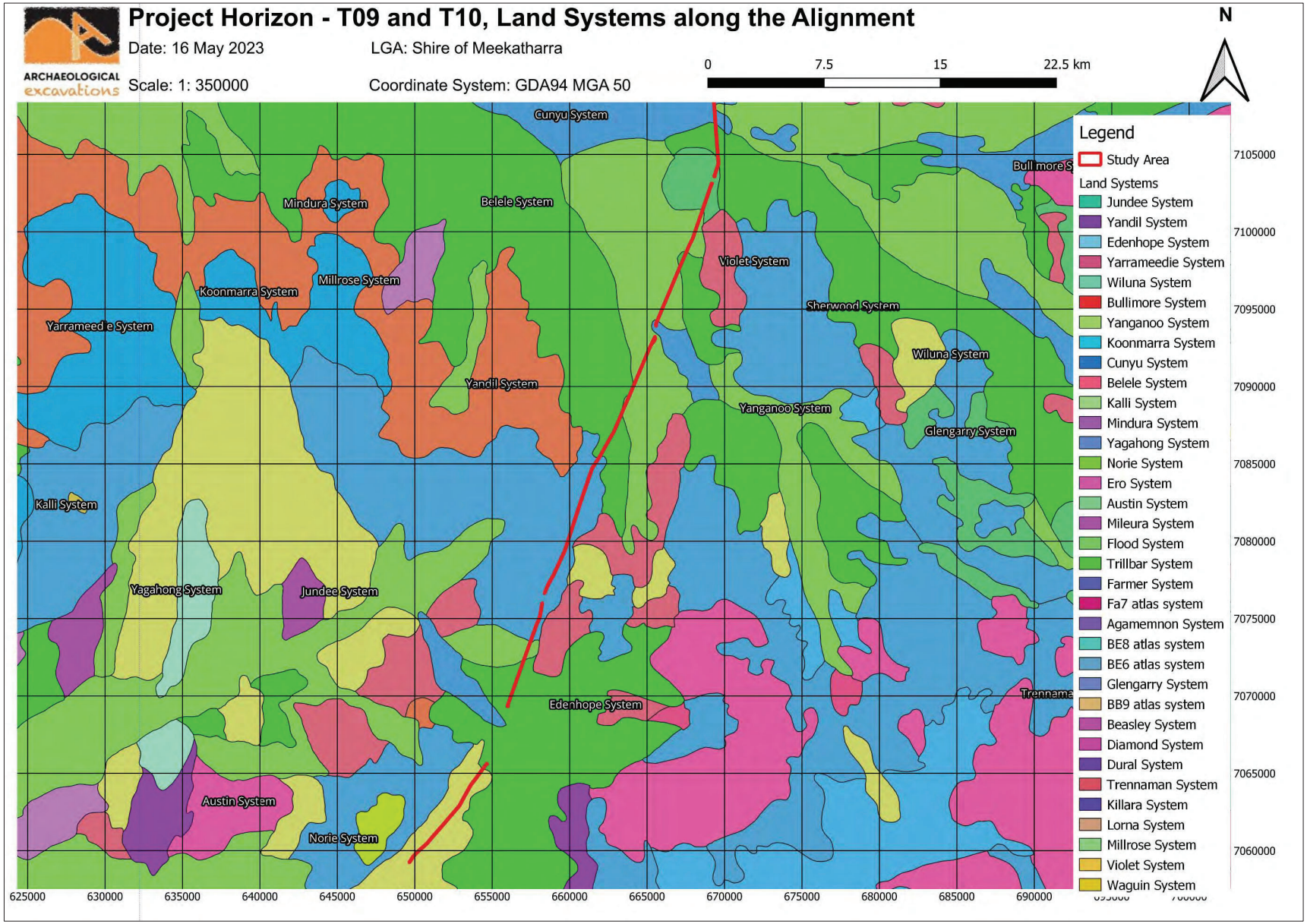
3.3.3 Climate

The climate within the Murchison Catchment is arid to semi-arid. Temperatures exceed 37 degrees Celsius, peaking between January and February. Winter months in the region are noticeably cooler, with an average temperature of 20 degrees Celsius and minimums reaching 10 degrees overnight, residing as low as 6 degrees Celsius further inland (BoM 2023).

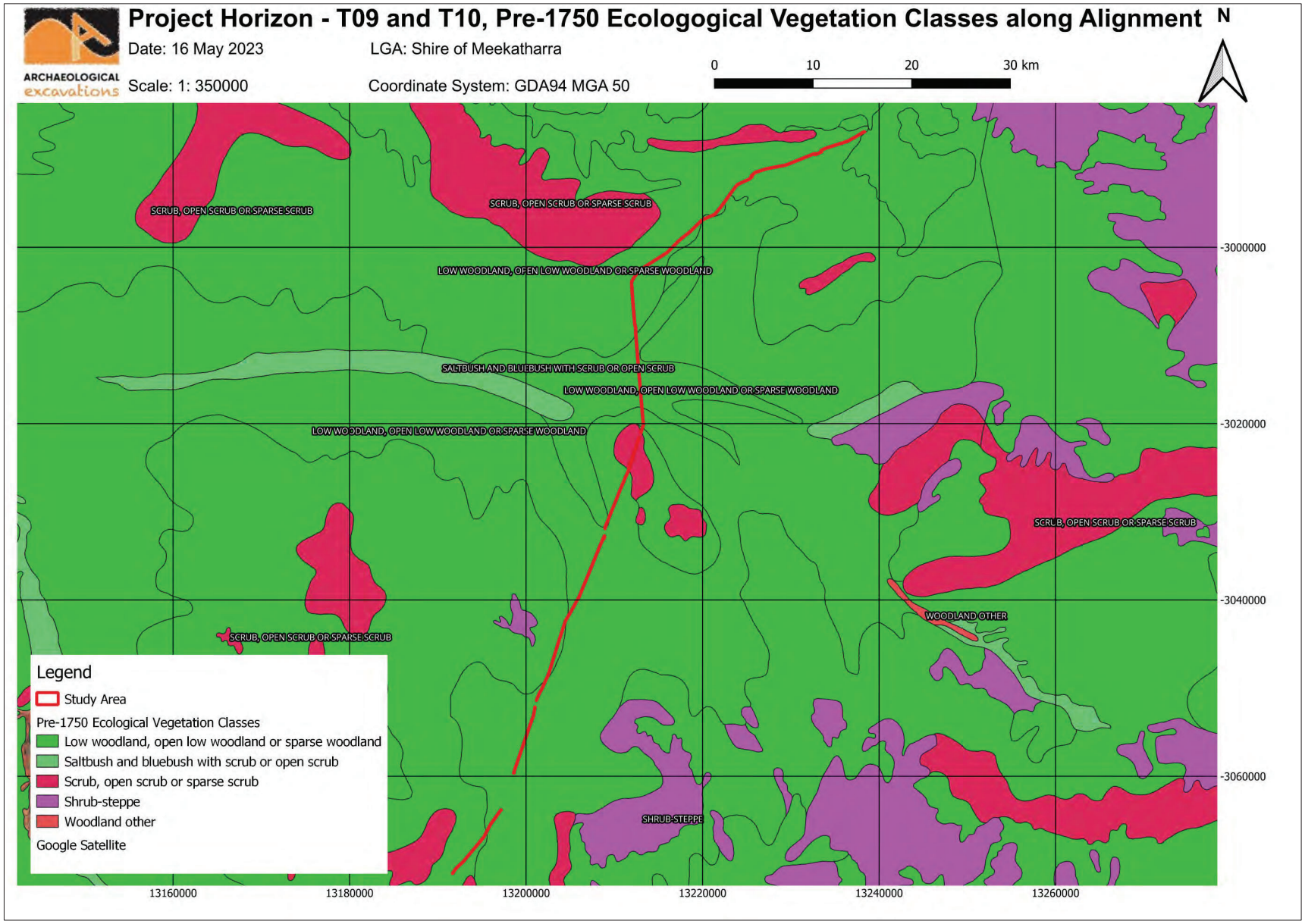
Annual rainfall within the region is typically between 190 – 250 mm between January and July. Rainfall variation is common within Murchison's central and northern zones, as low-pressure systems may occur along the coastline, followed by cyclones (BoM 2022; WA Natural Resource Management n.d.).

3.3.4 Flora and Fauna

The vegetation community of the Upper Murchison area is predominantly covered by low mulga woodlands (*Acacia aneura*) and shrublands. Understory communities include ephemeral plants and grasses. Hummock grasslands are associated with red sandplains, shrublands are associated with calcareous soils, and samphire (*Tecticornia spp.*) is related to saline alluvial soil deposits (Desmond et al. 2001). Salt Bush (*Atriplex amnicola)* is noted to be prominent within the floodplains of the Murchison Rivers (Barrett-Lennard & Norman 2009).



Map 3 - Land Systems related to survey area (DPIRD 2023).



Map 4 - Pre-European Vegetation Communities Related to the survey area.

3.4 Desktop Conclusions

The desktop assessment identified one (1) Registered Aboriginal site that possibly affects the proposed Project Horizon T09 and T10 alignment – Thirty Two Mile Well, Site ID 6196. An additional nine (9) Registered Aboriginal sites and two (2) Other Heritage Places in close proximity to the survey area. Previous Aboriginal heritage investigations near the survey area identified artefact scatters, quarries and isolated artefact sites in the wider area. It is considered likely the study area will contain artefact scatters and quarries.

4. Ethnographic Survey

This ethnographic assessment has been prepared at Vocus Fibre Pty. Ltd. request for the Proposed Optic Fibre installation for Project Horizon Sections T09 and T10. The study area is located within Ngoonooru Country. The study area comprises a linear corridor 30 metres wide and 92 kilometres long, extending from the northern boundary of the Meekatharra township north to Peak Hill.

4.1 Ethnographic and Historical Context

To Australia's Aboriginal peoples, Country is a 'culturally defined area of land associated with a particular, culturally distinct group of people, clan or nation'; 'Country can also refer to more than a physical place – it indicates cultural relationships and responsibilities associated with caring for the land' (Australians Together 2020, p.11). With Ancestral Law creating Ngoonooru Country and culture, the routes taken by Creator Ancestors mark the landscape, becoming responsible for language, social-cultural practices, flora and fauna, and water sources. The Creators formed a living relationship with genealogical ties, growing with them and forming kinship and obligation (Nicholls 2014). Modern-day Ngoonooru Country faces definitions by native title boundaries. Despite this, Ngoonooru's complex traditions, language, and Ancestry transcend the lines prescribed by colonial governance as Ngoonooru came into being through their Creation, Ancestors, Law, and land.

At contact, colonisers observed the land through a prescribed, Euro-centric lens, occupied by socio-cultural ideas of expansion and 'primitive' cultures. When arriving in Australia, Europeans looked at the Western Australian landscape with their argument based on the admittance that 'there is something in the Anglo-Saxon theory of covering the earth' (Trove 1893). A direct result of colonisation is the Meekatharra township.

The Meekatharra township was founded due to pastoralisation and boomed concurrently with the Nanine gold rush. The first European colonial settlement of the Meekatharra township was in 1894, with prospectors following in 1896. The first registered mine in the Murchison area was the Nannine Mine. A miner's path to the Nannine mine intersected the Meekatharra district, contributing to the Meekatharra Mine's establishment in 1896. With the extension of the railway line from Nannine to Meekatharra, Nannine began its decline. Due to this influx of miners and pastoralists, Meekatharra soon became the largest town in the Murchison area by 1914 (Heydon 1990).

The pursuit of gold and pastoral lands in the Murchison region resulted in the exploitation of resources. This exploitation drastically altered the landscape and the Ngoonooru people's relationship with their traditional lands and waters. As colonisation progressed, Aboriginal

people were perceived as a dying 'primitive' culture. This 'primitivity' mindset is exhibited throughout historical publications like The Gwydir Examiner and Moree General Advertiser (Trove 1898), who published 'A Doomed Race' in 1898. 'A Doomed Race' detailed that the 'Australian race is disappearing from the face of the earth' and then detailed census details regarding births and death (Trove 1898, p.4). This mentality embodied in Western Australian colonial settlements resulted in the works of Daisy Bates (1944; 1985). Daisy Bates's (1944; 1985) works were partly intended to contribute to the 'preservation' of Traditional life and the knowledge systems of Aboriginal peoples in Western Australia before colonisation destroyed it. Bates was engaged by the Western Australian Government to undertake investigations into Aboriginal life and culture, resulting in a contact period between Bates and present-day Ngoonooru peoples' ancestors during her field expeditions from 1910 to 1912. Bates recorded the genealogy of Ngoonooru families across Ngoonooru Country, including those of the current study area, during her expeditions of 1910-1912. These recorded genealogies provide details of ancestors' Traditional names, names of descendants and spouses, skin group affiliation, language, and place names. The Ngoonooru people consulted during this assessment are the descendants of the Ngoonooru people recorded by Bates. In addition to Bates's records of Ngoonooru genealogy, names of places with Traditional connections to particular Ngoonooru individuals and families have also been documented. Bates's record aids the following report and the collaboration of intangible oral histories.

Figure 2 - Geographical Survey of Western Australia 1911., Topographical Map of Meekatharra; H.W.B Talbot, assistant field geologist; A. Gibb Maitland, government geologist; R.H. Irwin, del., Boston Public Library, 39999085936118, accessed 25 March 2023.

Ngoonooru's contact history has endured the invasive and destructive effects of the mining and pastoral industry. The mining and infrastructure boom in Meekatharra involved extensions to the railway. The extension of the railway was met with hostility, as seen by the *Kalgoorlie Miner* (Trove 1927), stating on 12 May 1927 in their Wiluna Railway article that,

> Any suggestion that the proposed railway extension should go from Meekatharra in order to use the port of Geraldton is ill-advised and detrimental to the interests of the State as a while, and to the mining industry in particular'.

Nonetheless, the resulting railway ensured the future occupation and colonial settlement of Ngonooru Country in the pursuit of resources.

Europeans that came to the Meekatharra area portrayed a heightened concern with water sources and access to them, confronted by their drastically changing environments. Therefore, as a result, these arriving Europeans were in awe of Aboriginal survival methods during periods of drought. In response to these survival anxieties, European water sources started to appear and infiltrate Aboriginal water sources as they intersected traditional knowledge and practices surrounding water sources. Traditional knowledge of water sources meant visiting and maintaining specific water sources and knowing where and how to find these water sources. Maintaining water sources is central to respecting the Ancestral resources provided to Ngoonooru Country.

Colonial dependency on Aboriginal peoples to find water sources often resulted in cruel and inhumane circumstances; this speaks to Aboriginal people's complex knowledge systems of their environment and the feverish attempts to control it. One of the earliest written accounts of Australian gnammas [Rock-holes] (although Ngoonooru people did not use that term) was that of Austin (1856), who, like several nineteenth-century explorers who followed, held an Aborigine captive to find water during his exploration of the Murchison region of Western Australia (Bailey 1999).

Garden Gully Creek is located within the Meekatharra Shire, running westward along the Great Northern Highway, north of the Meekatharra township (Shire of Meekatharra 2017). Garden Gully Creek is registered by the Heritage Council (Place Number 25188) as a significant water source and place of gold discovery. As a significant water source, Garden Gully Creek is shaded by river gums, wild life, and various flora of cultural significance. Furthermore, the Garden Gully Creeks contact history is captured with the settlement of Meekatharra, with social events hosted by the creek and the instillation of a 10-head battery in 1894 by Garden Gully G.M. CO (Shire of Meekatharra 2017). Garden Gully Creek then exhibited more tangible tracks with the surrounding topography, a main track from Meekatharra to Garden Gully,

Abbotts, and Peak Hill (Shire of Meekatharra 2017). Tangible European tracks often occupy the Ancestral pathways related to various topographical features, informing the pursuit of water, food, and settlement. Also situated north of Meekatharra is the Yalgar River which feeds the Hope River and is a tributary of the Murchison River.

Like water sources, accessing food and resources on Ngoonooru Country's semi-arid to arid climate is unique. It speaks to the complexities of seasons and the types of resources that could be found. Certain plants were used for medicinal purposes, nourishment and as a water source. Food sources were not limited to berries and fruit but also grubs living on specific plants and water contained in certain plant roots. Ensuring plant knowledge was shared, and regeneration was maintained for the flora and fauna of Ngoonooru Country to continue to survive. This idea of regeneration and land management of native plants was not shared with the incoming colonial settlements. Incoming colonial settlements introduced foreign animals, resulting in the overgrazing of native plants and the soiling of natural water sources. Trees were used with European settlement and land management concepts, and crops were attempted and challenged by the unique climate. Despite this history, Ngoonooru has retained the Traditional knowledge systems required to recover and continue nurturing their traditional lands and waters and has maintained their relationship with the Country.

During the times of early colonization, several important locations that hold both historical and traditional connections include the Peak Hill Aboriginal Reserve, Karalundi Mission and the Canning Stock Route, which are related to the area of the proposed alignment.

The Peak Hill Goldfield and mining ghost town is located 120 km north of Meekatharra; with exploration of the Peak Hill area occurring in the 1890s, the town was gazetted in 1897 (Heydon, 1991). The Peak Hill Aboriginal Reserve and ration station were located within this area. The Peak Hill Aboriginal Reserve provided rations for Aboriginal people under the Aboriginal Protectorate and, although outside of the current study area, is of important significance and history of Ngoonooru people.

Karalundi Mission, located 60 km from Meekatharra on the Great Northern Highway in close proximity to the survey alignment, was established in 1954 by the Western Conference of the Seventh Day Adventist Church as a ‘native institution’ (Rosser, 2015). The Mission delivered primary school classes and Christian education for up to 50 Aboriginal children aged eight (8) years and older. The Mission was operating as a training school by 1960 with 90 children aged nine (9) to 16 and aimed to be self-sufficient through the children’s manual labour training, including vegetable gardening, poultry farming, caring for stock, irrigation and water supply for the boys and ‘mothercraft’ and home management for the girls. The Mission school closed down in 1974; the reasons given included population drops and the new commonwealth policy

encouraging tribal customs and not housing children at the schools, which was at odds with the church's philosophy. In 1986 it became Karalundi Aboriginal Education Centre (KAEC) with links to the Seventh-Day Adventist Church. The mission site is adjacent to the proposed alignment. Ngoonooru people attended school and worked at this site, and have historical as well ancestral connections to the area.

In 1906 the Canning Stock Route was developed, running from the Kimberly to the Murchison the Route was completed in 1908 when the railway arrived in Meektharra, making the town the railhead. The railway served pastoral interests in Meektharra until its closure in 1978. The Stock Route transected 15 language groups, and the dreaming tracks crossing the Country (National Museum of Australia, 2009). The 54 wells making up the Route opened the desert to travel, changing the social and cultural landscape of the desert in unprecedented ways as it and the European settlers it brought acted as a catalyst for Aboriginal people to move, often to the outskirts of towns such as Meekatharra.

4.2 Ethnographic Survey findings

Significant water sources to Ngoonooru people include Garden Garden Creek, Yalgar River, Murchison River and their associated tributaries. The survey area is intersected by tributaries of both Garden Gully Creek and the Yalgar River. Ngoonooru people hold oral creation stories relating to such water sources, which are understood to have been created by serpents. These are all sacred places to Ngoonooru people.

As Walley (2023) told it during the ethnographic survey, as we (Ngoonooru) know our Native wells, 'Water was everything'. Meekatharra Creek (Meekatha, Ngoonooru name; Compton 2023) lies west of modern-day Meekatharra. The Ngoonooru history associated with Meekatharra Creek is both post-contact and Ancestral Walley (2023) and Compton (2023), recount contact histories with Meekatharra Creek with their annual visits to Meekatharra to sell cattle or horse races. Ngoonooru would set up their camp outside the township's boundary, near the creek, singing in language after travelling on foot (often from Belele Station) (Walley 2023).

Pre-contact use of these water sources is captured in oral histories and was changed in the face of colonisation. Continuing to engage with water sources on Ngoonooru Country, like Meekatharra Creek and the Yalgar River is how Ngoonooru histories have survived.

This ethnographic research also discussed select plants and their uses within Ngoonooru Country. Ngoonooru Country captures an arid and semi-arid expanse in the Murchison-Gascoyne region. Country, culture, and sustenance are intertwined; therefore, by looking at

the following plants, occupation, gender roles, resourcing, and regeneration, the relationships are evident. Relationships to resources and their access extend into harvesting, preparation, and water reserves.

The Mallee eucalypt is also known as the Water tree to Ngoonooru. When Mallee is found with the right-sized roots, they provide a substantial source of hydration (Walley, 2023). Seeds and fruit are a food source from many trees, shrubs, and herbs around Ngoonooru Country. River red gums (Eucalyptus camaldulensis) are a rarer Eucalypt. River Red Gum seeds are collected and ground by women. The gendered preparation of this flour speaks to Traditional Ngoonooru practice and the intimacies of roles. Preparing Red River Gum seeds relates to material possession and creation as the seeds must be ground with a grinding stone on top of an animal's skin to catch the flour (Walley, 2023). Once ground, this flour is made into steamed or baked products (Leyland and Yamaji Language Centre 2002). As this product would require water and the red gums grew near water, this process was often completed when the water and seeds were collected. The Red River Gums found on Ngoonooru Country are endemic to Western Australia.

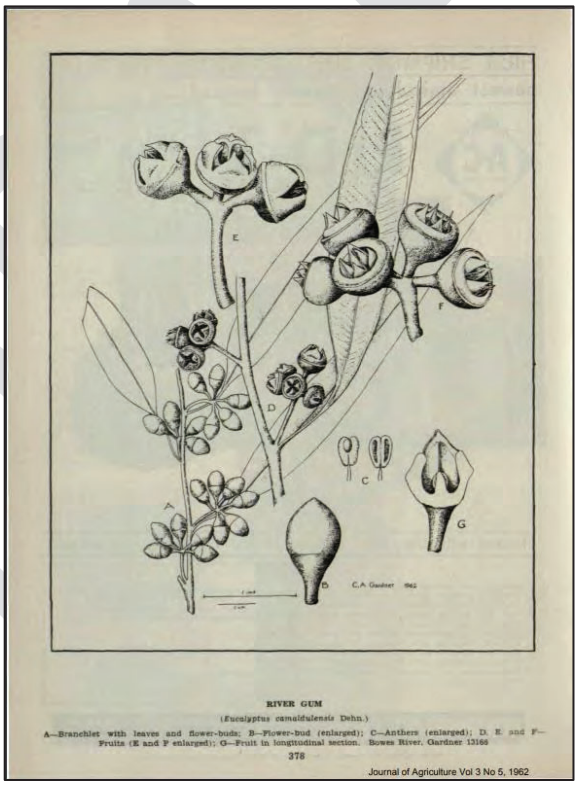


Figure 3 – Red River Gum (Eucalyptus camaldulensis Dehn.) Trees of Western Australia, C.A. Gardner, Journal of Agriculture, Vol. 3, No. 5, 1962, p.378.

Figure 4 – Red River Gum seed pod and flower, Western Australia, Ngoonooru Country 23 March (Photograph by Celine Mucke).

Figure 5 - Red River Gum tree, Western Australia, Ngoonooru Country 23 March (Photograph by Celine Mucke).

Ngoonooru women often stayed near resources that required processing. This was similar to Hop Mulga (*Acacia crasoedocaroa*). Hop Mulga has Jardungu seeds (Ngoonooru name) and

is also found along river channels with seeds that need to be ground once to pod is no longer green (Walley, 2023; Compton, 2023). Alternatively, the seed pods are eaten by children when they are green as a snack (Walley, 2023).

Certain trees provide fruit and berries that do not require processing. Quandong (Santalum acuminatum) fruit has a sweet flesh, and once the seed's shell is broken, they are edible in that form (Walley, 2023; Leyland and Yamaji Language Centre, 2002). The location of Quandong is similar to the Red River Gum tree, near river channels. The regrowth of the Quandong tree is parasitic as their regrowth depends on a host plant.

Figure 6 – Quandong Tree, Western Australia, Ngoonooru Country 23 March (Photograph by Celine Mucke).

Also reliant on water courses, the Beef wood tree (Grevillea striata; Ngoonooru name, Yarra). Beef wood is endemic to Western Australia and named by Europeans due to the visual texture of the wood grain being like beef (Walley, 2023). For Ngoonooru use, the Beef woods wood was strong enough for protective tools like shields (Walley, 2023). With many plants in this region responding to the environment, the Western Myall (Acacia papyrocarpa) grows near limestone plains (Walley, 2023). The Western myall will take over from where gum trees grow and die (Walley, 2023).

The Native Poplar (Codoncocarpus cotinifolius) (Florabase n.d) is visually identifiable with its reference to European poplars and saturation of the leaves (Australian Native Plants n.d). The Native Poplar is found throughout Ngoonooru Country and is known to Ngoonooru for its medicinal properties. In line with its common name being the toothache plant, the Native

Poplar is a narcotic and chewing the leaves on an ailing tooth relieves pain (Walley 2023). Beyond its medicinal uses, the Native Poplar also has Bardi grub in the trunk when young, and its dead wood is useful for starting fires (Walley, 2023).

Another tree growing throughout Ngoonooru with medicinal purposes is Butter Bush (Pittosporum angustifolium) (Compton, 2023). Butter Bush leaves are steamed and used in women's businesses (Compton, 2023). The orange berries on the butter bush are poisonous, as shown in the photograph below. Many smaller shrubs, herbs, and low-lying vegetation support the ecological regeneration of the above flora, like the pebble bush (Florabase n.d). The Pebble bush (Stylobasium spathulatum) is a perennial shrub that provides an edible seed. While still present in the appropriate conditions, the low-lying vegetation that should be present is short-lived, being destroyed by grazing and pest animals (cattle, donkeys, camels, and rabbits). These grazing animals and pests favour juvenile plants like Stalum spicatum. As a result, no young trees are coming up and growing into mature trees. With no regeneration, land management activities have to look to counteract the effects of these introduced animals and revegetate with those species, using new methods to protect the seedlings so they can grow. This evolving activity in Ngoonooru Country has changed how plant life grows on the landscape. The variety of uses in one or many plants references the experience and knowledge captured in Ngoonooru Traditional knowledge systems and ongoing land management.

Figure 7 - Image of Butter bush and berries on Vocus corridor, 24 March (Photograph by Celine Mucke).

4.3 Conclusions of Ethnographic Survey

Despite the effects of European colonisation working to displace culture and Country, the Ngoonooru people maintain their knowledge of and connection to the area. The proposed optic fibre alignment fits within a wider landscape that has and continues to hold high significance to the Ngoonooru people. Traditional connections with Garden Gully Creek and Yalgar and Murchison Rivers and their surrounds are evidenced by the work of Daisy Bates. Ngoonooru people not only hold traditional connections to the area but also hold significant historical heritage connections to the historic Canning Stock Route, Karalundi Mission and Peak Hill Aboriginal Reserve.

No Aboriginal ethnographic sites in accordance with the definition of s.5 of the Aboriginal Heritage Act (1972) have been identified directly within the Project Horizon proposed Section T09 and T10 alignment during this assessment. Whilst the survey area has been subject to disturbances by past European activities (see results of the archaeological survey), the proposed alignment does hold ecological significance to the Ngoonooru people, and it is recommended to limit impacts to native vegetation and avoidance of harming native trees.

5. Archaeological Survey

5.1 Aims and Methodology

Aims:

An archaeological survey of the proposed Project Horizon T09 and T10 alignment by qualified archaeologists of Archaeological Excavations Pty. Ltd. and Ngoonooru Heritage Officers aimed to establish if any existing Aboriginal Sites or Aboriginal cultural heritage objects are located within the proposed 30-metre corridor.

Methodology:

The heritage survey was undertaken following best-practice methods outlined in Burke and Smith (2004). A systematic archaeological survey was undertaken of the entire 30-metre corridor of the proposed Project Horizon T09 and T10 alignment. The archaeological survey allowed participants to examine ground surfaces for Aboriginal cultural heritage. Six (6) survey participants walked a single transect beginning at the southern end of the proposed alignment. Participants walked at 5-metre wide spacing and flagged identified Aboriginal cultural heritage if present, whilst remaining survey participants undertook GPS and field recording of identified heritage. Photographs of the survey area were taken using a range pole with 200mm increments, and field notes were taken regarding features, ground surface visibility (GSV), and landforms.

Several additional areas for the proposed project were also subject to the heritage survey, as requested by Vocus. These sections were surveyed using the same methodology outlined above, with results presented in the sections below.

5.2 Archaeological Survey Participants

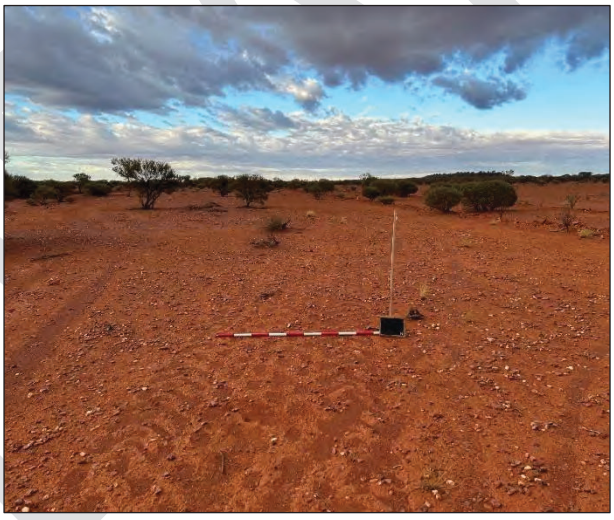
The archaeological survey was undertaken over 12 days between 28 March and 5 May 2023. The survey was conducted by Zachary Buckley (Archaeological Assistant, Archaeological Excavations Pty. Ltd.), Adam Deane (Director, Archaeological Excavations Pty. Ltd.), Francisco Almeida (Archaeologist, Archaeological Excavations Pty. Ltd.), Isabelle Waite (Archaeologist, Archaeological Excavations Pty. Ltd.), Ashleigh Baker (Archaeologist, Archaeological Excavations Pty. Ltd.), Martin Durkan (Archaeological Assistant, Archaeological Excavations Pty. Ltd.), Kevin Walley (Ngoonooru Elder and Ngoonooru Senior Heritage Officer), Stephen Compton (Ngoonooru Senior Heritage Officer), Joshua Layton (Ngoonooru Heritage Officer), Matthew Berg (Ngoonooru Heritage Officer), Trevor Layton (Ngoonooru Heritage Officer), Shona Walley (Ngoonooru Heritage Officer) and Marley Fraser (Ngoonooru Heritage Officer).

5.3 Archaeological Survey Results

The survey area was systematically surveyed over twelve (12) days beginning at the southern end of the survey area travelling towards the northern end of the proposed alignment. Aboriginal cultural heritage objects, artefact scatters, quarries and culturally modified scar trees were identified during the survey within the proposed alignment (see Maps 5 – 45). Additionally, the survey identified that the area of registered site Thirty Two Mile Well (Place ID 6196) extends across the entire proposed alignment with dense numbers of surface stone artefacts identified. The site registration for this place will be updated with DPLH.

5.3.1 Survey Area 1.1

A systematic pedestrian heritage survey of area 1.1 was undertaken on 28 March 2023. Survey area 1.1 extended for a total of 8,226 metres in length, beginning at the southern end of the proposed alignment for Project Horizon Section T09. The landforms associated with survey area 1.1 comprised of sparse woodland overlaying a single *Wandri Barna* floodplain intersected by several small tributaries of Garden Gully Creek. The landform is gently sloping (c.530m asl on the south to c.510m on the North) and is covered by low or sparse Mulga (*Acacia aneura*) woodland (see Photograph 1).



Photograph 1 - Landscape Photograph of the Start of Survey Area 1.1, facing North.

The GSV was generally considered very good (75% - 100%) for the majority of survey area 1.1, however, was noticeably reduced to 25% to 50% in the creek intersections of the proposed alignment and areas of vegetation. Disturbances within the proposed alignment that were noted included an old rail line, traffic and ground disturbance caused by the installation of a Telstra cable (Photograph 2).

Photograph 2 - Disturbance in survey area 1.1, facing South.

Photograph 3 - Aspect of survey area, showing significant topsoil modification resulting from an old road. E653966 N7064698. Facing Southwest.

A total of 357 cultural objects/artefacts and two archaeological features were identified across the first 8.2 km of the proposed section T09 alignment. The artefact sample is mostly comprised of knapped stone implements – flakes, cores, retouched elements – with variable degrees of weathering/patina, but it includes some examples of grinding stones and hammerstones (see Photographs 4 - 8). The relative absence of small dimension elements suggests differential preservation of the original spatial distribution of knapping areas/ artefact scatters: Smaller items, such as chips or “debitage” seem to have been affected by horizontal and vertical movement and can potentially be concentrated on the subsurface or in sedimentary traps downslope from their original location. The main raw materials represented in the assemblage are quartz, silcrete, chert, opal, jasper and basalt.

An artefact scatter was identified at Easting 651865, Northing 7061704, along the proposed alignment which comprised of stone artefacts sourced from high-quality banded chert. A banded chert outcrop was subsequently recorded at Easting 653193, Northing 7063505, that shows clear marks of having been purposefully fragmented as a source of raw material for the

production of artefacts (see Photograph 7). An artefact scatter of the same raw material was identified immediately adjacent to this outcrop. Artefacts identified at 3.478km appear to have also been made from this parent outcrop.

The locations of the intersecting tributaries of Garden Gully Creek displayed thicker sedimentary sand cover layers with fewer artefacts than previously surveyed areas. The northernmost 1.5 km of the surveyed area shows a higher presence of post-contact artefacts made from glass, metal, plastic, car parts. In general, post-contact landscape modifications are visible in the west of the alignment, where a Telstra cable has been previously installed, and East of the survey corridor, where the signs of modification by the early road and the present-day Great Northern Highway are evident. Still, areas where the *Wandri Barna* type landscape is relatively well preserved can be found within the proposed 30m corridor, especially on the interfluve areas between the aforementioned ephemeral creeks. The latter stand, at this stage, as the main areas of ongoing erosion within the project alignment. During the survey, it was also possible to identify an old abandoned "nest" of a Western Pebble-mound mouse, or Ngadji (*Pseudomys chapmani*) (see Photograph 4).

Photograph 4 - Grinding Stone in survey area 1.1.

Photograph 5 - Banded Chert Flake in survey area 1.1.

Photograph 6 - Greenstone Core in survey area 1.1.

Photograph 7 - Aspect of Banded Chert outcrop-quarry, associated with artefact scatter from the same raw material. E653193 N7063505. Facing Northwest.

Photograph 8 - Silcrete core example identified in survey area 1.1.

Photograph 9 - Abandoned "nest" of Western Pebble-mound mouse, or Ngadji (Pseudomys chapmani). E653772 N7064468. Facing East.

5.3.2 Survey Area 2.1

A total of 7,144 metres along the corridor were surveyed on 29 March 2023, constituting survey area 2.1. The landscape continues to be essentially that of the *Wandri Barna* type, with Mulga (*Acacia aneura*) type woodland intersected by ephemeral tributaries of Garden Gully Creek. Survey area 2.1 is essentially a gently sloping plain, but with the elevation now rising as one travels north (c.510m asl on the south to c. 518m asl on the north). The northern part of survey area 2.1 slowly turns into a hill where granite outcrops become prominent (*Mundra Barna* type Country – Hilly). On this stretch of the proposed alignment, the creek areas presented denser vegetation cover than encountered in survey area 1.1, resulting on GSV values of less than 10% and, at times 0% (see Photograph 10). The dense vegetation across the ground surface can be attributed to recent increased rainfall in the area.

Photograph 10 - Impaired Ground Surface Visibility in Survey Area 2.1, facing North.

There is evidence of a post-contact landscape clearing towards the northern end of survey area 2.1. A higher density of stone occurred on the ground's surface, primarily quartz, accompanied by large knapped cores. The rocky soil slope gently increases towards the north in survey area 2.1, with granite fragments appearing towards the granite rise, also known as *Mundra Barna,* which continued for the remainder of survey area 2.1 (Photograph 11). Stone objects comprised knapped stone implements- flakes, cores, retouched elements, and a single grinding stone displaying weathering and patina. Quartz, silcrete, chert, opal, chalcedony, agate, jasper, and basalt made up the source material of stone artefacts that were identified in survey area 2.1 (see examples Photographs 11 -16). A total count of 378 artefacts and one artefact scatter were identified in survey area 2.1.

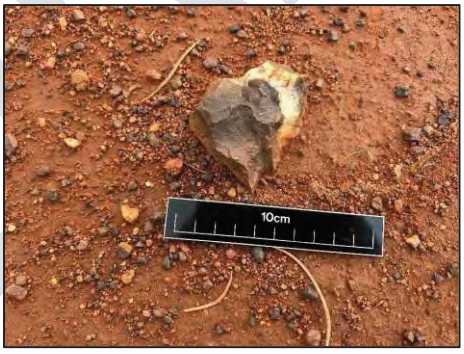
Photograph 11 - Landscape of Survey Area 2.1, facing South.

Photograph 12 - Core identified in survey area 2.1.

Photograph 13 – Artefact scatter made from bottled glass in survey area 2.1, Easting 657859 and Northing 7074604.

Photograph 14 - Chert Flake in survey area 2.1.

Photograph 15 - Banded Chert blade identified in survey area 2.1.



Photograph 16 - Chert core identified in survey area 2.1.

5.3.3 Survey Area 3.1

A severe storm system crossed the alignment area between the 30 and 31 March, preventing the survey team from accessing the proposed alignment, with flooding occurring to significant parts of the survey area. As a result, the survey resumed on 1 April 2023. A total of 7,384 metres along the proposed alignment were surveyed on the day, constituting survey area 3.1. This stretch of the corridor crosses a very gently sloping plain towards the north (c.520m asl on the south to c. 513m asl on the north). The landform of survey area 3.1 is a continuation of the previous area.

The consequences of the storm showed the significant effects on the natural water circulation across the *Wandri* that the construction of the Great Northern Highway has caused. Owing to its higher elevation, the road functions as a dike, interfering with what would be otherwise a natural drainage system. This results in areas where the erosion of the *Wandri* is clearly accelerated. In some cases, the erosion has completely removed the sedimentary layers that originally located above coffee rock. As a consequence, cultural heritage contexts have also been affected and displaced from their original context from this disturbance.

The topsoil in survey area 3.1 begins as a rocky surface with a high density of quartz fragments visible and minimal vegetation, providing very good ground surface visibility (see Photograph 17). Outcrops were identified north of this rocky surface. In the locations where the tributaries of Garden Gully Creek and the Yalga River cross the the proposed alignment there was an observed decrease in ground surface visibility owing to denser vegetation coverage (see Photograph 18).

Photograph 17 - Landscape of Survey Area 3, facing North.

Photograph 18 - Area of low GSV. 658508E 7076954N.Facing North

Photograph 19 - Granite outcrop in survey area 3.1. 658824E 7077591N. Facing Northeast.

Photograph 20 - Linear granite outcrop and scatter in survey area 3.1. 658499E 7076930N. Facing Northeast.

Photograph 21 - Granite outcrop and scatter in survey area 3.1. 659100E 7078101N. Facing Northeast.

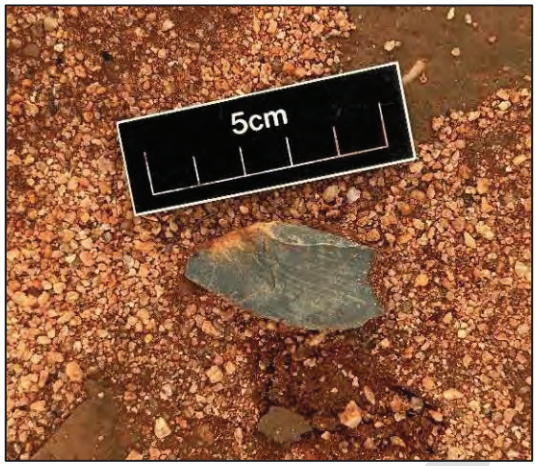
Photograph 22 - Quartz outcrop and scatter in survey area 3.1. 659491E 7078953N. Facing North.

A total of 425 artefacts were identified and recorded within survey area 3.1. Three granite outcrops were also recorded at the locations 658824E, 7077591N; 658499E, 7076930N and 659100E, 7078101N, whilst a quartz outcrop was identified at 659491E 7078953N in survey

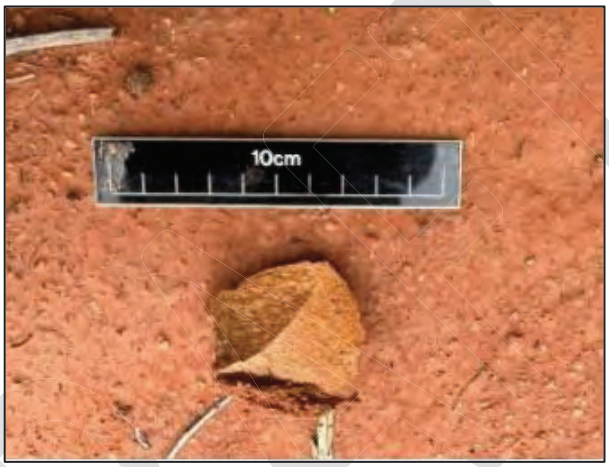
area 3.1. Surface artefacts were observed on the ground surface in each of these locations. The artefact sample is exclusively made up of knapped stone implements – flakes, cores, and retouched elements – with variable degrees of weathering/patina. The raw materials encountered included quartz and chert being the most common, with a variety of other rocks also used for artefact manufacture, such as silcrete, opal, agate, jasper and basalt (see Photographs 23 – 27). The presence of artefacts across the surveyed area are ubiquitous and appear to be independent of soil conditions or localized bedrock variations. The differences in the degree of weathering/patina across the collected sample suggests that the *Wandri* woodland plain has been a stable landform for a significant period of time, and also that artefact manufacture and use has been undertaken in the area also for an extensive period of time. Artefacts identified in embedded subsurface contexts provide an indicator for the preservation of subsurface archaeological contexts within the proposed alignment. The identification of some of the artefacts standing on sedimentary pedestals provides support for the presence of sedimentary sequences that hold the potential for stratified cultural components.

Photograph 23 - Quartz flake.

Photograph 24 – White opal core located in survey area 3.1.



Photograph 25 - Banded chert flake identified in survey area 3.1.



Photograph 26 - Silcrete flake identified in survey area 3.1.

Photograph 27 - Chalcedony flake identified in survey area 3.1.

5.3.4 Survey Area 4.1

A total of 7,277 meters of the proposed alignment was surveyed on 2 April 2023, constituting survey area 4.1. Survey area 4.1 comprised a gently sloping landform occupied by low and sparse Mulga (*Acacia aneura*) woodland and transected by several ephemeral tributaries of the Garden Gully Creek and the Yalgar River, continuing on from previous survey areas. (Photographs 28 and 29). The area was void of any of the dense rocky areas which were prevalent during the previous survey areas. Both the ground surface visibility conditions and the existing vegetation are extremely uniform throughout the 7.377 km surveyed in survey area 4.1, with the exceptions of creek crossings and an identified basalt/greenstone outcrop.

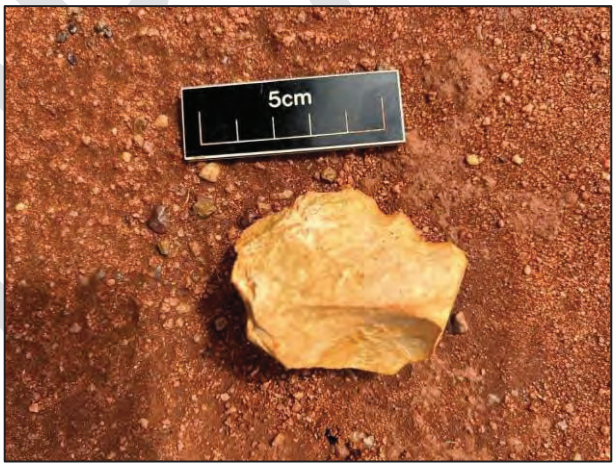
Photograph 28 – Landscape of Survey Area 4.1. 661158E 7083856. Facing South.

Photograph 29 - Landscape of Survey Area 4.1. 665370E 7092840N.

A total of 506 stone artefacts and one (1) quarry were identified in survey area 4.1. A basalt/greenstone outcrop showed profuse signs of exploitation for the production of artefacts (Photograph 30). This outcrop has been assessed as associated with a basalt and greenstone artefact scatter located North of the survey area near the outcrop (Photograph 30). The outcrop quarry is in clear association with a dense artefact scatter that spreads in a northern

direction along the proposed alignment. This is shown by the distribution of artefacts manufactured from the outcrop's greenish basalt that are easily identifiable on the surface. While this raw material dominates the sample of artefacts within the close vicinity of the outcrop, there are other raw materials represented, such as silcrete, chert, jasper, quartz, and "moss agate" from a known source located approximately 60 km to the west of the survey area, and includes some post-contact artefacts made from bottle glass. Examples of artefacts identified in survey area 4.1 are shown in photographs 31 to 36.

Photograph 30 - Basalt/greenstone outcrop/quarry identified in Survey Area 4.1. 662041E 7085664N. Facing Southwest.



Photograph 31 - Silcrete flake showing denticulation identified in survey area 4.1.

Photograph 32 - Jasper core identified in Survey Area 4.1.

Photograph 33 - Basalt blade identified in Survey Area 4.1.

Photograph 34 - Baslat core identified in Survey Area 4.1.

Photograph 35 - Basalt retouched blade located more than 3.5 km north of the basalt outcrop/quarry identified in Survey Area 4.1.

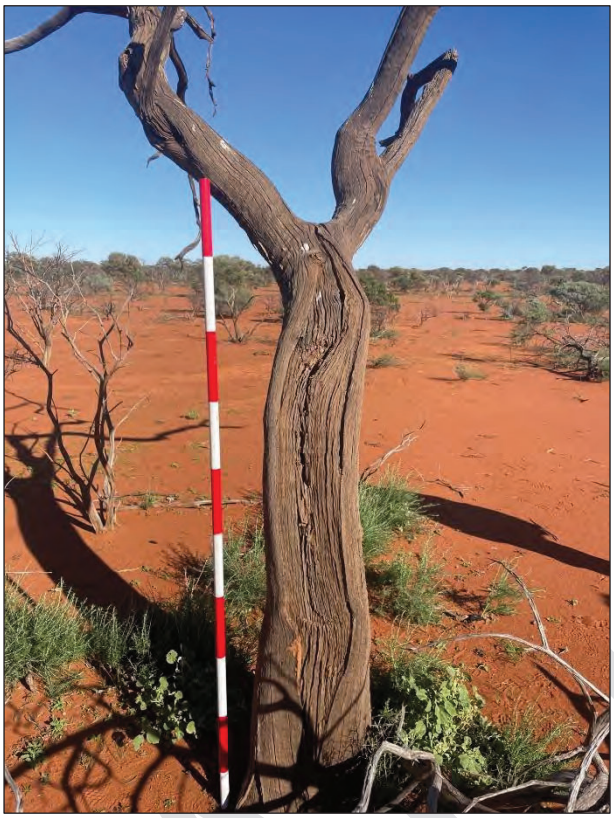
Photograph 36 - Scraper made of glass identified in Survey Area 4.1.

5.3.5 Survey Area 5.1

A total of 6,200 metres of the proposed alignment was surveyed on 18 April 2023, constituting survey area 5.1. The landform associated with survey area 5.1 is the continuation of the previous survey areas, including alluvial plains with low acacia woodland with grass cover. Ground surface visibility within survey area 5.1 varied between being very good (75% - 100%), whilst in areas of vegetation, ground surface visibility was reduced (~50%) (Photograph 37).

Photograph 37 - Landscape of Survey Area 5.1, facing North.

Aboriginal cultural heritage was identified throughout the survey area. An artefact scatter was identified at GPS coordinates Zone 50 (GDA 94) Easting 665303 Northing 7092809. The artefact scatter covers an area 30 meters wide and 50 meters long. The raw material found at the site includes chert, moss agate, quartz, quartzite, and silcrete. The vegetation consists of scrub, mainly small to medium acacias, with occasional larger trees. A culturally modified Scar tree was identified within this survey area at GPS coordinates Zone 50 (GDA 94) Easting 665128 Northing 7092384 (Photograph 38). A low density/isolated stone artefacts were also recorded across survey area 5.1.



Photograph 38 - Culturally Modified Scar Tree in Survey Area 5.1.

Flooding had moved some topsoils to expose coffee rock in sections, revealing artefacts embedded into exposed coffee rock running east/west approximately 15 metres wide, indicative of subsurface archaeology (Photograph 39).

Photograph 39 - Cultural Material Imbedded into Coffee Rock Survey Area 5.1.

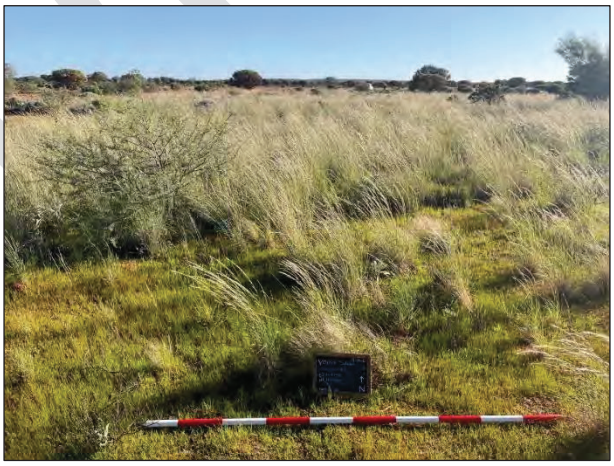
5.3.6 Survey Area 6.1 – 6.2

Survey Area 6.1

A total of 8,100 metres of the proposed alignment was surveyed on 19 April 2023, constituting survey area 6.1. The landform associated with survey area 6.1 is the continuation of the previous survey areas, including alluvial plains with low acacia woodland with grass cover. Survey area 6.1 contained areas of thick vegetation (grass, shrubs) which reduced ground surface visibility to 10-20% (Photographs 40, 41).

Aboriginal cultural heritage was identified throughout survey area 6.1. An artefact scatter consisting of moss agate, chert, quartz, quartzite, chalcedony, basalt, and silcrete was identified at GPS coordinates Zone 50 (GDA 94) Easting 669346 Northing 7103623, where it begins at the road edge and continues 50m east within sparse scrub floodplains.

Photograph 40 - Landscape of Survey Area 6.1, facing North.



Photograph 41 - Thick Vegetation Survey Area 6.1, facing North.

Survey area 6.1 shows disturbances resulting from mining exploration, ripping, drilling, and grading of the ground (Photograph 42). A possible crystal quartz outcropping is located within

100m of GPS coordinates Zone 50 (GDA 94) Easting 668132 Northing 7100095 due to the high quantity of crystal quartz and Aboriginal cultural heritage artefacts made from it. A low density/isolated artefacts were also identified within survey area 6.1.

Photograph 42 - Artefact Scatter Survey Area 6.1, facing North.

Survey Area 6.2

Survey area 6.2 (Photograph 17) constitutes an additional area requested to be surveyed as a possible alternative route. Survey area 6.2 showed signs that this area had been disturbed by grading, rock deposition, and general road construction as it is located close to the highway, and the land had previously been used for a road (Photograph 43).

Photograph 43 - Landscape of Area 6.2, facing North.

Photograph 44 - Disturbance of Survey Area 6.2, facing Northeast.

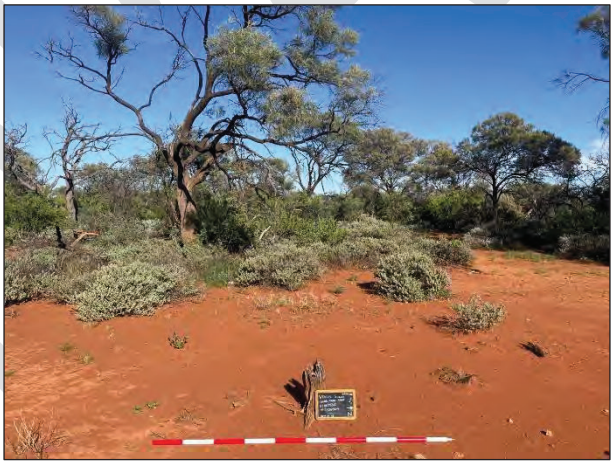
5.3.7 Survey Area 7.1

Survey area 7.1, surveyed on 20 April 2023, consists of floodplains with open, sparse scrub and begins with the continuation of the artefact scatter from Area 6.1. The artefact scatter reduces in density at GPS Coordinates Zone 50 (GDA 94) Easting 669522 Northing 7104128. Edible and medicinal trees, including native plum/cherry, cork trees, Maroon bush (Boogawee), and Water bush, are also present in this survey area (see Photograph 45).

Photograph 45 - Native Plum/Cherry in Survey Area 7.1.

There is an area of high density of scar trees present in survey area 7.1, beginning with isolated finds at Zone 50 Easting (GDA 94) 669 519 Northing 7105979 and Easting 669519 Northing 7105975; with multiple scar trees present at Easting 669530 Northing 7106004 extending East as wide as the alignment allows. These scar trees continue through the alignment with the last recorded at GPS coordinates Zone 50 (GDA 94) Easting 669261 Northing 7109074; these are highly sensitive and require complete avoidance (Photographs 46, 47).

Photograph 46 - Culturally Modified Scar Tree in Survey Area 7.1.

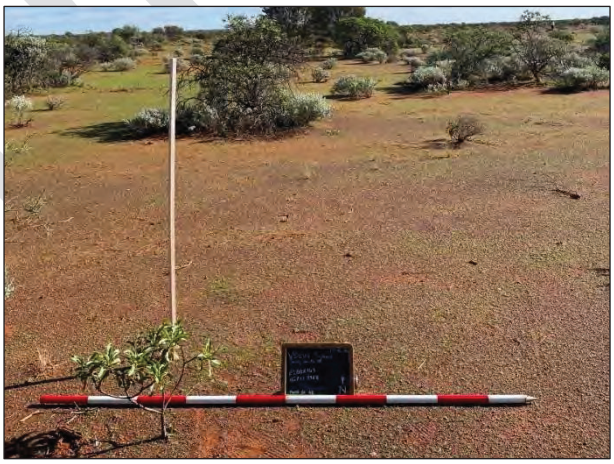


Photograph 47 - Multiple Scar Trees Survey Area 7.1, facing West.

5.3.8 Survey Area 8.1

Survey area 8.1, surveyed on 21 April 2023, consists of alluvial plains with open, sparse scrub providing excellent ground surface visibility. The area contains a high density of artefacts on the ground surface as the alignment travels through the registered site Thirty Two Mile Well (Site ID: 6196) (see Photographs 49). The coordinates for the artefact scatter are Zone 50 (GDA 94) Easting 668807 Northing 7114189. This survey identified a higher density of artefacts outside the registered area to the south, east and north. The area appears to be used as a turning circle for cars and trucks; additionally, either side seems to have been deliberately cleared for a future road. South of the registered site contains low to medium-dense vegetation becoming more sparse towards the North. The further artefacts identified are considered to be a continuation of the registered site Thirty Two Mile Well - Site ID 6196.

Photograph 48 - Landscape of Survey Area 8.1, facing North.



Photograph 49 - Registered Site Thirty Two Mile Well in Survey Area 8.1, facing North.

A tributary of the Yalgar River was recorded at coordinates Zone 50 (GDA 94) Easting 668859 Northing 7114850 within a terrace and floodplain landform where the stratigraphy of topsoil

deposits is visible within the tributary section (see Photographs 50, 51). A large chunk of source material recorded at Easting 668858 Northing 7114861 appears to have been flaked off to reach the high silica contents. Disturbance from the swale drain installation from the highway was found at Zone 50 (GDA 94) Easting 668663 Northing 7117179; no artefacts were found; however, they may still be present within the disturbance.

Photograph 50 - Yalgar Tributary in Survey Area 8.1, facing East.

Photograph 51 - Section of Tributary Walls in Survey Area 8.1, facing North.

5.3.9 Survey Area 9.1-9.2

Survey Area 9.1

Survey area 9.1, surveyed on 22 April 2023, comprises sparse, open scrub within the terrace and floodplain landforms (see Photograph 52). An abandoned Western Pebble Mound mouse nest was recorded at Zone 50 (GDA 94) Easting 669500 Northing 7120226. The Area is disturbed at Zone 50 (GDA 94) Easting 671 466 Northing 7121361 by drainage works running East-West from the road; no artefacts were found but are possibly present within the disturbance. Survey area 9.1 was positioned too close to the Great Northern Highway, which resulted in the surveying being halted at Zone 50 (GDA 94) Easting 672584 Northing 7122215 to wait for alignment correction.

Photograph 52 - Landscape Photograph of Survey Area 9.1, facing North.

Survey Area 9.2

Survey area 9.2 begins at Zone 50 (GDA 94) Easting 681003 Northing 7129454; the area just north of the start point becomes a thick cover of Mulga trees (*Acacia aneura*). Termite mounds were recorded at Zone 50 (GDA 94) Easting 681408 Northing 7129865, which were not previously seen in the survey. The Telstra cable ground disturbance follows along the alignment's western boundary, and a reduction of artefact density is seen along the disturbance. Disturbance from a large mechanical gold mining pit and prospecting disrupts the northern section of area 9.2 (see Photograph 53).

Photograph 53 - Mechanical Gold Mining Disturbance in Survey Area 9.2, facing East.

5.3.10 Survey Area 10.1

On 23 April 2023, the previous disruption from prospecting activities continued into survey area 10.1 with a rocky ground surface that appears to have been turned over and covered in small stones, making artefact identification difficult. The landform continues as alluvial plains vegetated by saltbush and blue bush with open scrub with excellent ground surface visibility. A possible stone arrangement was identified outside of the alignment at GPS coordinates Zone 50 (GDA 94) Easting 689535 Northing 7132502; potential regular stone alignments are visible in an area of extreme stone density, unusual from the surrounding environment (see Photograph 54).

Photograph 54 - Possible Stone Arrangement in Survey Area 10.1, facing North.

An artefact scatter of silcrete was identified at Zone 50 (GDA 94) Easting 692069 Northing 7133543, containing a high density of flakes and the potential for subsurface material (see Photograph 55). The current alignment runs through the artefact scatter and would damage the surface and subsurface material; avoidance is recommended.

Photograph 55 - Artefact Scatter in Survey Area 10.1, facing North.

Another artefact scatter was recorded in survey area 10.1, made up of quartzite with evidence of source material collecting present; the location of this scatter is Zone 50 (GDA 94) Easting 692349 Northing 7133701 (see Photograph 56).

Photograph 56 - Quartzite Artefact Scatter in Survey Area Ten (10), facing North.

The end of survey area 10.1 marked the Northernmost point of the alignment (see Photograph 31).

Photograph 57 - End of Survey Area 10.1, Northern Boundary of Alignment, facing North.

5.3.11 Survey Area 11.1 – 11.2

Survey Area 11.1

Survey area 11.1 was resurveyed on 4 May 2023, covering an area believed to have been surveyed incorrectly; however, the shape file was found to be incorrect, and the original survey had followed the correct alignment. This area was predominantly flat plain with sparse vegetation, with the artefacts consisting mainly of chert, silcrete and quartz.

Survey Area 11.2

Survey area 11.2 alignment was moved approximately 65m off the road and began as flat open plains with moderate rock cover and sparse open scrub and Mulga vegetation and is transected by small tributaries (see Photograph 58). The primary raw materials found include chert, quartz, and silcrete, with some quartzite present. Roughly a kilometre to the North, grading and clearing disturbance was identified, with raw materials showing signs of machine damage. The ground surface visibility was generally excellent, with small areas of increased vegetation and grass cover reducing ground surface visibility. The remainder of survey area 11.2 continued as flat plains with sparse vegetation, an area of increased tree cover and a large creek were recorded towards the north (see Photograph 59).

Photograph 58 - Landscape of Survey Area 11.2, facing Northeast.

Photograph 59 - Water Source in Survey Area 11.2, facing North.

5.3.12 Survey Area 12.1 - 12.3

Survey Area 12.1

Survey area 12.1, surveyed on 5 May 2023, is an approximately 5,000m stretch continuing from survey area 11.2 with flat plains and sparse open scrub; several bush tucker species were identified, including Kogla vines (bush bananas) and Kgulu vine (wild sweet potato). At GPS coordinates Zone 50 (GDA 94) Easting 677729 Northing 7126260, the ground surface changed with a 90% increase in rock cover (see Photograph 60).

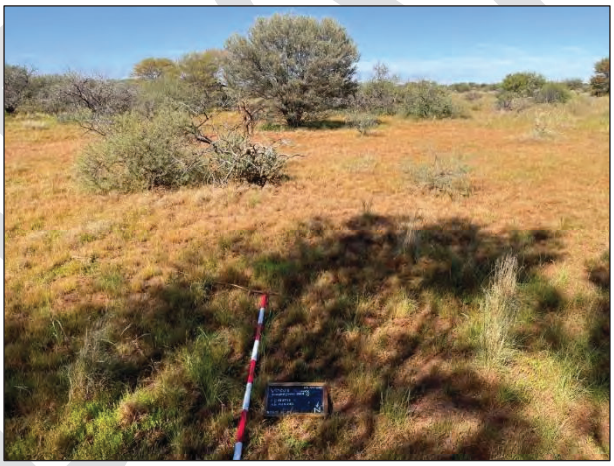
Photograph 60 - Landscape of Survey Area 12.1, facing Northeast.

The alignment crossed the eastern fence line; therefore, the survey line was adjusted to keep a 25m buffer from the fence. A rocky outcrop was surveyed towards the north of area 12.1, with an extent of 100 square meters (see Photograph 35). The rock consisted of large basalt chunks; however, very minimal cultural material was identified on the landform. Grading and vegetation clearing disturbance was recorded at GPS coordinates Zone 50 (GDA 94) Easting 673078 Northing 7122609; however, artefacts could still be recorded within the disturbance.

Photograph 61 - Rocky Outcrop in Survey Area 12.1, facing East.

Survey Area 12.2

Survey area 12.2 covered an approximately 2,000m section, beginning with a ground cover of dense grass, resulting in poor ground surface visibility caused due to the lower elevation of the area as a floodplain (see Photograph 62). The southern section of this area became flat plains with very sparse scrub and no grass cover. This section increased artefact density mainly from chert and silcrete, which can be explained as it runs through the Thirty Two Mile Well registered site.



Photograph 62 - Landscape of Survey Area 12.2, facing South.

Survey Area 12.3

Survey area 12.3 consists of approximately 1,500m of flat alluvial plains, Mulga woodland and excellent Ground Surface Visibility; however, the disturbance was more evident through pieces of road base, glass, and ceramic insulators. Cultural material in the form of silcrete and chert artefacts were found, as well as knapped glass which may suggest a post-contact site (see Photograph 63).

Photograph 63 - Landscape of Survey Area 12.3, facing South.

5.4 Discussion and Conclusions of Archaeological Survey

The survey of the proposed T09 and T10 alignment contains Aboriginal cultural heritage. Aboriginal sites in the form of 28 artefact scatters, 7 outcrop/quarries, and 18 modified cultural trees have been identified within the proposed alignment. In addition to the newly identified artefact scatters, a low-density spread of stone artefacts was identified along the length of the proposed alignment. The areas of these artefacts have not been considered to meet s.5 requirements as Aboriginal Sites, per previous directions by the Aboriginal Cultural Materials Committee (ACMC), are deemed Aboriginal Artefacts under the current AHA. All sites and low-density spread of artefacts are presented on maps 5-45.

The survey identified the registered site Thirty Two Mile Well – Site ID 6196 does extend across the proposed alignment, and as such, the site information for the registered site will be updated with DPLH. A registered site also comes close to the alignment in survey area 6.1, the alignment currently travels along the western side of the Great Eastern Highway, and the site is located directly opposite on the Eastern side. This registered site is Government Well (Site ID: 6195) and is an artefact scatter. Surface stone artefacts considered likely associated with this scatter have been identified within the alignment, as evidenced in survey areas 6.1 and 7.1. The additional site information recorded during the survey will be submitted to DPLH to update current site information for Government Well – ID 6195.

The sites of Andy Well 01-12 (Site ID: 31786), Andy Well 02-12 (Site ID: 31787), Andy Well 03-12 (Site ID: 31788), Andy Well 05-12 (Site ID: 31790), Andy Well 06-12 (Site ID: 31791), Mountain Devil 04-12 (Site ID: 31789), Andy Well 07-12 (Site ID: 31792), and Other Heritage Place Andy Well Isolated Finds (Site ID: 31793) are situated on the eastern side of the Great Northern Highway outside of the proposed alignment and has been considered will not be impacted by the proposed works (see Map 27). The registered site Peak Hill Turn-Off (Site ID:6197) and Other Heritage Place No.1 Bore (Site ID: 6544), situated on the western side of the Great Northern Highway, also do not come into contact with the alignment and will not be disturbed by the planned work.

In addition to the known Aboriginal cultural heritage related to the proposed alignment area, the archaeological survey identified the presence of previously unrecorded Aboriginal cultural heritage. A high density of culturally modified trees was identified in survey areas 5.1 and 7.1. These modified trees were likely used for ceremonial purposes and are considered to meet the requirements of the s.5 as an Aboriginal Site and must be avoided. These modified trees are located within a group of Mulga trees. All these trees hold significance to the Ngoonooru

people, who have requested impact avoidance for these and other native trees within the alignment.

A total of seven outcrops/quarries were identified in the proposed alignment, of which several contained dense artefact scatters that are associated. Additionally, several of the artefact scatters throughout the proposed alignment appear to contain material from these sources. These constitute Aboriginal sites/places and will need to be avoided from harm unless necessary approvals are granted. It is noted the greenstone quarry and scatter identified at Easting 653193, Northing 7063505, is considered of high scientific as well as cultural significance.

A total of 28 artefact scatters have been identified in the proposed alignment (see Maps 5 – 37). These constitute Aboriginal sites/places and will need to be avoided from harm unless necessary approvals are granted. A stone arrangement was identified adjacent survey area 10.1 at Easting 689535, Northing 7132502 to the west; however, as it is located outside of the proposed alignment it is not currently at risk of harm.

The artefact scatters, isolated/low-density spread of Aboriginal stone artefacts, and culturally modified trees provide evidence of a wide range of activities undertaken by Ngoonooru people within the landscape. These activities include stone tool manufacture, ceremonial practices, and food/medicine preparation. The age of the Aboriginal culture cannot be determined based on this study; however, there is evidence of the continued practices by Aboriginal people both pre and post-contact with Europeans. This theory is evidenced by identifying artefacts made from glass bottles, indicating the area contains pre and post-contact Aboriginal cultural heritage.

The survey has been limited to inspecting the ground surface for archaeological evidence of Aboriginal cultural heritage. As such, it should be noted that it has been considered that there is a potential for subsurface deposits of Aboriginal cultural heritage beneath the ground surface. The background geological review indicated a likelihood for buried Quaternary Period deposits to be located within the area. The presence of cultural material embedded into the coffee rock in survey area 5.1 and within eroded creek banks indicates subsurface archaeology. These deposits are likely buried within alluvial and colluvial deposits and cannot be assessed by archaeological surveys alone. Further research is needed to investigate the context and significance of subsurface deposits.

The proposed alignment shows evidence of areas impacted by former works, such as former roads, mining, and prospecting activities, as well as some locations where existing services have been installed. Some areas have been subject to impacts associated with the construction of the Great Northern Highway, such as swale drains and movement of soils. Despite these previous impacts, Aboriginal cultural heritage is present as identified on Maps 5-37.

6. Recommendations

Aboriginal cultural heritage has been identified during the archaeological and ethnographic survey within the Project Horizon Section T09 and T10 proposed alignment corridor (see Maps 5-37).

The Ngoonooru Wajarri Land Committee prefer to avoid harm to their heritage; however, they understand the proposed works will be undertaken across their traditional lands and waters. To allow the works to proceed, the Committee has requested that Ngoonooru heritage be managed according to best practices outlined by national and international standards, including the Australian ICOMOS Burra Charter 1999 and the United Nations Declaration of Human Rights of Indigenous People.

Artefact scatters, isolated stone artefacts, quarries and culturally modified scar trees have been identified within the surveyed area. The specified artefact scatters, quarries and culturally modified trees are considered Aboriginal sites per s.5 of the AHA and directions of the ACMC. The following recommendations have been developed in consultation with Ngoonooru Heritage Officers and are subject to approval by the Ngoonooru Wajarri Land Committee and relevant legislative requirements. It is noted that this project will likely fit a transitional project under the newly implemented *Aboriginal Cultural Heritage Act 2021* (ACHA), and as such, section 18 applications may still apply. It is understood Vocus have held discussions with DPLH. Alternatively, as the proposed project is likely a tier 3 activity under the ACHA, a cultural heritage management plan may be prepared in consultation with the Ngoonooru Wajarri Land Committee for the necessary approval process for impacting Aboriginal cultural heritage sites/places within the proposed alignment.

6.1 Previously Registered Aboriginal Sites and Other Heritage Places

Before this assessment, there was one (1) Registered Site that affected the Project Horizon Section T09 and T10 alignment, with nine (9) additional registered sites and two (2) Other Heritage Places in close proximity (see Table 1). Recommendations for these sites and places are outlined below:

6.1.1 Site ID: 6196 Thirty Two Mile Well – Artefact Scatter – Registered Site

Thirty Two Mile Well (Site ID: 6196), has been lodged with DPLH, with the boundary extending along the alignment for approximately 430m in this location (see Map 27). This registration is described as an artefact scatter. Evidence for this site was observed within the proposed alignment in the form of a high-density spread of artefacts identified across the 430m area. The registration is situated on the western and eastern sides of the Great Northern Highway

within the proposed alignment. Due to the high density of artefacts on the west side of the road, an alternative alignment along the eastern roadside has been proposed, as the artefact density is lower is this area. As the site is located inside of the proposed alignment, an application for a Section 18 is required in consultation with the Ngoonooru Land Committee, subject to agreeable management impact and management conditions - if the project is transitional under the new ACHA.

Alternatively, as the proposed project is likely a tier 3 activity under the newly implemented ACHA, a cultural heritage management plan may be prepared in consultation with the Ngoonooru Wajarri Land Committee for the necessary approvals to impact Aboriginal cultural heritage sites/places within the proposed alignment.

6.1.2 Site ID: 6195 Government Well – Artefact Scatter – Registered Site

The registered site Government Well (Site ID: 6195) is a dense artefact scatter and the survey has identified the site extends across the proposed alignment (see Map 18). This scatter is recommended for avoidance. As the site is located inside of the proposed alignment, an application for a Section 18 is required in consultation with the Ngoonooru Land Committee, subject to agreeable management impact and management conditions - if the project is transitional under the new ACHA.

Alternatively, as the proposed project is likely a tier 3 activity under the newly implemented ACHA, a cultural heritage management plan may be prepared in consultation with the Ngoonooru Wajarri Land Committee for the necessary approvals to impact Aboriginal cultural heritage sites/places within the proposed alignment.

6.2 Newly Identified Aboriginal Sites and Artefacts identified in the Project Horizon Section T09 and T10 Proposed Alignment

It is recommended that newly identified Aboriginal artefact scatters and scarred trees be registered as Aboriginal Sites with DPLH. Further archaeological investigation is required to record the level of detail required for registration with DPLH, which was outside the scope of this study.

6.2.1 New Identified Artefact Scatters and Quarries/Outcrops

Artefact scatters have been identified within the proposed Project Horizon Section T09 and T10 alignment. These scatters are recommended for avoidance and are detailed on Maps 6

to 37. In order to avoid impacting these scatters, an alternate construction technique using directional drilling should be undertaken at these locations. If avoidance is impossible, approvals to impact the site will be required for proposed impacts. As the sites are located inside of the proposed alignment, an application for a Section 18 is required in consultation with the Ngoonooru Land Committee, subject to agreeable management impact and management conditions if the project is transitional under the new ACHA.

Alternatively, as the proposed project is likely a tier 3 activity under the newly implemented ACHA, a cultural heritage management plan may be prepared in consultation with the Ngoonooru Wajarri Land Committee for the necessary approvals to impact Aboriginal cultural heritage sites/places within the proposed alignment.

6.2.2 Isolated and Low Density Cultural Material/Artefacts

If possible, to avoid the stone artefacts identified as not constituting an Aboriginal Sites in accordance with s. 5 of the AHA, it is recommended a buffer of 10 metres be established to ensure no harm occurs to the artefacts. These locations of the artefacts are shown on Maps 5 – 37.

If avoidance is not possible to the location of the recorded isolated/low-density stone artefacts identified along the alignment, a salvage program should be undertaken with Ngoonooru Heritage Officers to recover and relocate the artefacts so they are not harmed during the proposed works. A salvage program is recommended in light of on-site discussions concerning occupational health and safety concerns using Ngoonooru Heritage Officers undertaking monitoring during the construction works.

It is recommended that salvage and relocation of the stone artefacts be undertaken in accordance with best practices in Aboriginal cultural heritage management. The salvage and relocation program must be undertaken in consultation with the Ngoonooru Wajarri Land Committee. It should be provided with two (2) weeks' notice prior to the commencement of the salvage program. In accordance with best practices in Aboriginal cultural heritage management, the salvage and relocation program should include the following methodology;

- The salvage of surface artefacts should be undertaken by a minimum of two (2) Ngoonooru Heritage Officers and a suitably qualified Archaeologist and Archaeological Assistant;
- The location of each recovered artefact must be recorded with a differential GPS (DGPS), including x,y, and z coordinates following the best archaeological methods;

- All recovered artefacts must be individually bagged and labelled with all relevant information;
- On completion of the surface salvage of artefacts, all recovered artefacts should be catalogued, including a detailed analysis of stone artefact attributes in accordance with best archaeological practice;
- A report detailing the salvage program and analysis must be prepared within 12 months days of the salvage being completed;
- After completing the salvage program report, all recovered Aboriginal artefacts must be repatriated to the Ngoonooru Wajarri Land Committee. The recovered Aboriginal artefacts must be reburied in a location as agreed upon by the Ngoonooru Wajarri Land Committee as close to the place of origin within 60 days of the completion of analysis.

The Proponent will bear all costs incurred for undertaking the salvage and relocation program of the cultural artefacts within the proposed alignment area.

6.2.3 Aboriginal Scarred Trees and Native Trees within the proposed alignment

Culturally modified trees (Scarred Trees) have been identified along the proposed alignment in survey areas 5.1 and 7.1 (see Maps 23, 24 and 25). These trees are considered Aboriginal sites in accordance with s5 of the AHA and are recommended for avoidance. A buffer of 50 metres radius should be established to ensure no harm to the trees. It is additionally recommended the location of the group of trees that include scarred trees also be avoided during the undertaking of proposed works.

6.2.4 Directional Drilling

The location of pits for directional drilling that have not been highlighted in orange on Maps 5 to 37 and are not identified as part of an Aboriginal site are recommended to be subject to the salvage of surface artefacts per Recommendation 6.2.2.

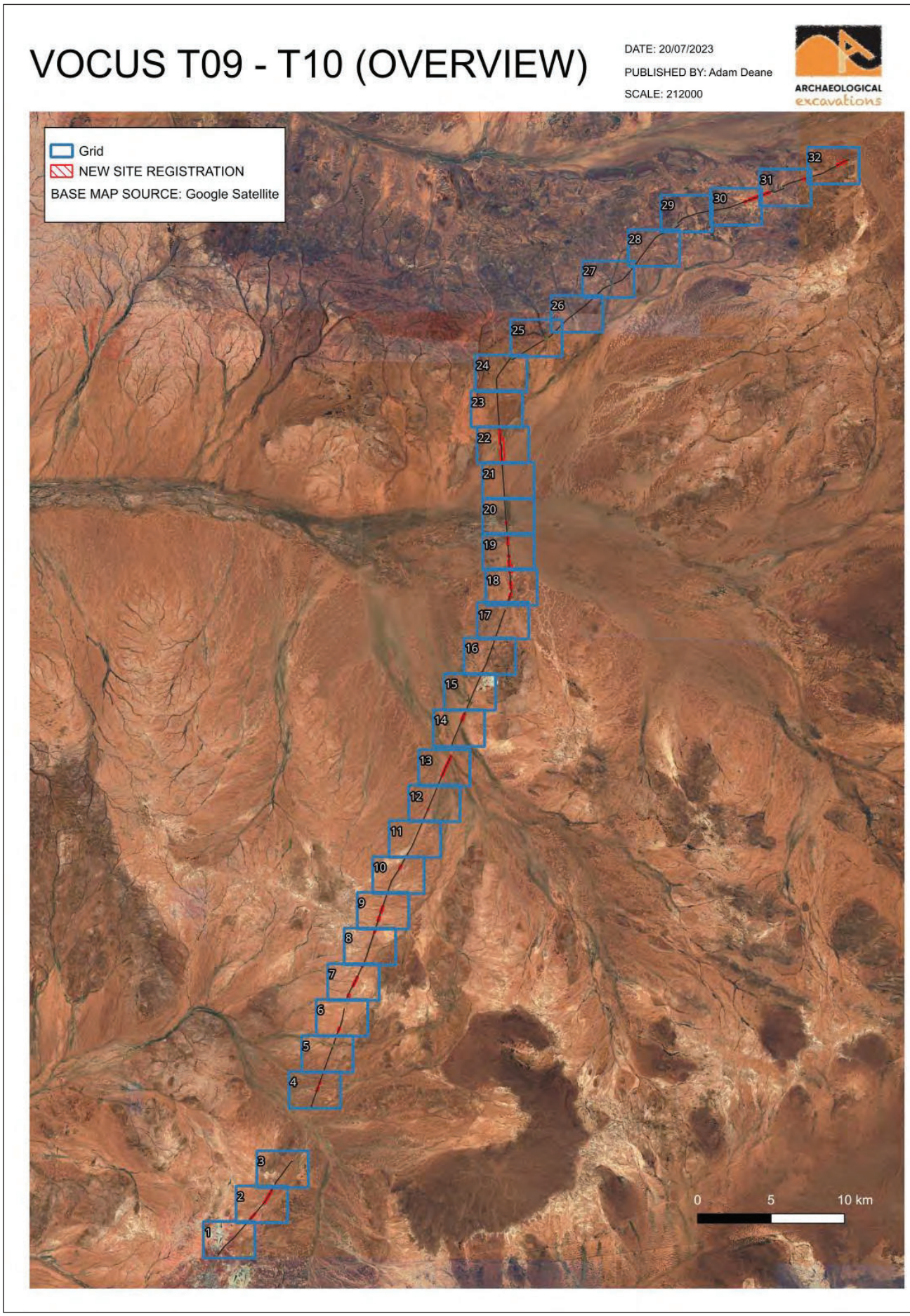
6.2.5 Monitoring of the excavation of Bell Holes for Directional Drilling

During the survey, it was determined that there is a potential for subsurface deposits within the proposed alignment to contain Aboriginal cultural heritage. Therefore, there is a potential for Aboriginal cultural heritage to be uncovered or harmed during the excavation of bell holes required for directional drilling. Therefore, monitoring of bell hole excavation is recommended to identify, record and recover any artefacts that may reside in subsurface contexts.

The monitoring program should include the following;

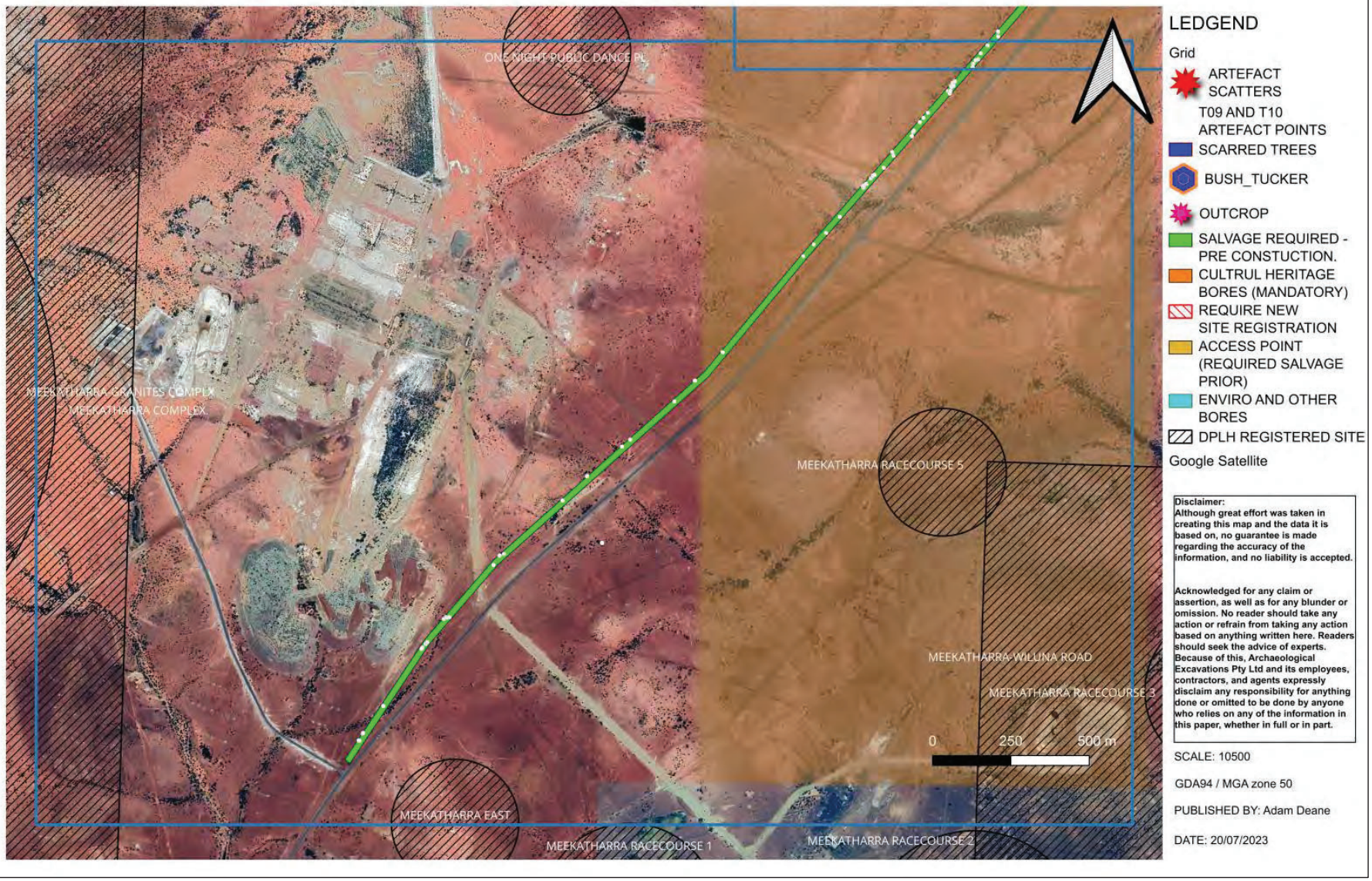
- A minimum of two (2) Ngoonooru Heritage Officers, an Archaeologist and an Archaeological Assistant to undertake monitoring of the excavation of bell holes to identify, record and recover any heritage that may reside in subsurface contexts;
- The mechanical excavation of the bell holes must be undertaken in controlled spits (controlled depths) to allow monitors to visibly inspect the excavation pit after each controlled spit to identify, record and recover any artefacts identified in the pit;
- The location of any identified Aboriginal artefacts identified within the excavated pit should be fully recorded with a dGPS, including x,y, and z coordinates;
- A report detailing the results of the monitoring program and analysis of recovered artefacts must be prepared within 12 months of the monitoring being completed;
- On completion of the monitoring, all recovered Aboriginal artefacts must be repatriated to the Ngoonooru Wajarri Land Committee. The recovered Aboriginal artefacts must be reburied in a location as agreed upon by the Ngoonooru Wajarri Land Committee as close to the place of origin as possible within 60 days of the completion of analysis.

The Proponent will bear all costs incurred for the monitoring program.



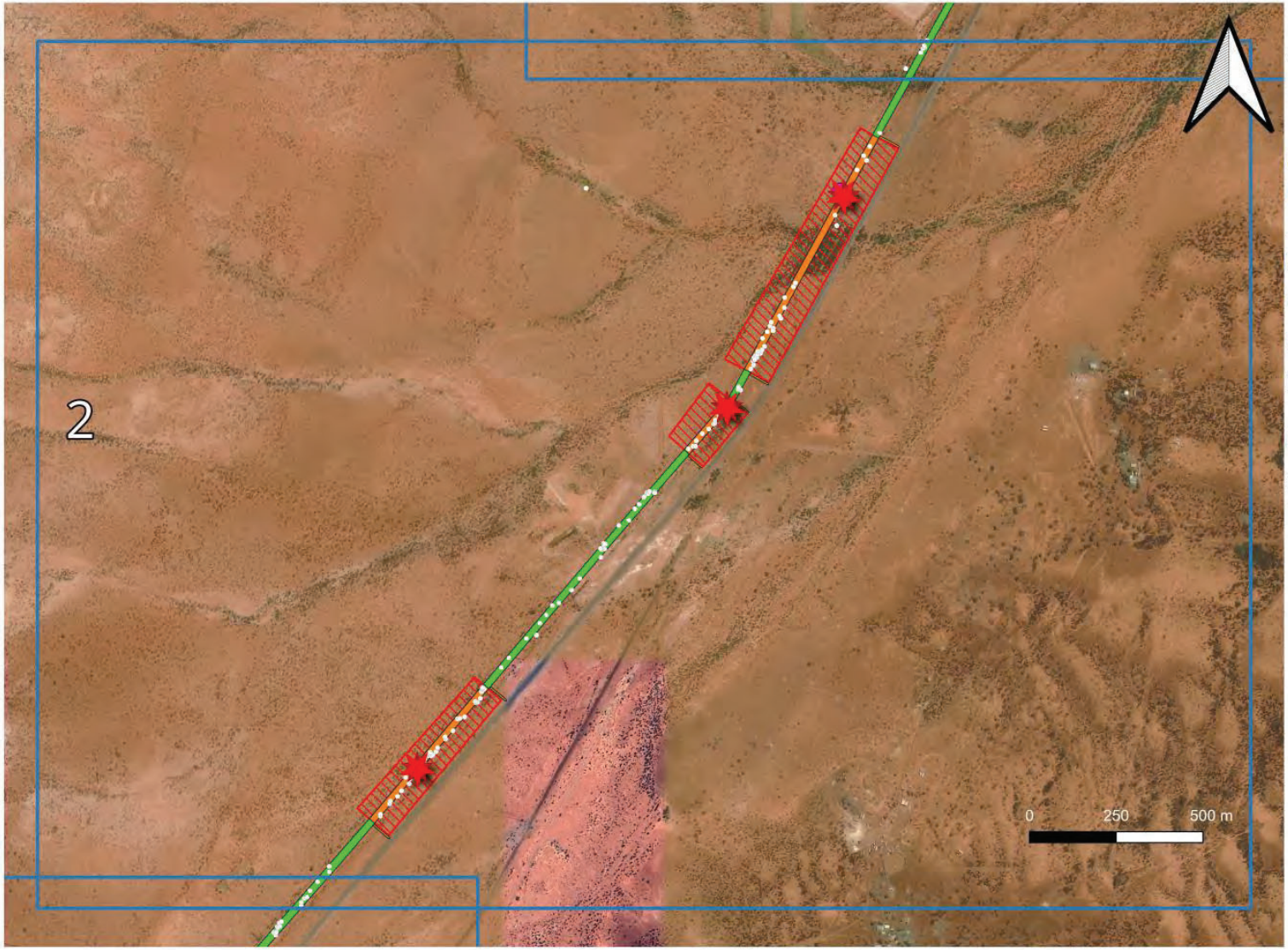
Map 5 - Project Horizon Map Locations Along the Alignment.

VOCUS SURVEY T09 AND T10



Map 6 - Project Horizon T09 and T10 Results and Recommendations 1 of 32.

VOCUS SURVEY T09 AND T10



LEDGEND

Grid

ARTEFACT SCATTERS

T09 AND T10 ARTEFACT POINTS

SCARRED TREES

BUSH_TUCKER

OUTCROP

SALVAGE REQUIRED - PRE CONSTUCTION.

CULTRUL HERITAGE BORES (MANDATORY)

REQUIRE NEW SITE REGISTRATION

ACCESS POINT (REQUIRED SALVAGE PRIOR)

ENVIRO AND OTHER BORES

DPLH REGISTERED SITE

Google Satellite

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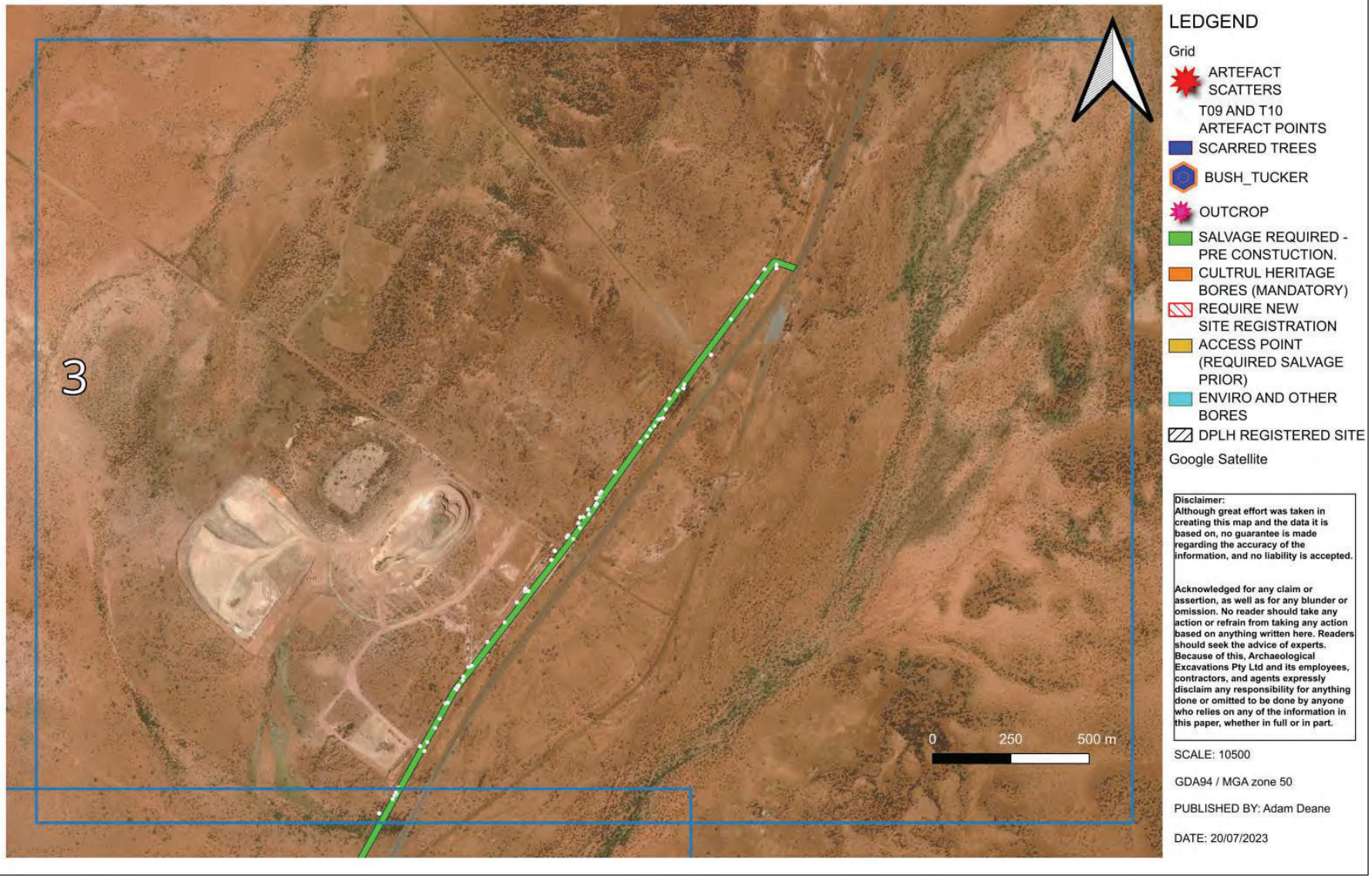
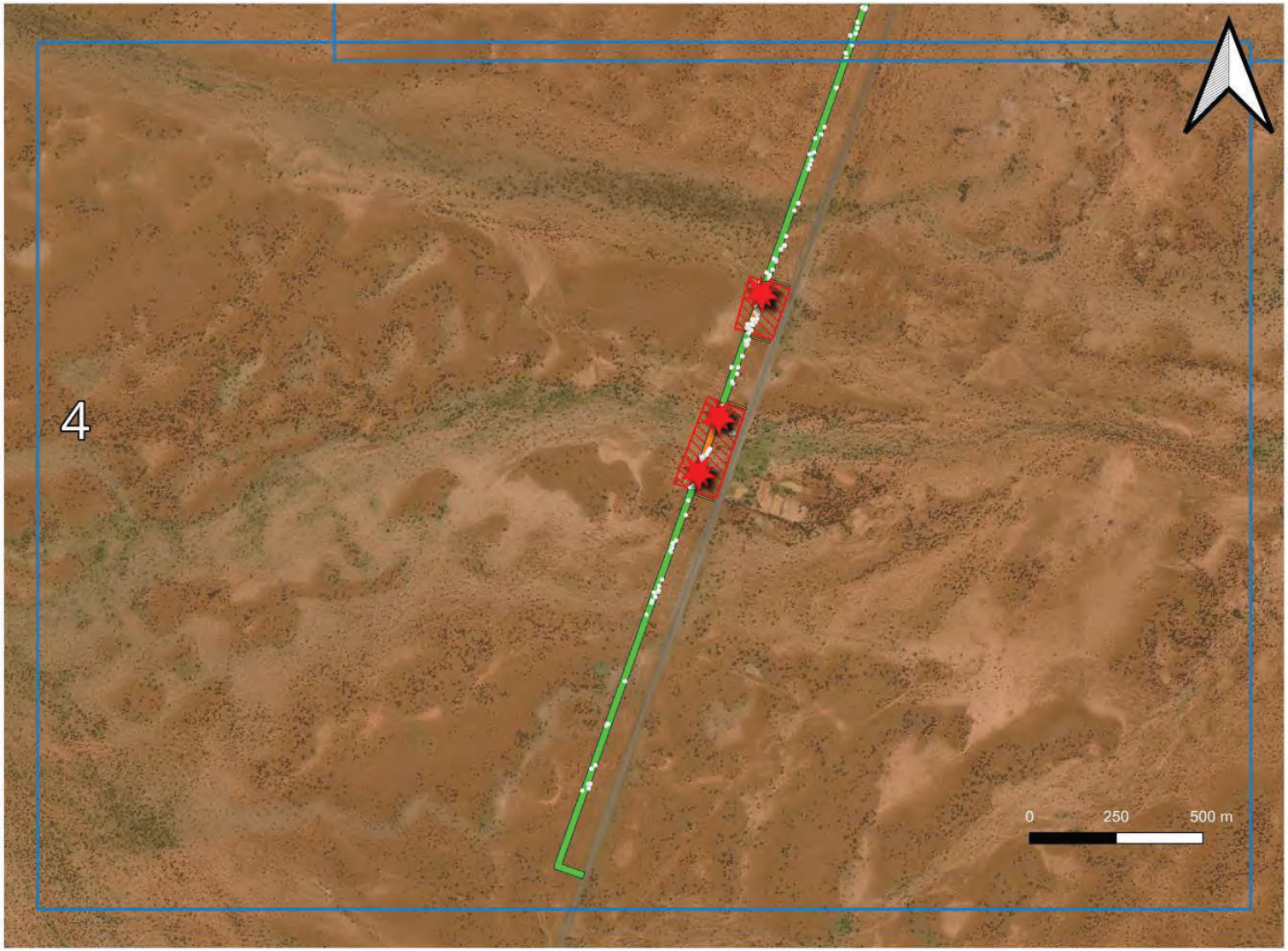
Map 7 - Project Horizon T09 and T10 Results and Recommendations 2 of 32.

VOCUS SURVEY T09 AND T10



Map 8 - Project Horizon T09 and T10 Results and Recommendations 3 of 32.

VOCUS SURVEY T09 AND T10



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Grid

ARTEFACT SCATTERS

T09 AND T10 ARTEFACT POINTS

SCARRED TREES

BUSH_TUCKER

OUTCROP

SALVAGE REQUIRED - PRE CONSTUCTION.

CULTRUL HERITAGE BORES (MANDATORY)

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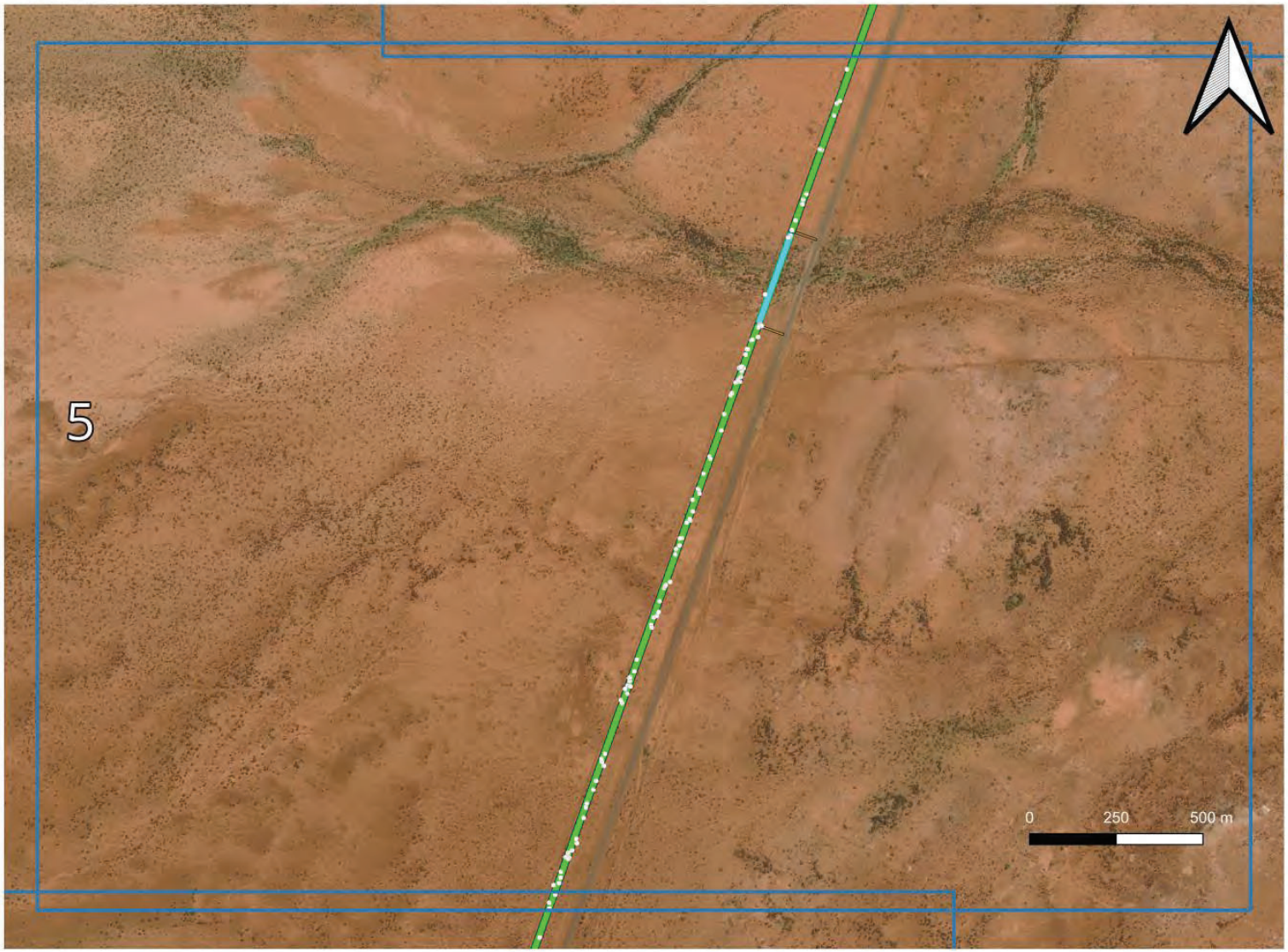
Map 9 - Project Horizon T09 and T10 Results and Recommendations 4 of 32.

VOCUS SURVEY T09 AND T10



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ARTEFACT SCATTERS

T09 AND T10 ARTEFACT POINTS

SCARRED TREES

BUSH_TUCKER

OUTCROP

SALVAGE REQUIRED - PRE CONSTUCTION.

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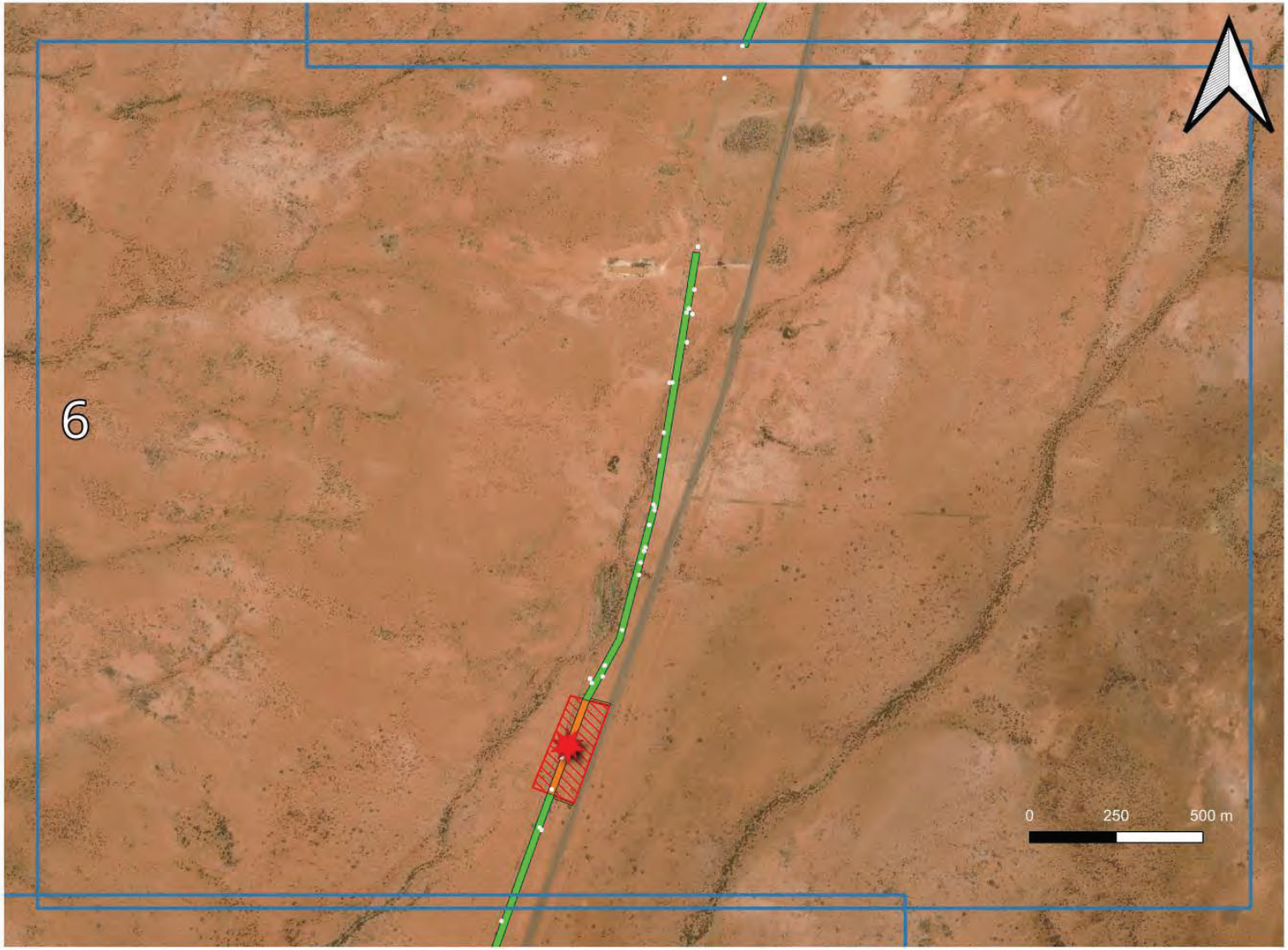
Map 10 - Project Horizon T09 and T10 Results and Recommendations 5 of 32.

VOCUS SURVEY T09 AND T10



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ARTEFACT SCATTERS

T09 AND T10 ARTEFACT POINTS

SCARRED TREES

BUSH_TUCKER

OUTCROP

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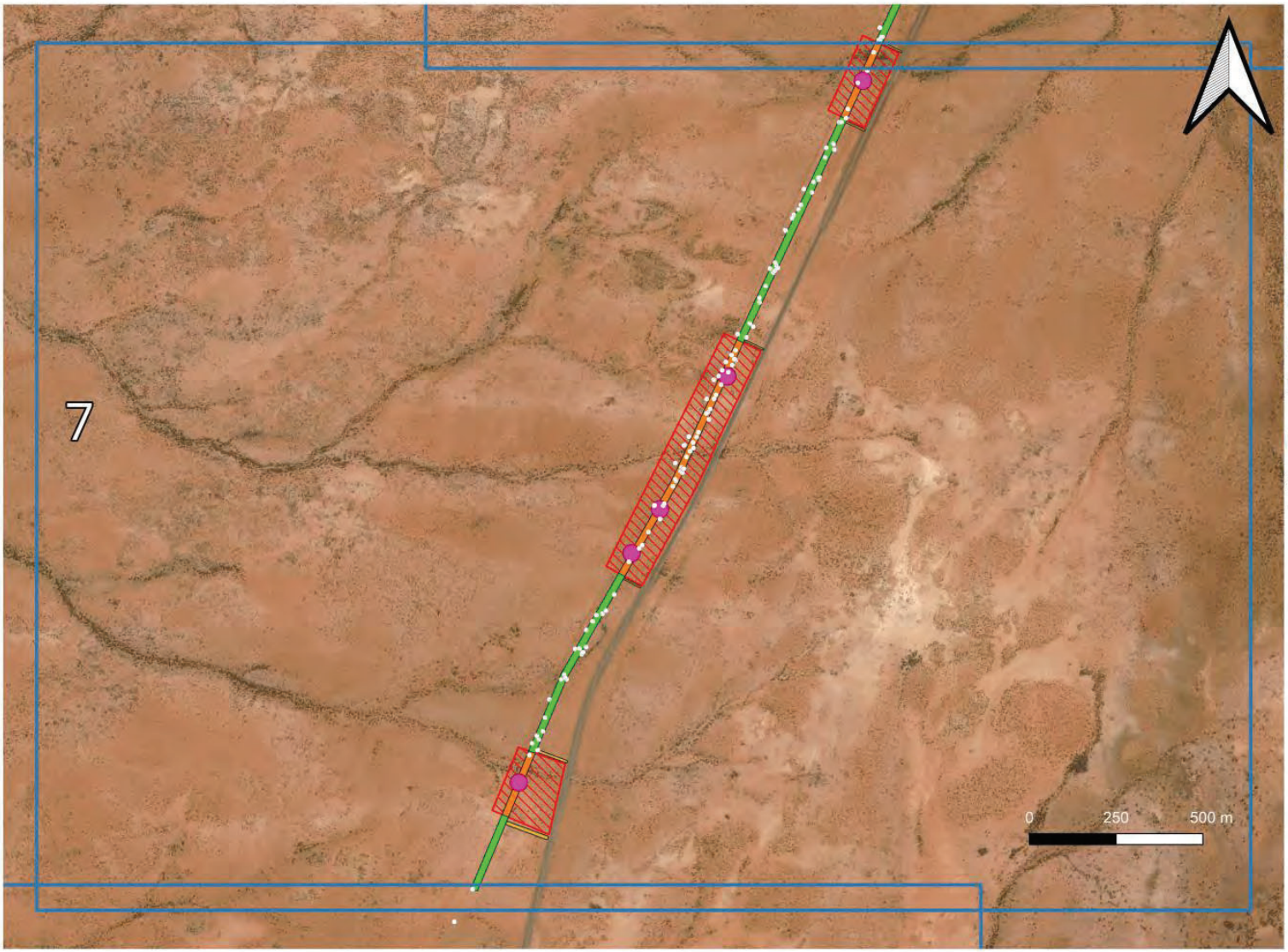
Map 11 - Project Horizon T09 and T10 Results and Recommendations 6 of 32.

VOCUS SURVEY T09 AND T10



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Grid

ARTEFACT SCATTERS

T09 AND T10 ARTEFACT POINTS

SCARRED TREES

BUSH_TUCKER

OUTCROP

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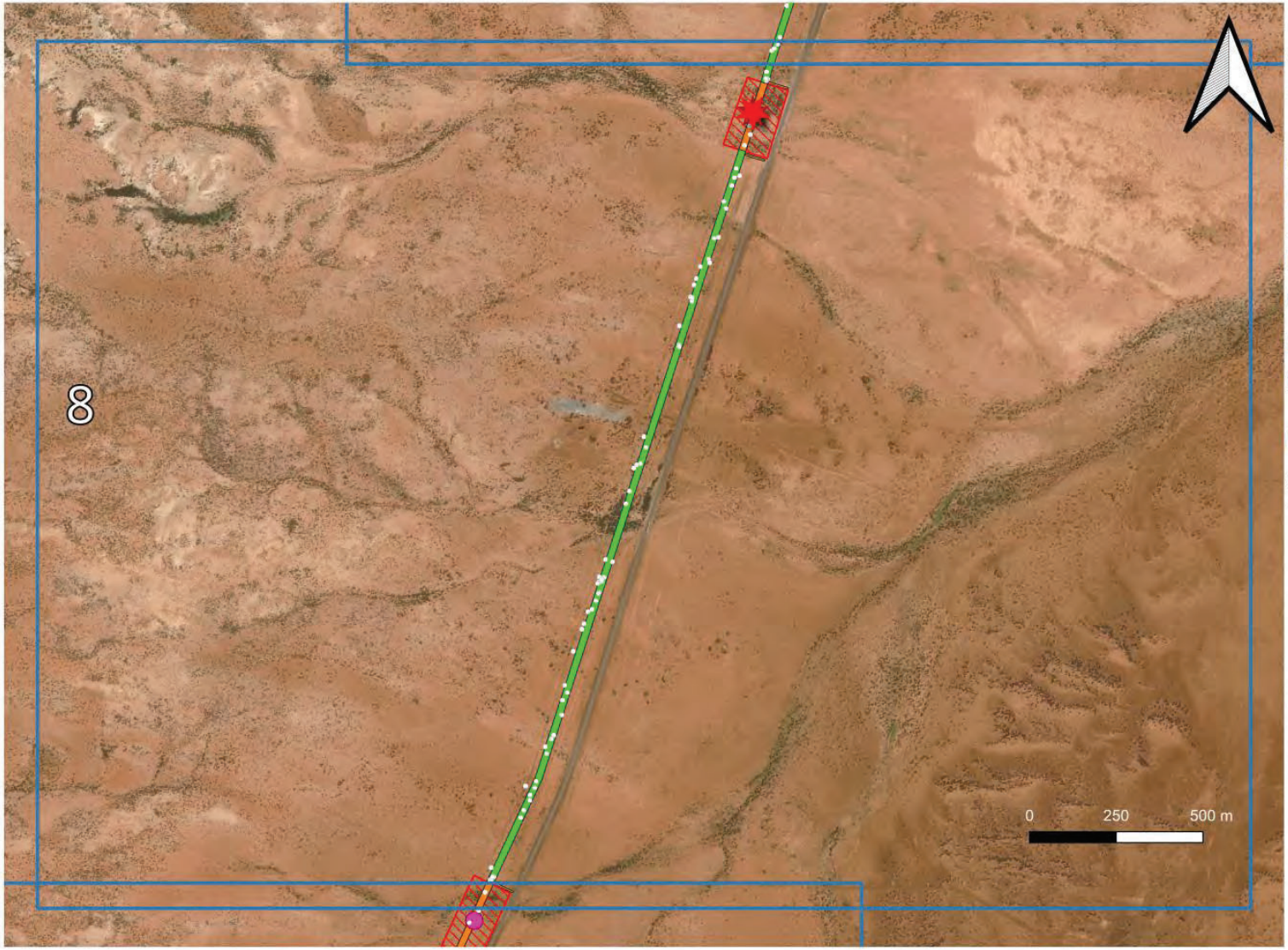
Map 12 - Project Horizon T09 and T10 Results and Recommendations 7 of 32.

VOCUS SURVEY T09 AND T10



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ARTEFACT SCATTERS

T09 AND T10 ARTEFACT POINTS

SCARRED TREES

BUSH_TUCKER

OUTCROP

SALVAGE REQUIRED - PRE CONSTUCTION.

CULTRUL HERITAGE BORES (MANDATORY)

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Map 13 - Project Horizon T09 and T10 Results and Recommendations 8 of 32.

VOCUS SURVEY T09 AND T10

LEDGEND

Grid

ARTEFACT SCATTERS

T09 AND T10 ARTEFACT POINTS

SCARRED TREES

BUSH_TUCKER

OUTCROP

SALVAGE REQUIRED - PRE CONSTUCTION.

CULTRUL HERITAGE BORES (MANDATORY)

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ENVIRO AND OTHER BORES

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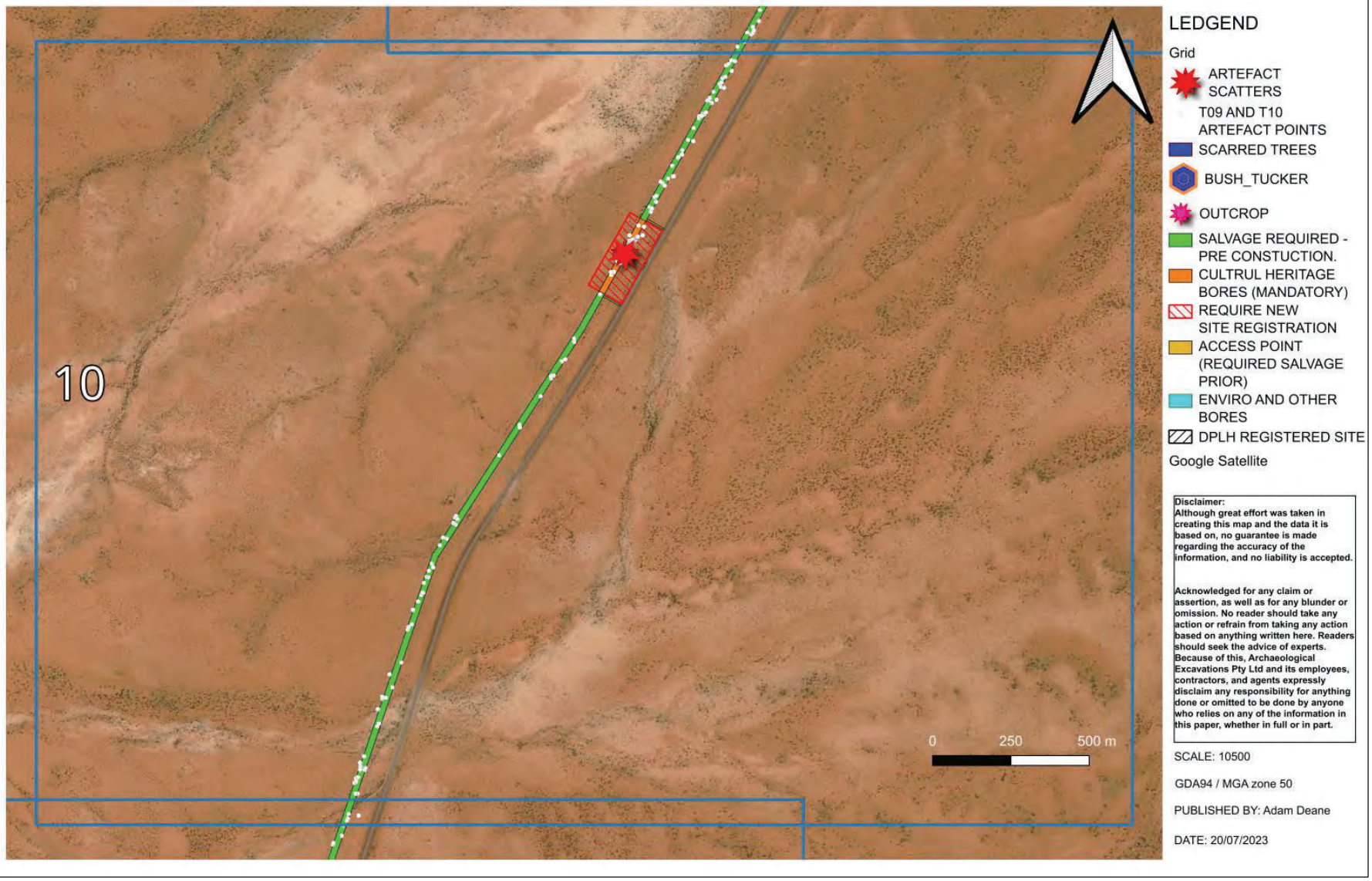
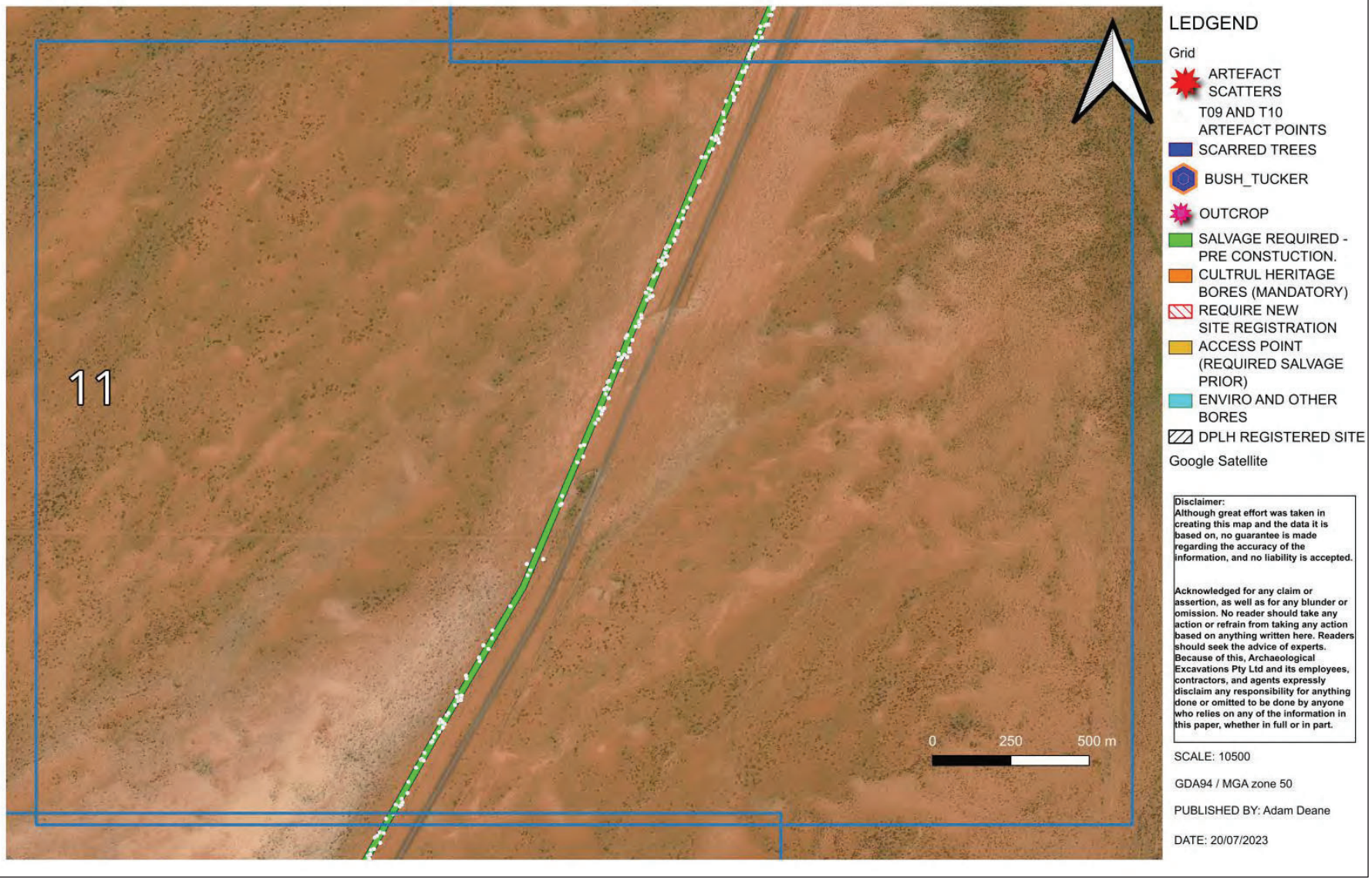
Map 14 - Project Horizon T09 and T10 Results and Recommendations 9 of 32.

VOCUS SURVEY T09 AND T10



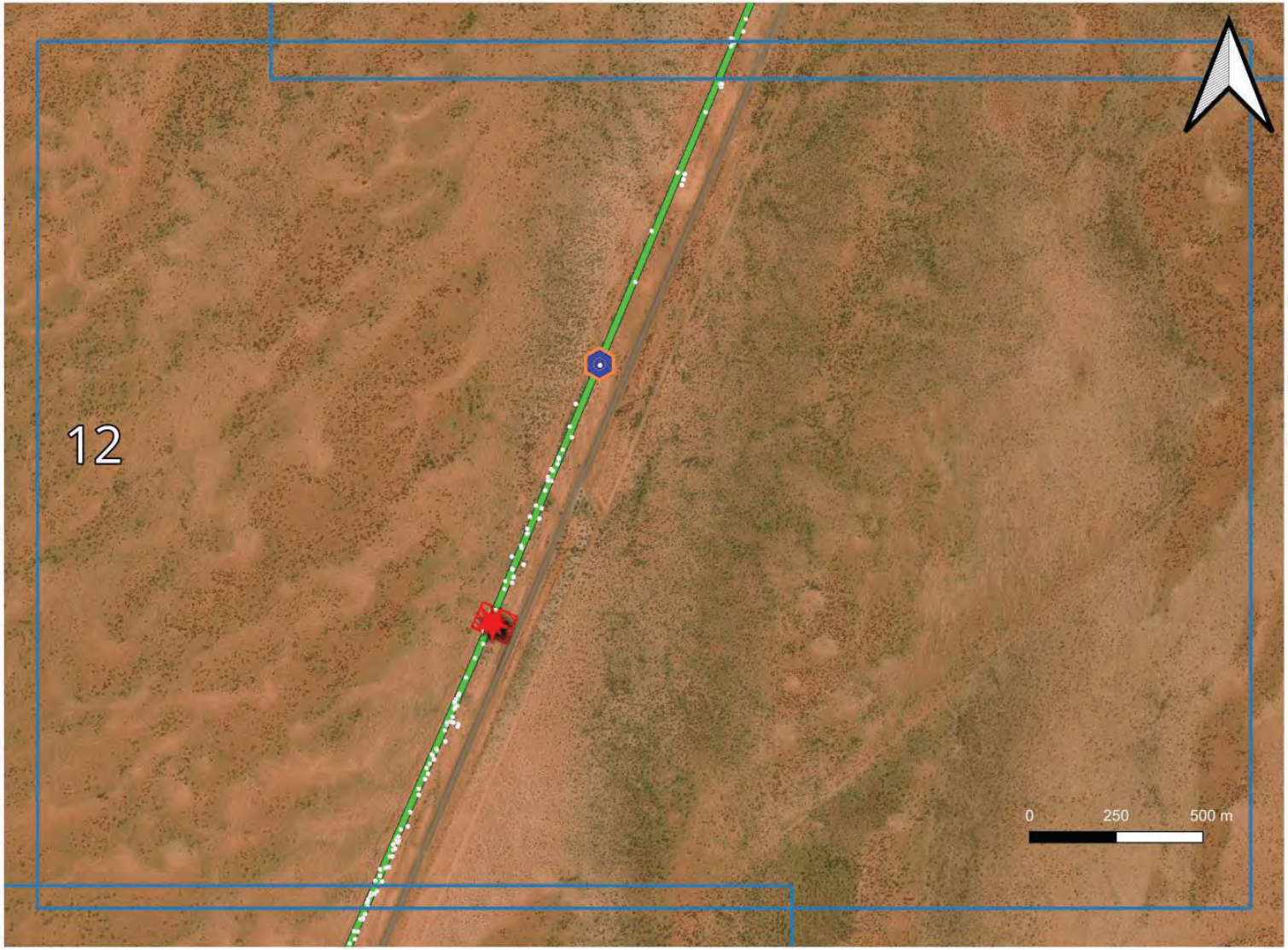
Map 15 - Project Horizon T09 and T10 Results and Recommendations 10 of 32.

VOCUS SURVEY T09 AND T10



Map 16 - Project Horizon T09 and T10 Results and Recommendations 11 of 32.

VOCUS SURVEY T09 AND T10



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ARTEFACT SCATTERS

T09 AND T10 ARTEFACT POINTS

SCARRED TREES

BUSH_TUCKER

OUTCROP

SALVAGE REQUIRED - PRE CONSTUCTION.

CULTRUL HERITAGE BORES (MANDATORY)

REQUIRE NEW SITE REGISTRATION

ACCESS POINT (REQUIRED SALVAGE PRIOR)

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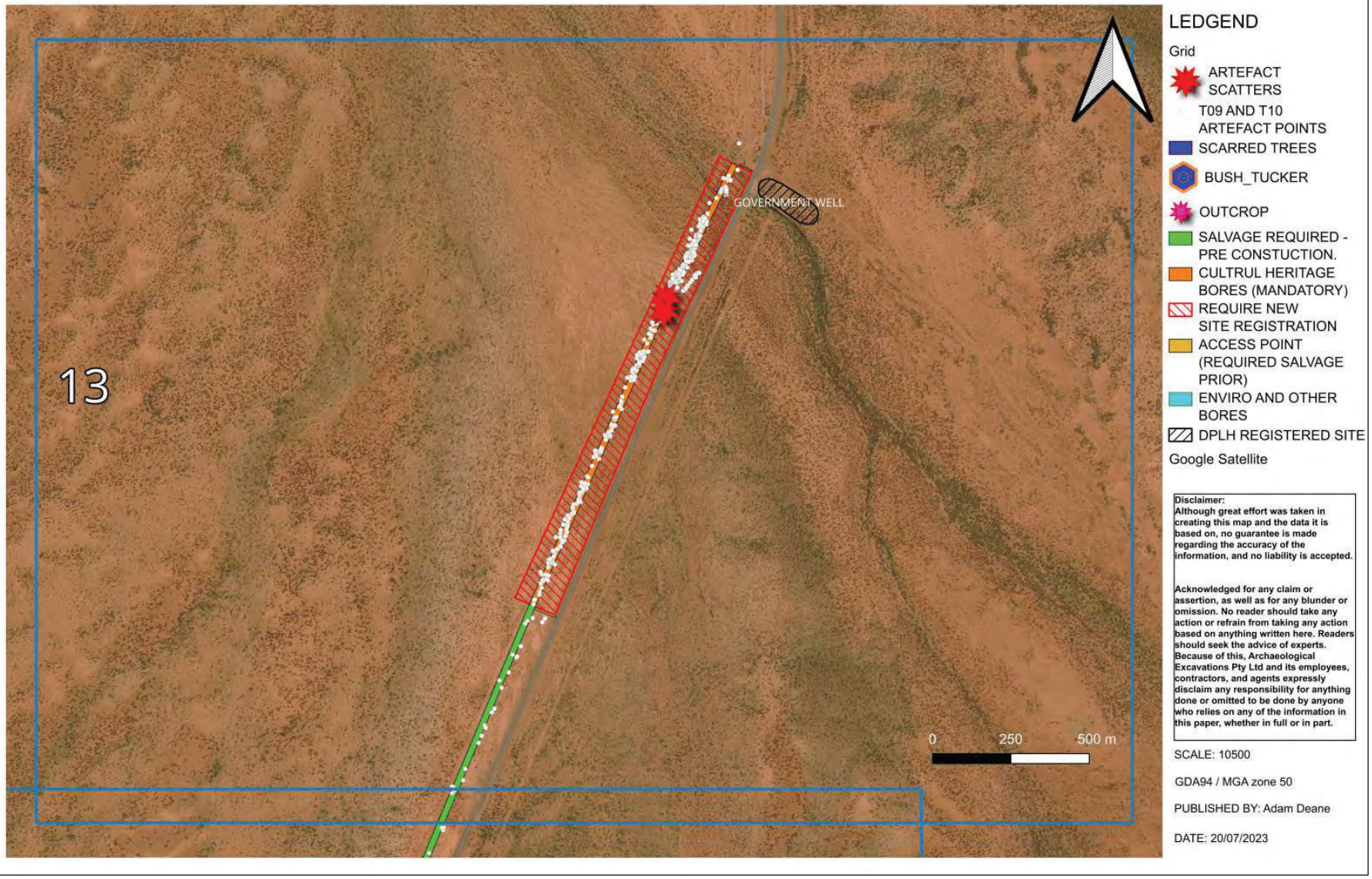
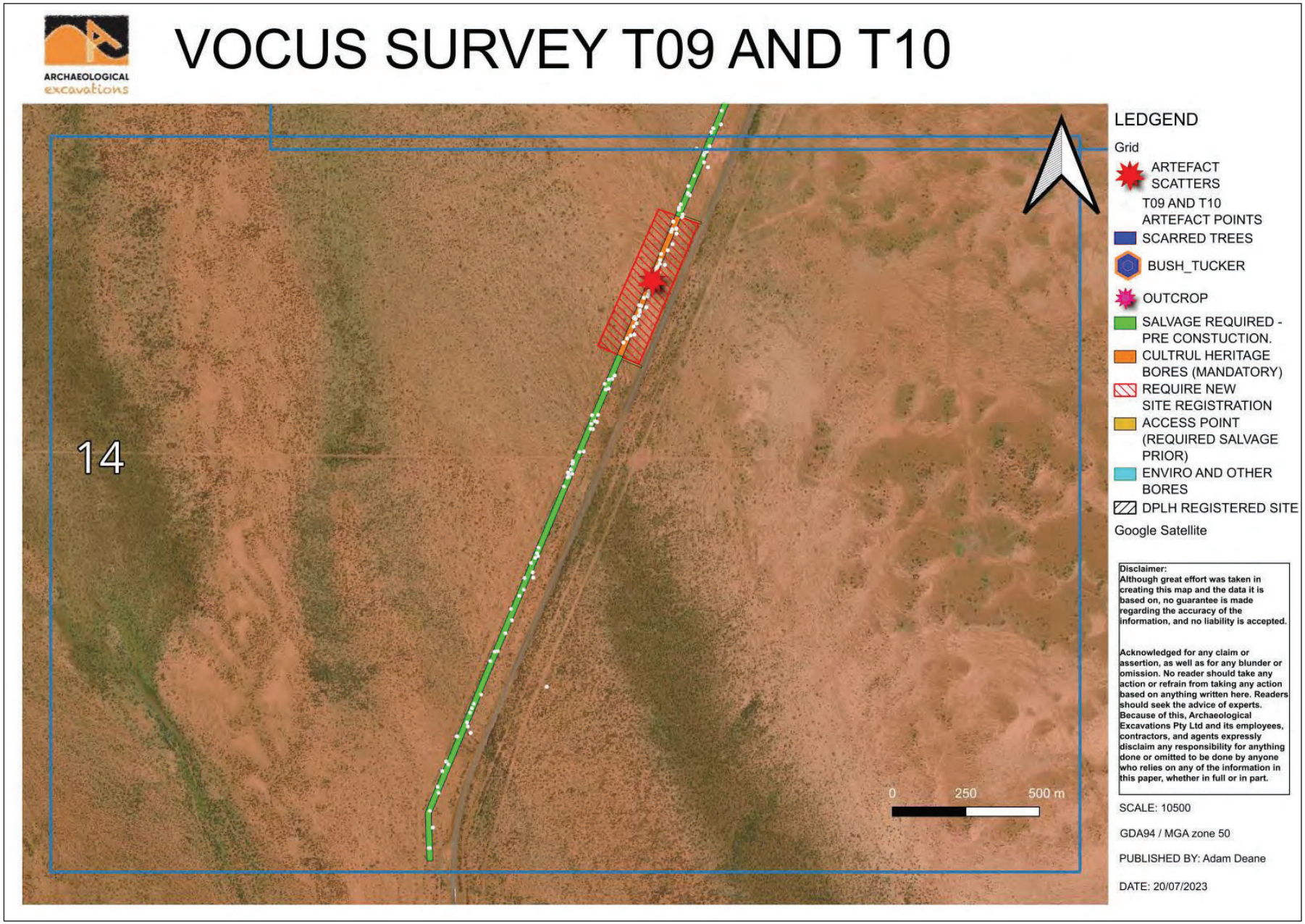
Map 17 - Project Horizon T09 and T10 Results and Recommendations 12 of 32.

VOCUS SURVEY T09 AND T10

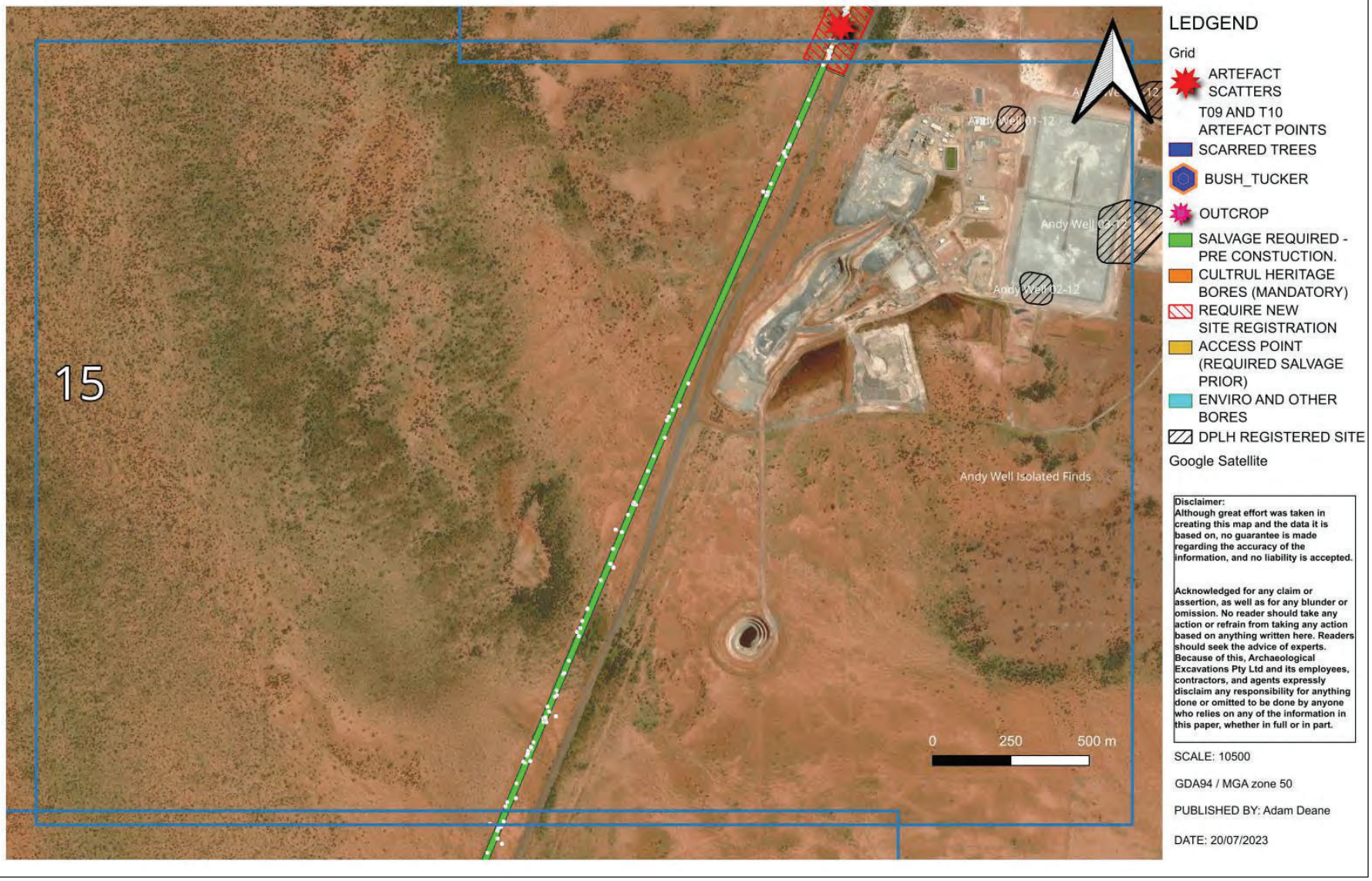


Map 18 - Project Horizon T09 and T10 Results and Recommendations 13 of 32.



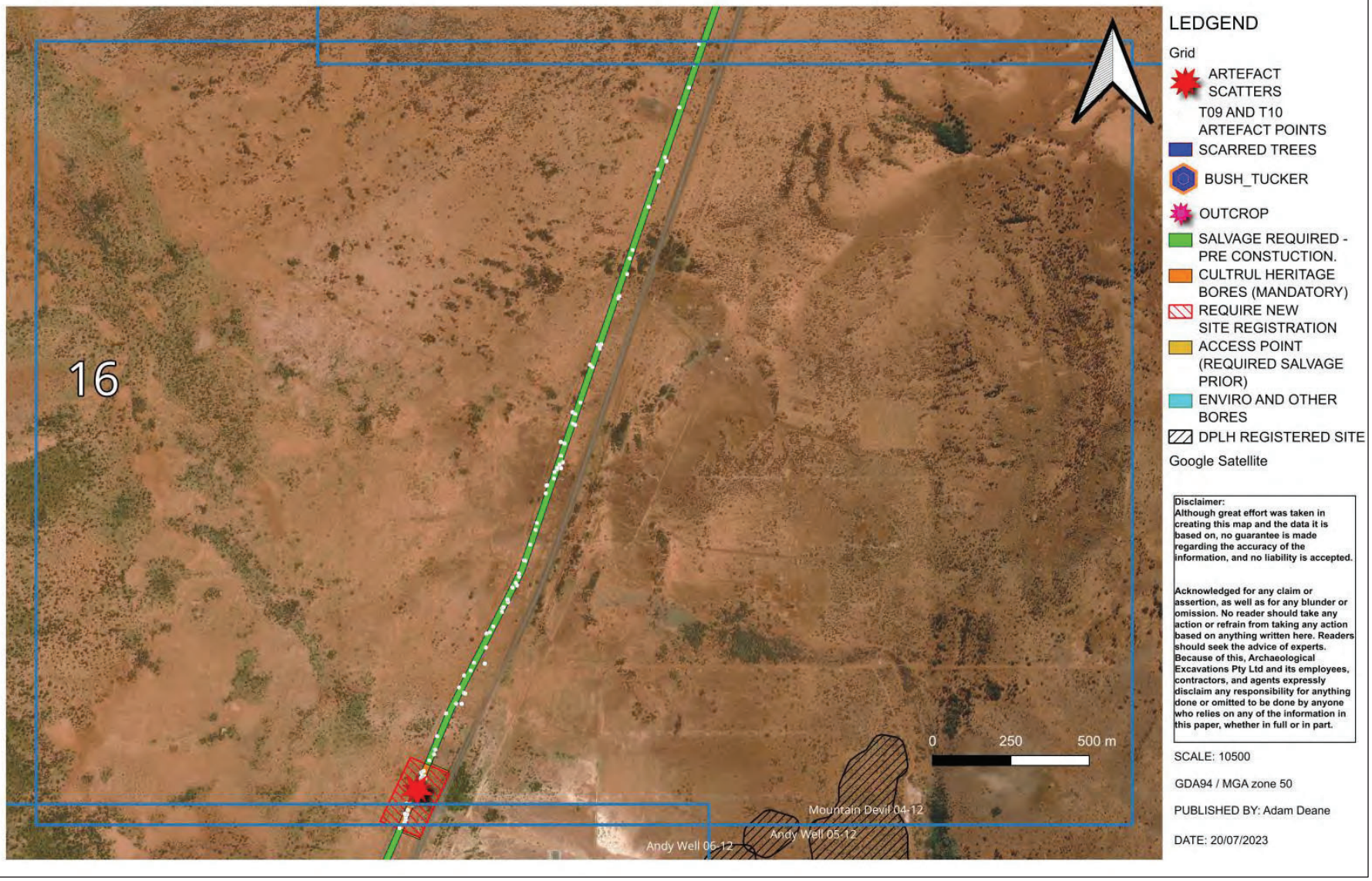
Map 19 - Project Horizon T09 and T10 Results and Recommendations 14 of 32.

VOCUS SURVEY T09 AND T10



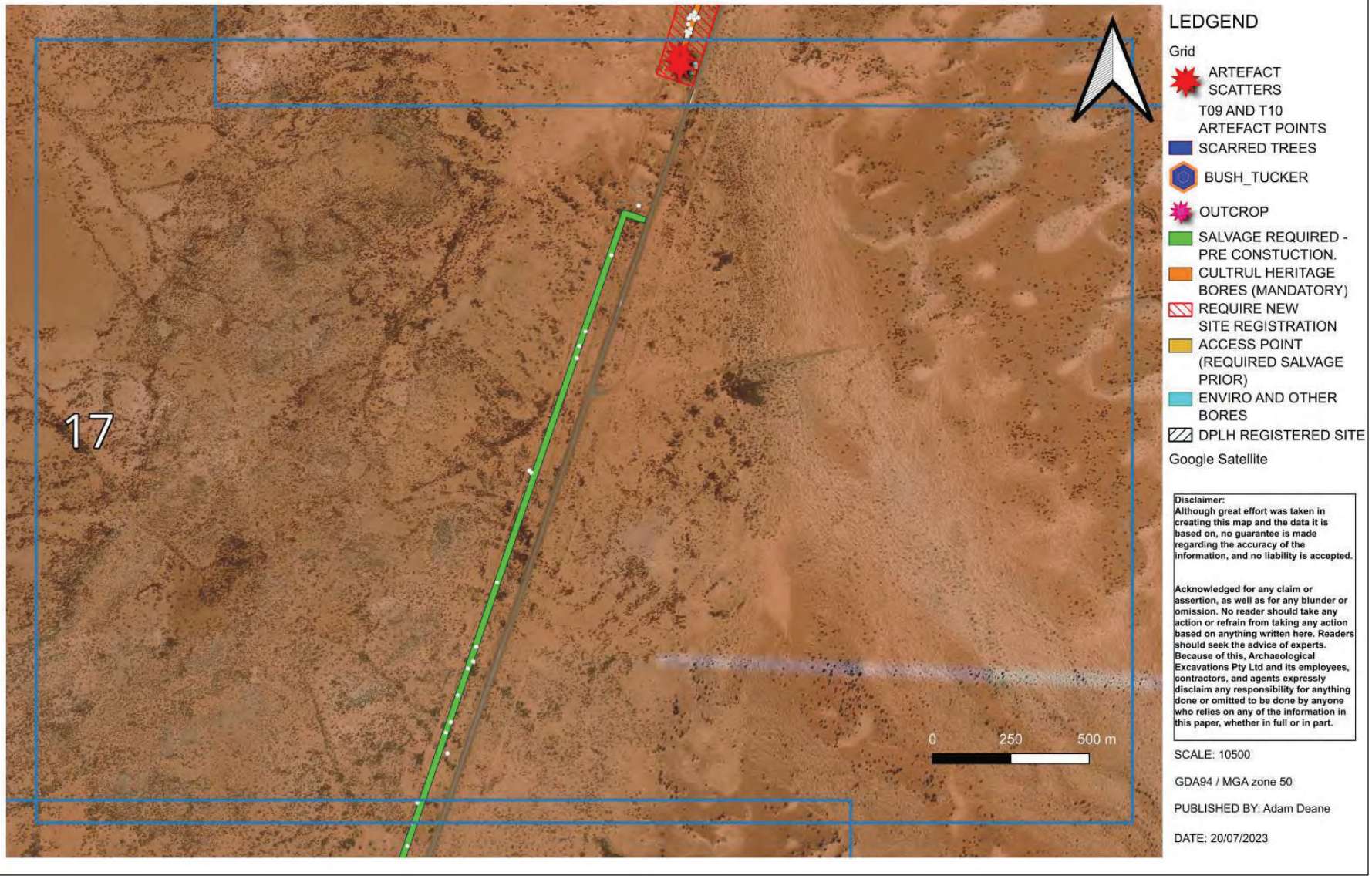
Map 20 - Project Horizon T09 and T10 Results and Recommendations 15 of 32.

VOCUS SURVEY T09 AND T10

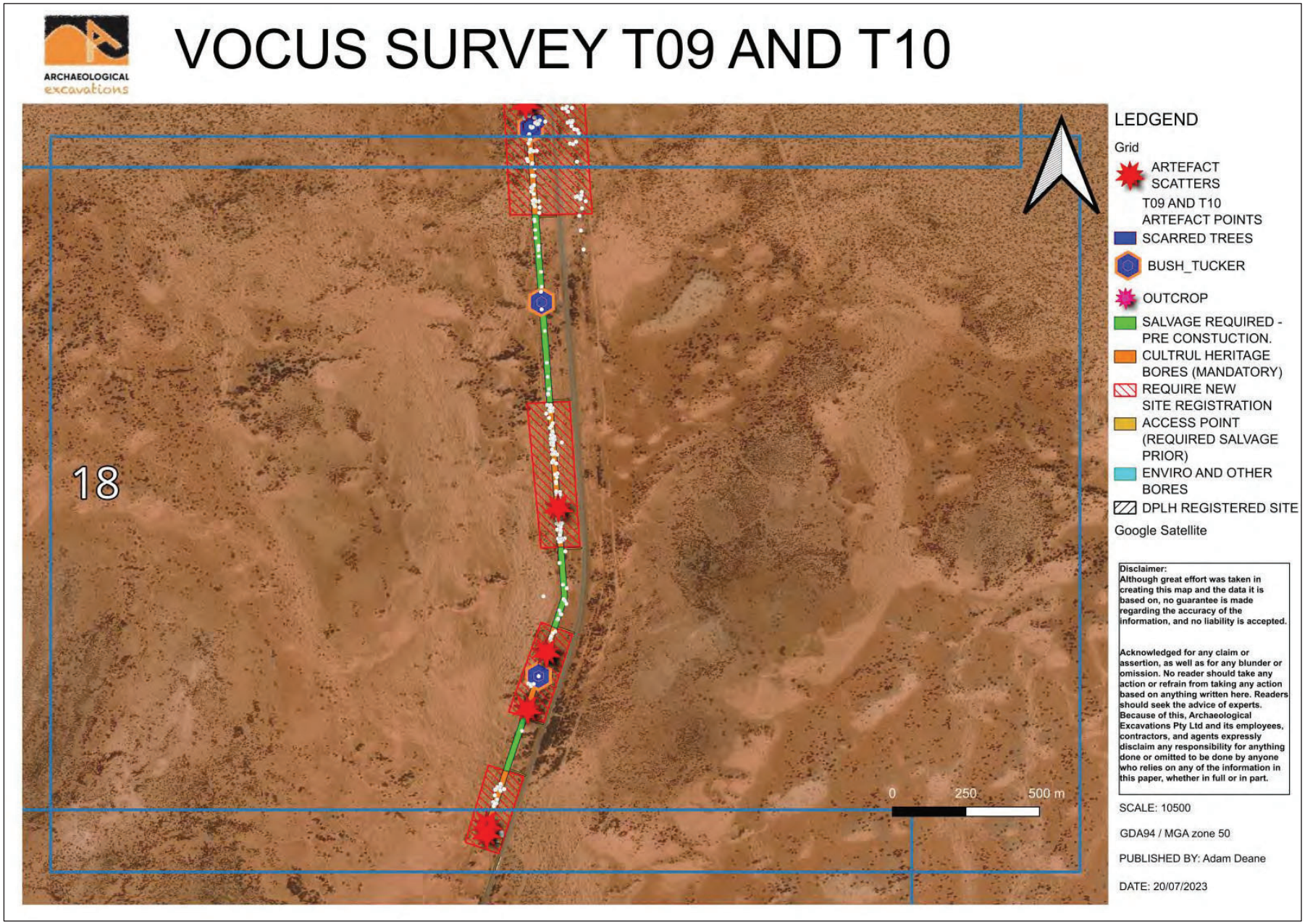


Map 21 - Project Horizon T09 and T10 Results and Recommendations 16 of 32.

VOCUS SURVEY T09 AND T10

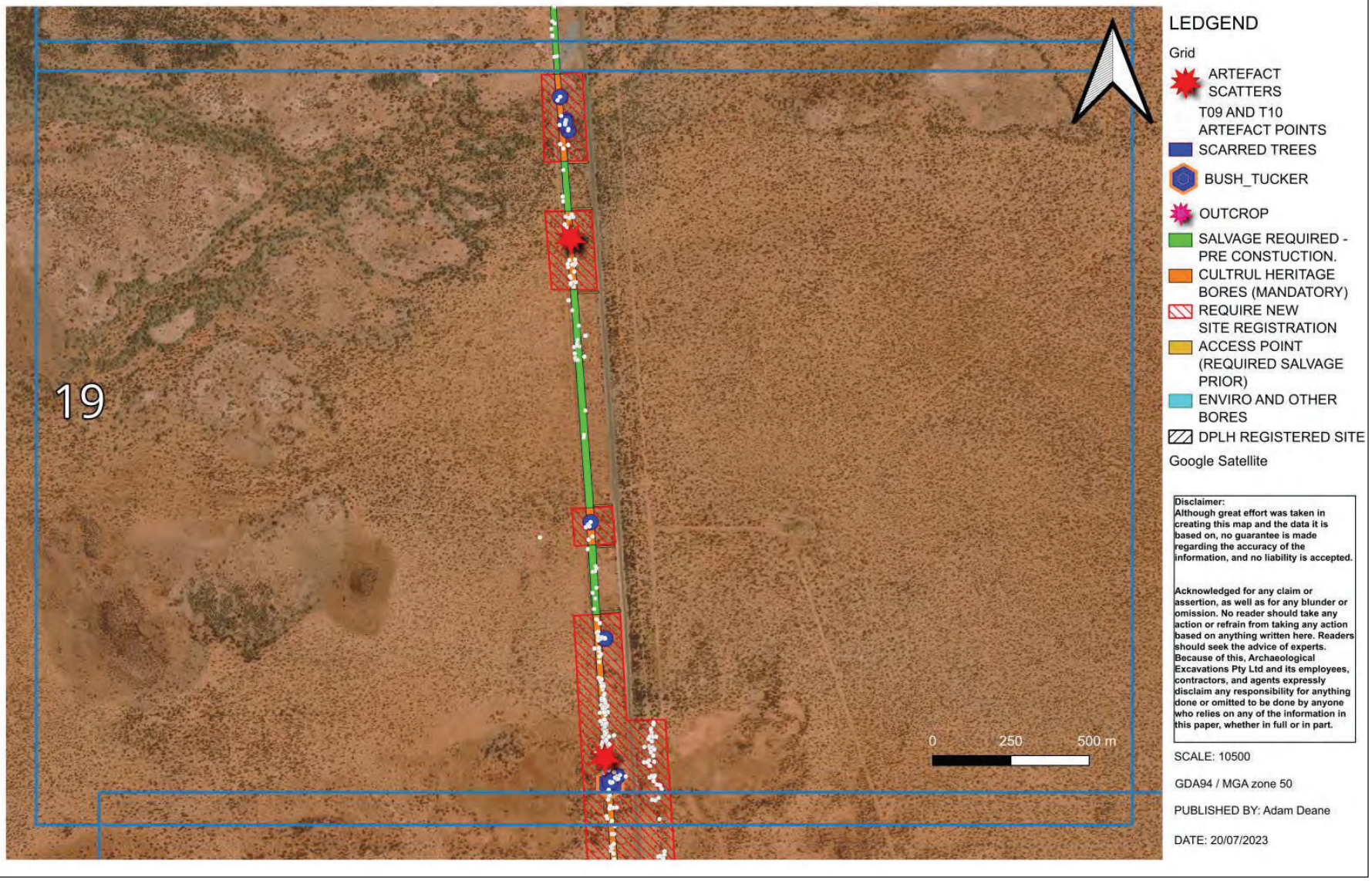


Map 22 - Project Horizon T09 and T10 Results and Recommendations 17 of 32.



Map 23 - Project Horizon T09 and T10 Results and Recommendations 18 of 32.

VOCUS SURVEY T09 AND T10



Map 24 - Project Horizon T09 and T10 Results and Recommendations 19 of 32.

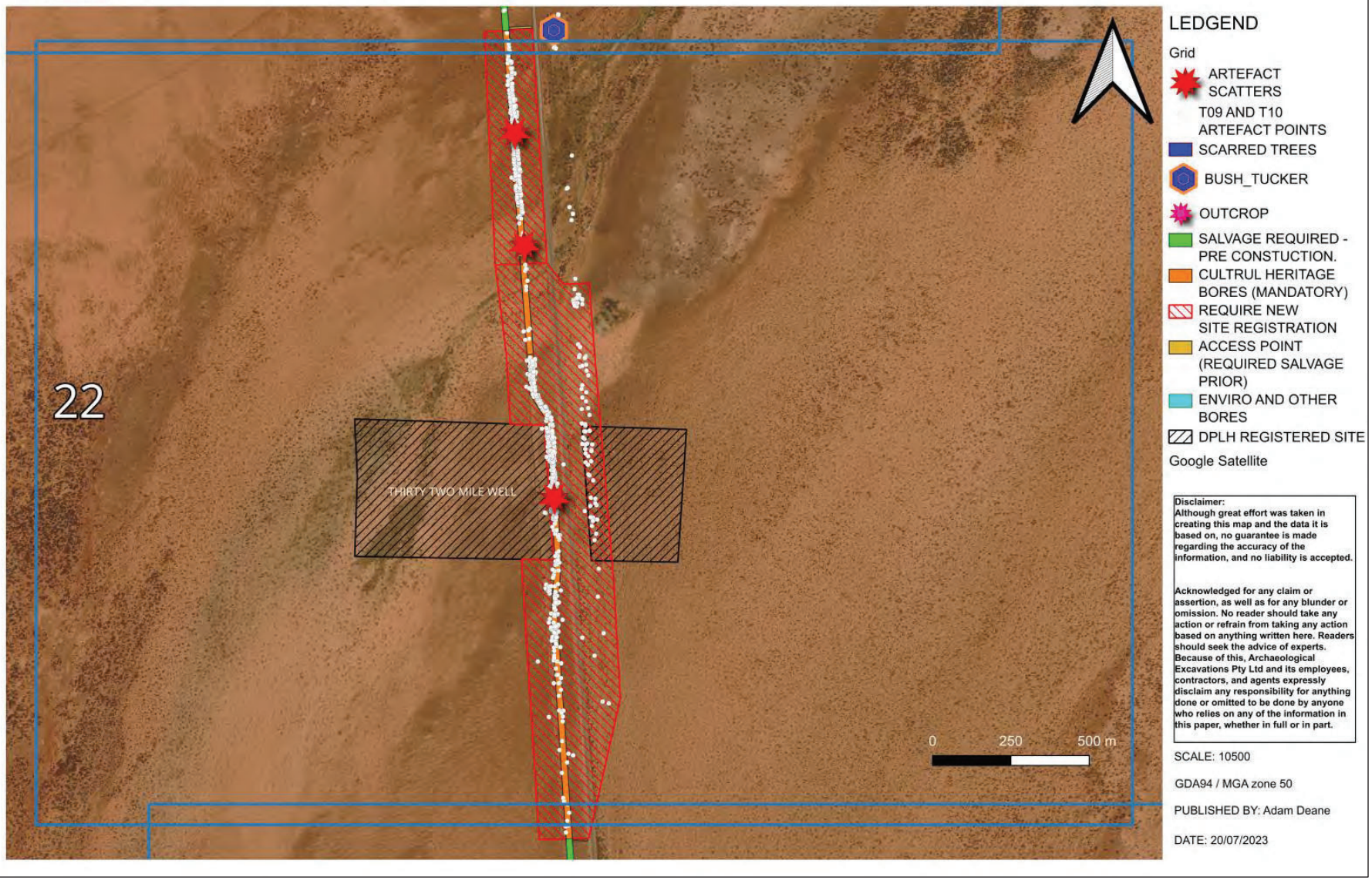
VOCUS SURVEY T09 AND T10

Map 25 - Project Horizon T09 and T10 Results and Recommendations 20 of 32.

VOCUS SURVEY T09 AND T10

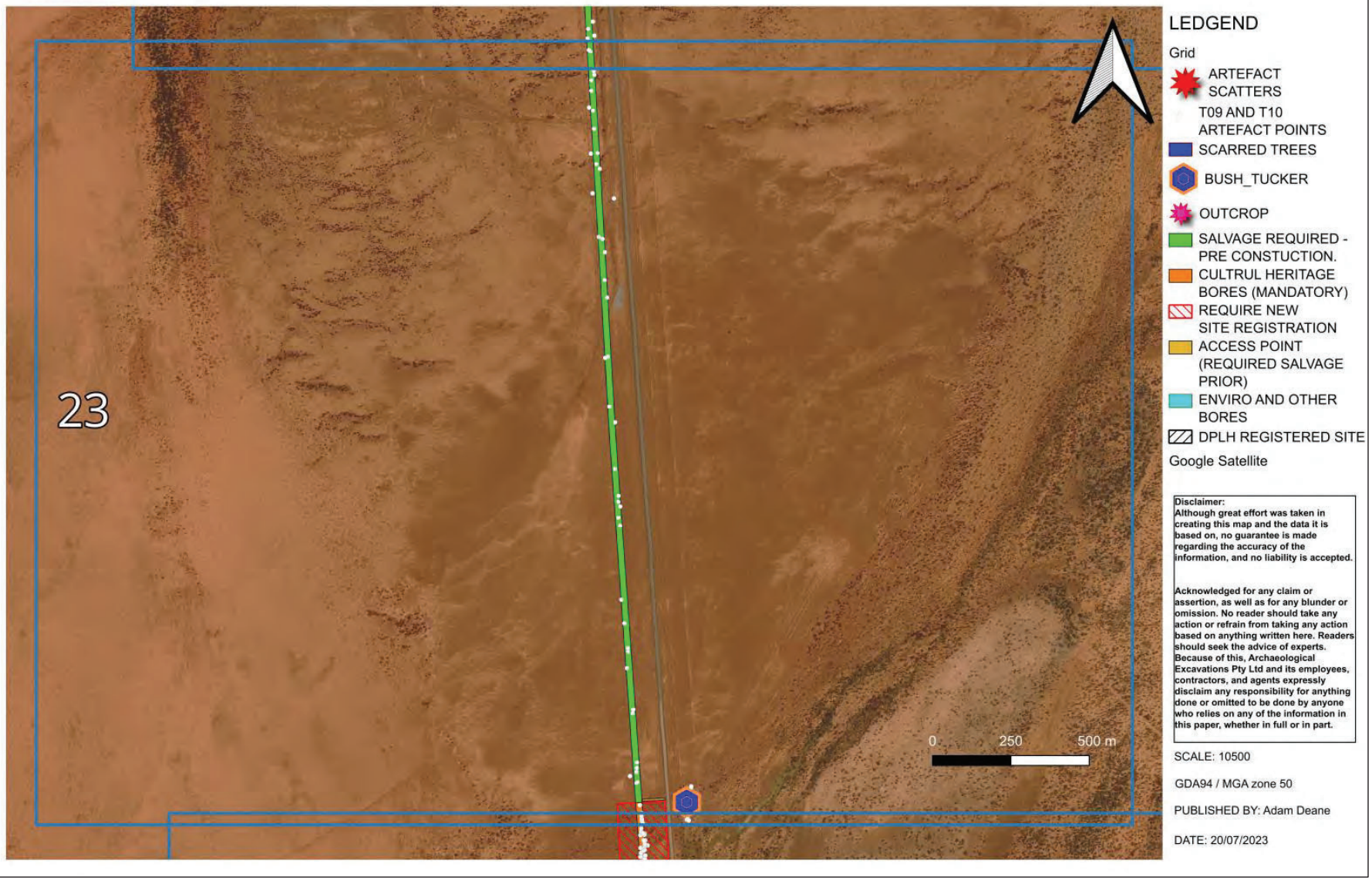
Map 26 - Project Horizon T09 and T10 Results and Recommendations 21 of 32.

VOCUS SURVEY T09 AND T10



Map 27 - Project Horizon T09 and T10 Results and Recommendations 22 of 32.

VOCUS SURVEY T09 AND T10

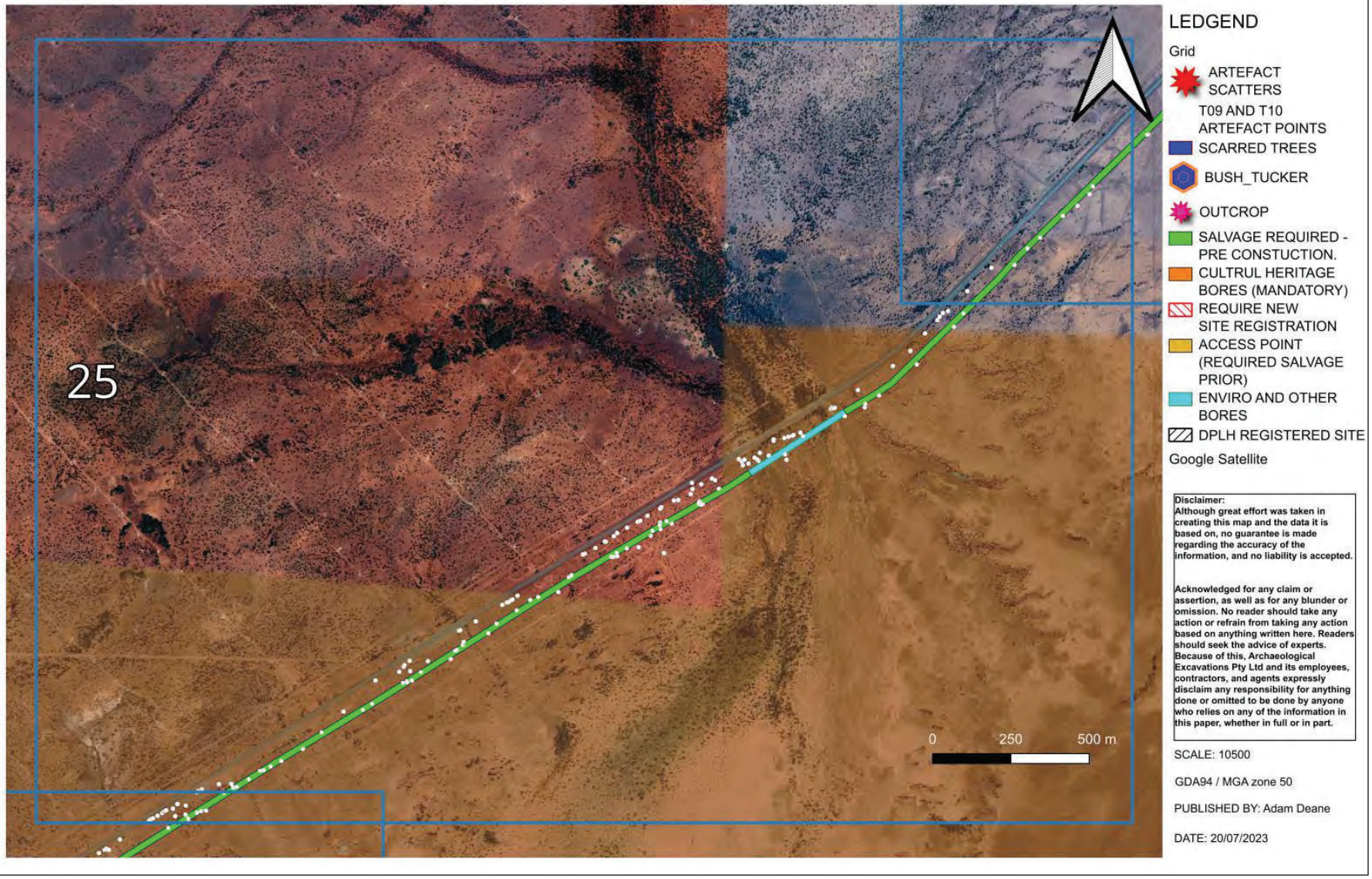


Map 28 - Project Horizon T09 and T10 Results and Recommendations 23 of 32.

VOCUS SURVEY T09 AND T10

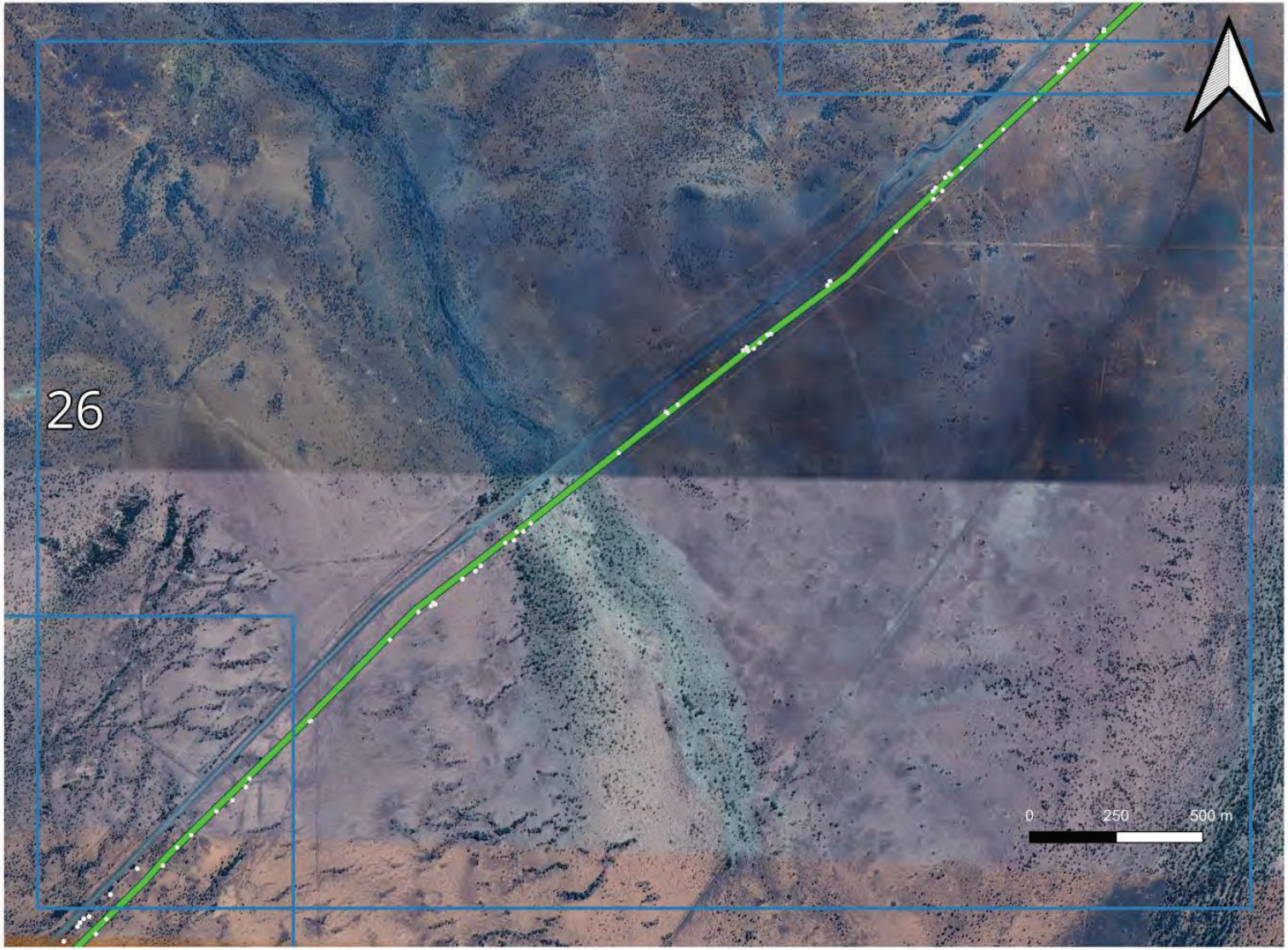
Map 29 - Project Horizon T09 and T10 Results and Recommendations 24 of 32.

VOCUS SURVEY T09 AND T10



Map 30 - Project Horizon T09 and T10 Results and Recommendations 25 of 32.

VOCUS SURVEY T09 AND T10



LEDGEND

Grid

ARTEFACT SCATTERS

T09 AND T10 ARTEFACT POINTS

SCARRED TREES

BUSH_TUCKER

OUTCROP

SALVAGE REQUIRED - PRE CONSTUCTION.

CULTRUL HERITAGE BORES (MANDATORY)

REQUIRE NEW SITE REGISTRATION

ACCESS POINT (REQUIRED SALVAGE PRIOR)

ENVIRO AND OTHER BORES

DPLH REGISTERED SITE

Google Satellite

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SCALE: 10500

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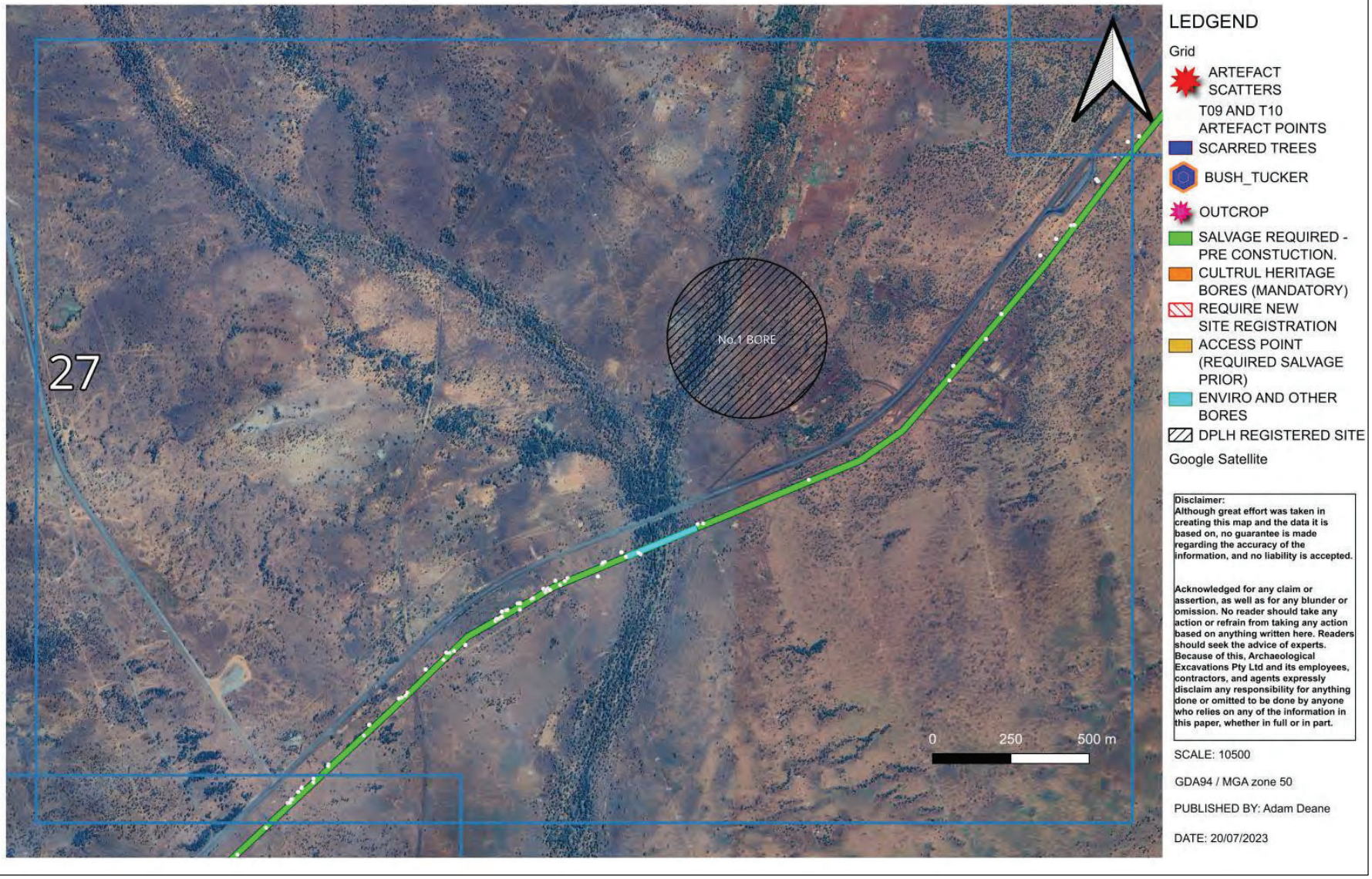
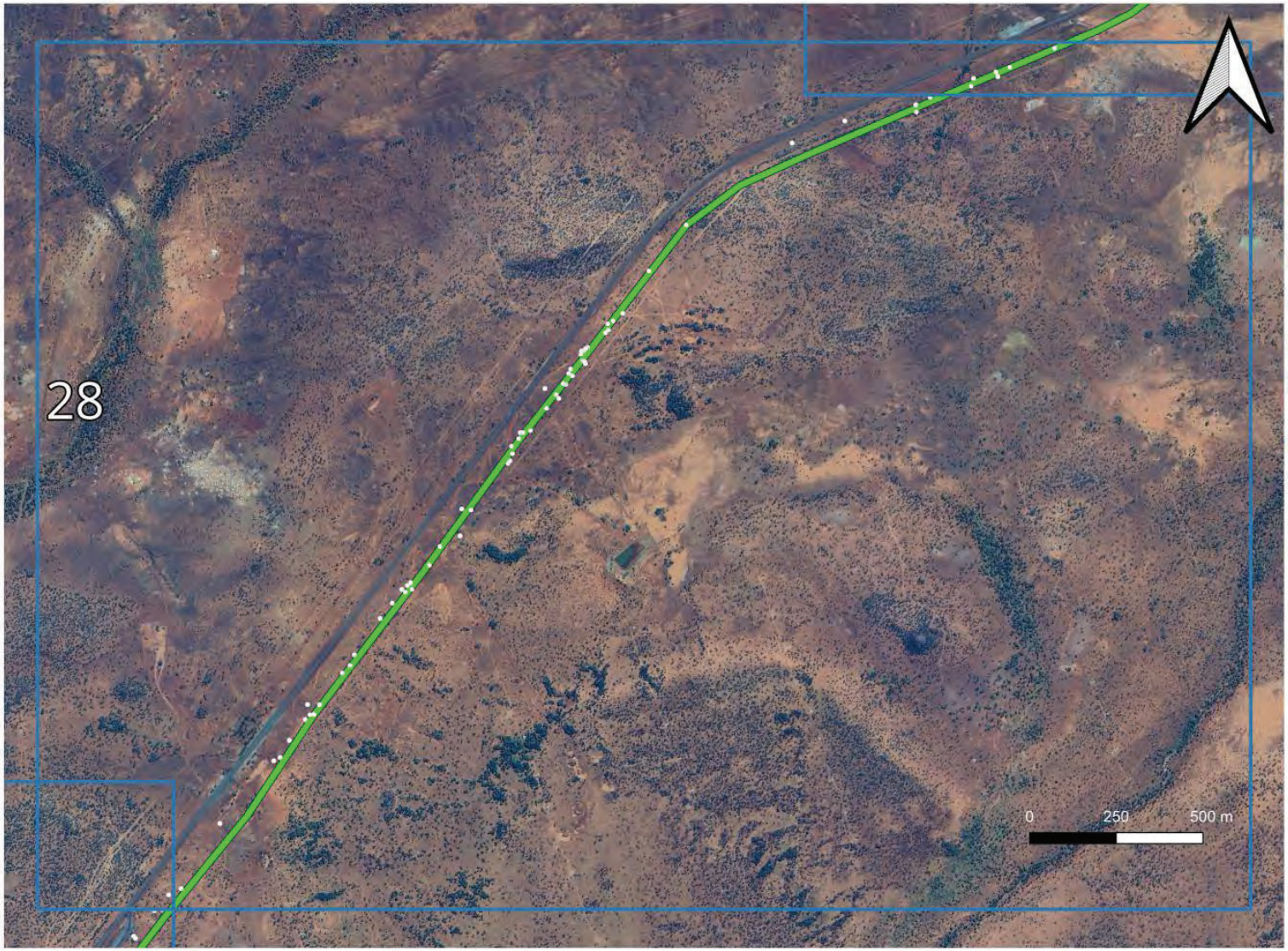
Map 31 - Project Horizon T09 and T10 Results and Recommendations 26 of 32.

VOCUS SURVEY T09 AND T10



Map 32 - Project Horizon T09 and T10 Results and Recommendations 27 of 32.

VOCUS SURVEY T09 AND T10



LEDGEND

Grid

ARTEFACT SCATTERS

T09 AND T10 ARTEFACT POINTS

SCARRED TREES

BUSH_TUCKER

OUTCROP

SALVAGE REQUIRED - PRE CONSTUCTION.

CULTRUL HERITAGE BORES (MANDATORY)

REQUIRE NEW SITE REGISTRATION

ACCESS POINT (REQUIRED SALVAGE PRIOR)

ENVIRO AND OTHER BORES

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SCALE: 10500

GDA94 / MGA zone 50

PUBLISHED BY: Adam Deane

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Map 33 - Project Horizon T09 and T10 Results and Recommendations 28 of 32.

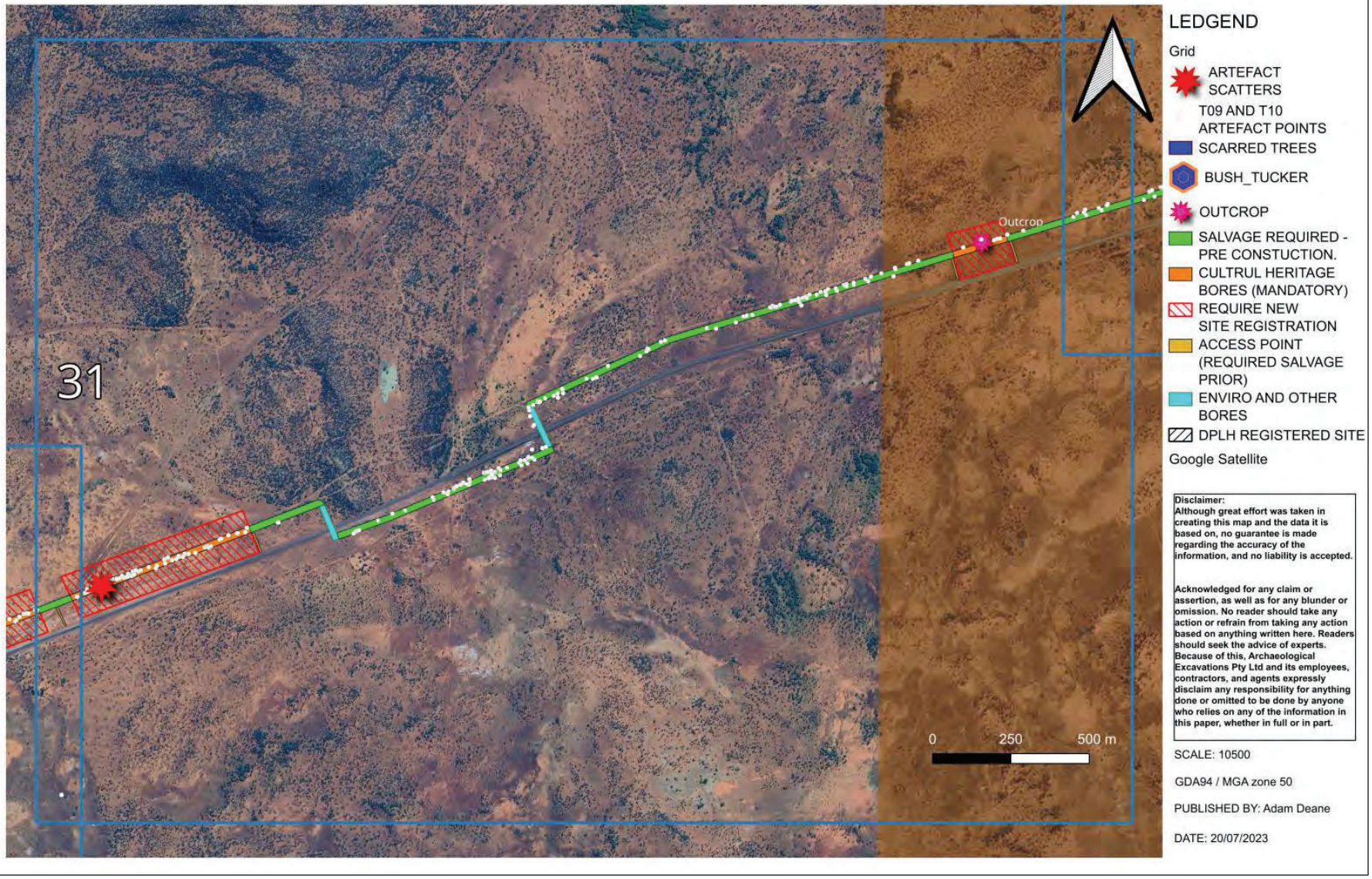
VOCUS SURVEY T09 AND T10

Map 34 - Project Horizon T09 and T10 Results and Recommendations 29 of 32.

VOCUS SURVEY T09 AND T10

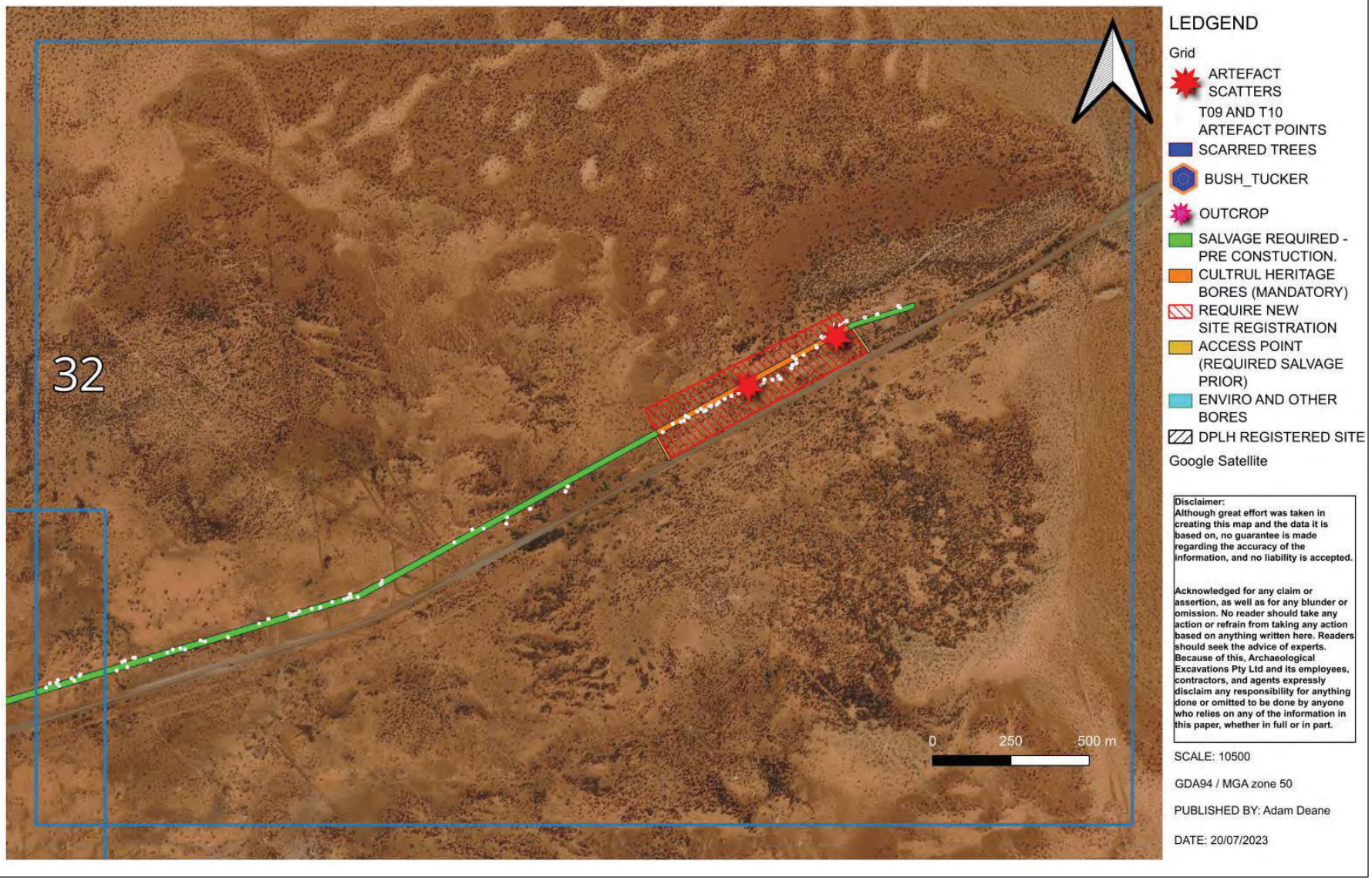
Map 35 - Project Horizon T09 and T10 Results and Recommendations 30 of 32.

VOCUS SURVEY T09 AND T10



Map 36 - Project Horizon T09 and T10 Results and Recommendations 31 of 32.

VOCUS SURVEY T09 AND T10



Map 37 - Project Horizon T09 and T10 Results and Recommendations 32 of 32.

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