West Wyalong Solar Farm

Heritage Management Plan

Report to Lightsource bp
July 2020

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artefact

Artefact Heritage
ABN 73 144 973 526
Suite 56, Jones Bay Wharf
26-32 Pirrama Road
Pyrmont NSW 2009
Australia

+61 2 9518 8411
office@artefact.net.au

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1.0 PREFACE

The main content of this document was provided to Lightsource bp in 2020 to fulfil DPIE (now DPE) requirements for a Heritage Management Plan (HMP) to incorporate recommendations of an Aboriginal Cultural Heritage Assessment Report (ACHAR) previously supplied by Artefact Heritage to Lightsource Development Services Australia Pty Ltd for the management of Aboriginal cultural heritage values at the West Wyalong Solar Farm, West Wyalong, NSW. [1]

Since the issue of this HMP in 2020, events at the West Wyalong Solar Farm have resulted in the commitment by PCL Constructions Pacific Rim Pty Ltd (PCL) (a contractor to Lightsource bp at the West Wyalong Solar Farm) to the Department of Planning and Environment for Enforceable Undertakings under Section 9.5 of the *Environmental Planning and Assessment Act 1979* (NSW).

These Enforceable Undertakings relate to actions required of PCL to redress, mitigate and manage the results of unwitting impacts by PCL, in contravention of the HMP, to two registered Aboriginal sites within the West Wyalong Solar Farm. These are:

- WWSF Bee Tree, AHIMS Site ID 43-4-0058
- WWSF AS01 Artefact Scatter, AHIMS ID 43-4-0057

As the HMP is a document assessed and formally approved by DPIE (DPE), it is not considered appropriate to insert into its body new management procedures as defined in the Enforceable Undertakings. Further, the Enforceable Undertakings are set out in a self-contained and self-explanatory document that has been assessed and approved by DPE. It is not considered appropriate to extract items from the Enforceable Undertakings for inclusion here.

Therefore, the Enforceable Undertakings have been incorporated here in Appendix 7as an addendum to this HMP. The Enforceable Undertakings must be read together with the HMP and the ACHAR (Artefact Heritage 2020), the collective recommendations of which must apply to works and activities both at the West Wyalong Solar Farm, and where stipulated, beyond the boundaries of the West Wyalong Solar Farm.

[1] Artefact Heritage 2019, West Wyalong Solar Farm Aboriginal Cultural Heritage Assessment Report. Report to Lightsource Development Services Australia Pty Ltd

2.0 INTRODUCTION

Lightsource bp was granted Development Consent on 28 November 2019 to construct and operate a solar farm approximately 16 kilometres (km) northeast of West Wyalong, in the Bland Shire local government area. The West Wyalong Solar Farm ('the Project') signifies an important contribution to Australia's renewable energy supply.

This Heritage Management Plan (HMP) describes how heritage management and mitigation measures will be implemented prior to and during the Project's construction and operation and documents how the conditions of the Development Consent and the requirements of the Aboriginal Cultural Heritage Assessment Report (ACHAR) have and will be met.

This HMP has been prepared to address conditions 19 and 20 of the Development Consent[2] for the Project. Table 1 identifies where each requirement is addressed in this plan.

Following the Secretary's approval, the Applicant must implement the HMP.

The implementation of this HMP is dependent on obtaining a Care Agreement for identified Aboriginal heritage items in the Project. No construction will occur for the project until a Care Agreement has been obtained.

Table 1: Condition of consent requirements

Condition requirement	Location in this document
Development Consent Schedule 3	
Item 19 Protection of Heritage Items	
The Applicant must ensure the development does not cause any direct or indirect impacts on the Aboriginal heritage items identified in Table 1 of Appendix 3 or located outside the approved development footprint. Prior to carrying out any development that could directly or indirectly impact the heritage items identified in Table 2 of Appendix 3, the Applicant must salvage and relocate the item/s that would be impacted and obtain a Care Agreement for the transfer and safekeeping of artefacts to the West Wyalong Local Aboriginal Land Council	Measures for salvage, relocation and Care Agreement for identified Aboriginal heritage items artefacts are located in Section 7.1.1.1 and 7.1.1.2 of this document. Copy of approved Care Agreement is provided in Appendix 1
Item 20 Heritage Management Plan	
Prior to commencing construction, the Applicant must prepare a Heritage Management Plan for the development to the satisfaction of the Secretary. This plan must:	
(a) be prepared by suitably qualified and experienced persons whose appointment has been endorsed by the Secretary	See Appendix 2
(b) be prepared in consultation with BCD and Aboriginal Stakeholders;	See Section 3.3

[2] Development Consent for Application Number SSD 9504 under Section 4.38 of the *Environmental Planning & Assessment Act* 1979. Issued 28 November 2019.

Condition requirement	Location in this document
(c) include a description of the measures that would be implemented for:	
• protecting the Aboriginal heritage items identified in Table 1 of Appendix 3 or outside the approved development footprint, including fencing off the Aboriginal heritage items prior to commencing construction;	• See Section 7.1.1.3
• salvaging and relocating the Aboriginal heritage items located within the approved development footprint, as identified in Table 2 of Appendix 3;	• See Section 7.1.1.1 and 7.1.1.2
• a contingency plan and reporting procedure if: -previously unidentified heritage items are found; or	- See Section 7.2.2 and Appendix 3
- Aboriginal skeletal material is discovered;	-See Section 7.2.3 and Appendix 3
• ensuring workers on site receive suitable heritage inductions prior to carrying out any development on site, and that records are kept of these inductions; and	• See Section 7.2.1
• ongoing consultation with Aboriginal stakeholders during the implementation of the plan;	• See Section 7.1.2.6
(d) include a program to monitor and report on the effectiveness of these measures and any heritage impacts of the Project.	(d) See Section 7.1.3, Section 7.1.4, Section 7.1.2.3 and Section 7.1.2.2

2.1 Project overview

The Project involves the construction, operation and eventually decommissioning of a solar farm with a generating capacity of approximately 90 megawatts (MW) and 50 MW/90 MW-hour (MWh) of battery storage.

The main components of the Project include:

- approximately 296,000 single-axis tracking solar panels (up to 4.1 m high) and 15 inverter stations;
- 30 lithium-ion battery units with a total capacity of 50 MW/90 MWh (to be constructed at a later date);
- an on-site substation and connection to Essential Energy's 132 kV transmission line via overhead or underground transmission lines along Myers Lane;
- a monitoring house and two storage sheds;

- landscape screening; and
- internal access tracks, car parking and security fencing.

During operation of the solar farm, the ground cover and landscape screening would be properly maintained with appropriate species and weed management. Sheep grazing, where practicable, would be undertaken on the site during operation to manage ground cover.

The expected operational life of the infrastructure is approximately 30 years. However, the Project may involve infrastructure upgrades that could extend the operational life.

The Project is located on a 562 hectare (ha) property in Wyalong on the northern fringes of the Riverina Murray region in of NSW (Figure 1). The development footprint of the Project is 211 ha and was designed to avoid site constraints, including native vegetation, Aboriginal heritage items of high significance and a watercourse in the north of the Project area. Site entry would be via new access point on Blands Lane. The approved general layout of the solar farm is shown in Figure 2 below.

The location of Aboriginal sites is considered culturally sensitive information. It is advised that the locations of Aboriginal sites must be removed from Figures in this HMP if it is to enter the public domain. It is for this reason that it is not considered appropriate for the proposed No Go Zone fencing to closely surround the location of Aboriginal sites as such close fencing would identify and draw attention to the location of such sites.

Figure 1: Project area location

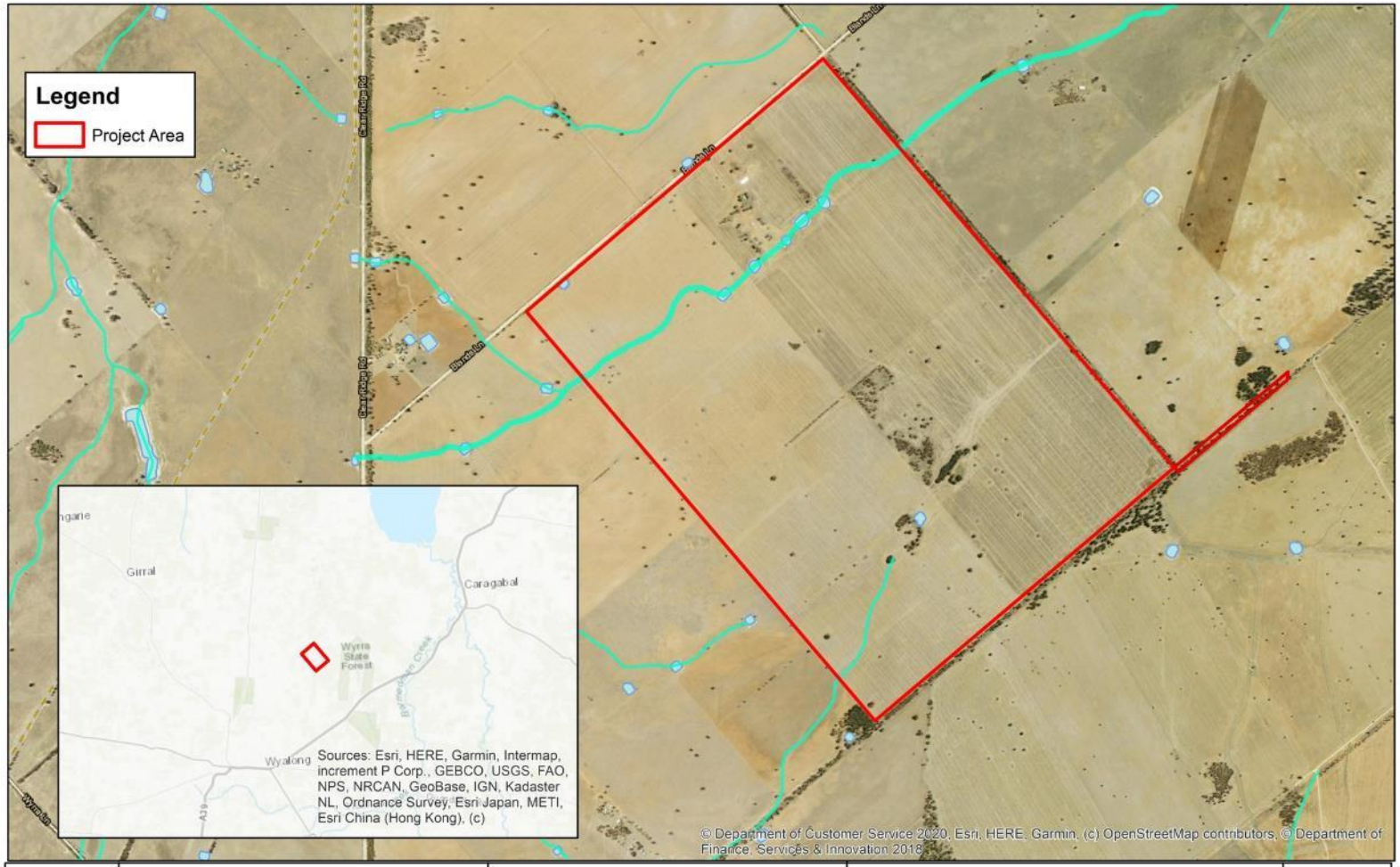

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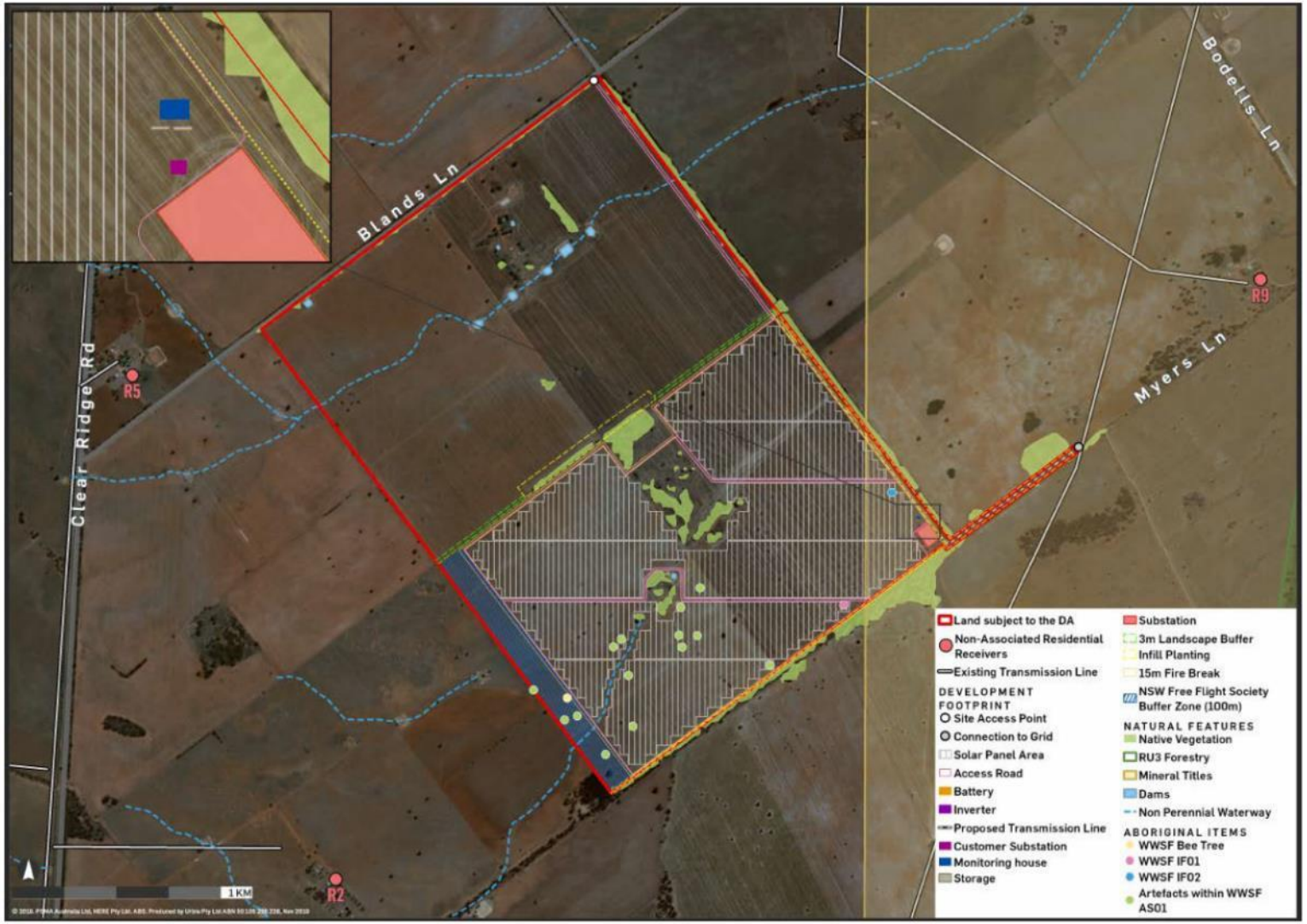
Figure 2: General layout of the Project as identified in the development consent



2.2 The Proponent

The proponent for the Project is Lightsource bp. Lightsource bp will engage an Engineering, Procurement and Construction (EPC) contractor to construct the Project and an Operation and Maintenance (O&M) contractor to manage the operation of the Project.

2.3 Authorship

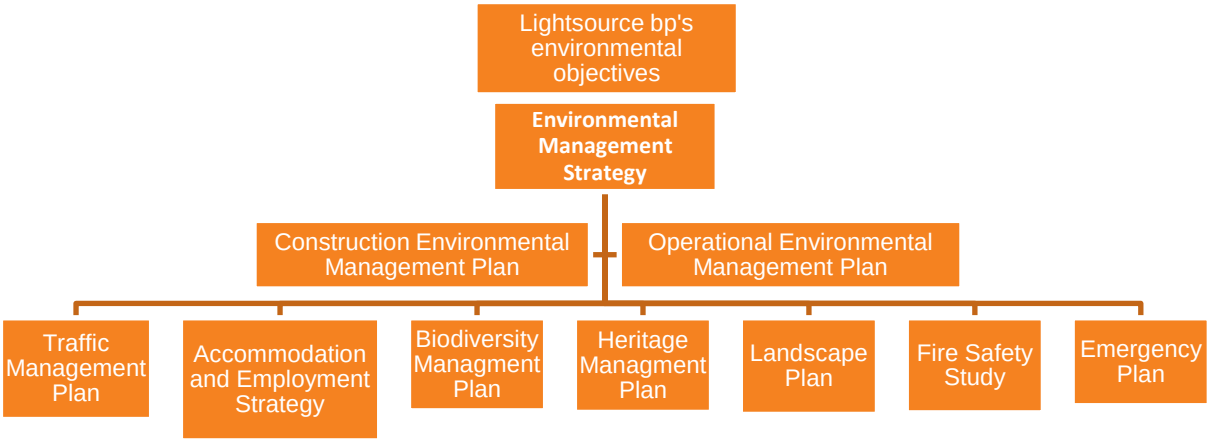
This management plan has been written by Michael Lever (Senior Heritage Consultant, Artefact Heritage). Verification of Michael's capacity to author heritage management plans is provided in Appendix 2. Dr Sandra Wallace (Director, Artefact Heritage) provided management and review.

2.4 Related documents

This HMP is part of the environmental management system for the Project which is based on a hierarchy of documents. The environmental management system follows Lightsource bp's environmental objectives and management processes.

The Environmental Management Strategy (EMS) is the overarching document for the Project in the system that includes a number of management documents. The purpose of the EMS is to provide a framework for compliance with the Conditions of Consent and the management of environmental issues associated with the Project. A flowchart of the documents in the environmental management system is shown in Figure 2 below. Additional to items shown in Figure 3 will be the preparation and implementation of a Fire Safety Study subsequent to the future construction onsite of a battery storage facility.

Figure 3: Flow chart of environmental management system



2.5 Project location detail

The Project consists of two rural lots (Lot 17 and Lot 18 in DP753081) at 228- 230 Blands Lane, West Wyalong comprising a total of 560 hectares (ha). The Project is fronted by Blands Lane to the north. It is located within the Bland Shire Local Government Area (Bland Shire LGA) within the Parish of Clear

Ridge and County of Gipps. It is contained within the boundary of West Wyalong Local Aboriginal Land Council (West Wyalong LALC).

2.6 Heritage approvals

2.6.1 *Environmental Planning and Assessment Act 1979*

Part 4, Division 4.7 of the *Environmental Planning & Assessment Act 1979* (EP&A Act) specifies that any State environmental policy may declare any development to be State significant development (SSD) as can the Minister, by a Ministerial planning order.

Under Part 4, Division 4.7, section 4.41 the following authorizations are not required for SSD that is authorized by a development consent granted after the commencement of this Division (and accordingly the provisions of any Act that prohibit an activity without such an authority do not apply):

1 (c) an approval under Part 4, or an excavation permit under section 139, of the *Heritage Act 1977*

1 (d) an Aboriginal heritage impact permit under section 90 of the *National Parks and Wildlife Act 1974* (NPW Act)

The State Environmental Planning Policy (State and Regional Development) 2011 (Part 2 (11)) also excludes the application of development control plans for SSD.

Under Part 5, Division 5.1 (environmental impact assessment) the determining authority cannot carry out an activity or grant approval for an activity that is likely to significantly affect the environment unless an environmental impact statement is prepared.

The proposed development was assessed under Part 4 of the EP&A Act. As such, agency heritage approvals under the NPW Act were not required.

Aboriginal Cultural Heritage Assessment Report

An Aboriginal Cultural Heritage Assessment Report (ACHAR)[3] was prepared for the Project EIS in accordance with the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH, 2010a). The ACHAR included:

- Comprehensive Aboriginal stakeholder consultation in accordance with the requirements of Aboriginal Cultural Heritage Consultation Requirements for Proponents (OEH, 2010b)
- An assessment of Aboriginal cultural heritage values and the significance of the potential archaeological deposit
- Survey of the Project site
- An assessment of the potential harm to Aboriginal cultural heritage values due to the Project
- Recommendations for mitigation and management of harm to Aboriginal cultural heritage values due to the Project

[3] Artefact Heritage (February 2016) West Wyalong Solar Farm Aboriginal Cultural Heritage Assessment Report. Report to Lightsource Development Services Australia Pty Ltd. Bland Shire Local Government Area.

2.7 Purpose and objectives

2.7.1 Purpose

The purpose of this plan is to describe how Aboriginal heritage will be protected and managed during construction and operation of the Project.

2.7.2 Objectives

The objective of the HMP is to ensure that impacts to Aboriginal heritage are minimised and limited to the scope permitted by the planning approval for the Project. To achieve this the following will be undertaken:

- Ensure mitigation measures related to the salvage and recording of Aboriginal heritage are implemented prior to impacts.
- Ensure appropriate measures are implemented to comply with the Conditions of Consent and ACHAR.

3.0 CONSULTATION AND STAKEHOLDER ENGAGEMENT

3.1 Registered Aboriginal Parties

Consultation with Registered Aboriginal Parties (RAPs) was undertaken during the preparation of the ACHAR for the Project in accordance with OEH's guidelines 'Aboriginal cultural heritage consultation requirements for proponents' (2010).

In accordance with Step 4.1.2 of the Consultation Requirements, Artefact Heritage corresponded with the following organisations by letter and email on the 10 October 2018 requesting the details of Aboriginal people who may hold cultural knowledge relevant to determining the Aboriginal significance of Aboriginal objects and/or places within the local area:

- Riverina Local Land Services (LLS)
- Bland Shire Council
- Native Title Service Corporation
- West Wyalong LALC
- Office of Environment and Heritage
- National Native Title Tribunal
- Office of the Registrar, *Aboriginal Land Rights Act 1983*

In addition to this, and in accordance with Step 4.1.3 of the Consultation Requirements, an advertisement was placed in Koori Mail and the Leader (Wagga Wagga) Advertisements on the 17 October 2018, inviting the participation of Aboriginal people who may hold cultural knowledge relevant to determining the Aboriginal significance of Aboriginal objects and/or places within the local area.

In accordance with Step 4.1.3 of the Consultation Requirements, on the 29 October 2018, emails or letters were sent to all Aboriginal persons or organisations identified through advertisement or through responses from agencies contacted as part of Step 4.1.2. In accordance with Step 4.2 the letters provided details about the location and nature of the Project, as well as an invitation to register as an Aboriginal stakeholder.

As a result of that process four groups registered their interest (Table 2).

Table 2: List of Registered Aboriginal Parties

Contact	Organisation
Leeanne Hampton	West Wyalong LALC
Marnie Freeman	Young LALC
Norma Freeman	Young LALC

Contact	Organisation
Enid Clarke	Young LALC
Alona Apps	Young LALC
Krystal Ingram	Young LALC
Jirrah Freeman	Young LALC
Jahnayah Freeman	Young LALC
Keith Freeman	Young LALC
Mr Robert Clegg	Wiradjuri Council of Elders
Paul Boyd/ Lilly Carroll	Didge Ngunawal Clan

Following review by RAPs of the proposed survey methodology, archaeological survey was carried out by Artefact Heritage in conjunction with the West Wyalong LALC, over three days from 9 October to 11 October 2018. Participants in the survey are listed in

Table 3 below.

Table 3: Participants in field survey

Name	Organisation	Date of participation
Braydn Davis	West Wyalong LALC	9 October 2018
Linton Howarth	West Wyalong LALC	9 October to 11 October 2018
Jesse Hampton	West Wyalong LALC	10 to 11 October 2018
Lee Hampton	West Wyalong LALC	11 October 2018

3.2 Aboriginal Focus Group

All RAPs were invited to attend an Aboriginal Focus Group (AFG). Two AFGs were held on 11 December 2018. One AFG was held at the offices of the West Wyalong LALC and one AFG was held at the offices of the Young LALC.

The objective of the AFGs were to:

- Present the Project and discuss the archaeological assessment

- Gain an understanding of the cultural values of the Project site and surrounds
- Come to an agreement on the management and mitigation measures to be implemented
- Identify the next steps and timeframes

The attendees for both meetings are outlined in Table 4 and

Table 5 below.

Table 4: List of attendees at the AFG at West Wyalong LALC

Name	Organisation
Polly Baranco	Lightsource Development Services Australia
Michael Lever	Artefact Heritage
Anna Darby	Artefact Heritage
Aimee Davis	West Wyalong LALC
Linton Howarth	West Wyalong LALC

Table 5: List of attendees at the AFG at Young LALC

Name	Organisation
Polly Baranco	Lightsource Development Services Australia
Michael Lever	Artefact Heritage
Anna Darby	Artefact Heritage
Alona Apps	Young LALC
Norma Freeman	Young LALC

3.2.1 Results from RAP review of the ACHAR

Recommendations agreed upon with RAPs at the AFGs were incorporated into the ACHAR. A draft copy of the ACHAR was sent to RAPs on the 7 January 2019 for a 28-day review period, with comments requested by 4 February 2019. No comments were received from the RAPs in regard to the draft ACHAR.

3.3 RAP comments on the HMP

The HMP was provided to RAPs for review on 22 July 2020, with request for comments to be returned to Artefact Heritage by 28 August 2020. One RAP comment was received, this is itemised in Table 6 below.

Table 6: RAP comments on HMP and how addressed in this document

RAP	Date & method	Comment	How addressed in HMP
Robert Clegg – Wiradjuri Council of Elders	23/8/2020 email to M. Lever Artefact Heritage	This looks good to me, You have covered everything that was needed and I hope it all works out accordingly.	Incorporated to this table and consultation log

3.4 Ongoing RAP consultation

In accordance with the recommendations of the ACHAR, consultation and cooperation with the RAPs listed in Table 2 is required for the proposed artefact collection program. Consultation with RAPs must also be maintained through the construction program through provision of six-monthly progress updates in order to maintain currency of the consultation process.

3.5 Review of HMP by Heritage NSW, Department of Premier and Cabinet

The HMP was provided to Heritage NSW for review on 22 July 2020, via the Heritage Mailbox (heritagemailbox@environment.nsw.gov.au). Comments on the HMP were received from Heritage NSW on 14 September 2020. These comments have been integrated to the HMP as detailed in below. Copy of Heritage NSW email text in full is provided in Appendix 5.

Table 7: Heritage Division comments and how addressed in this document

Heritage Division Comment	How incorporated to HMP
Once the care agreement is issued it is to be implemented. A copy of the care agreement should be kept on file on site with the HMP.	Inserted verbatim to Section 7.1.1.2
Section 2.3 states this section will be updated following comments received from the Registered Aboriginal Parties on the draft HMP and how the comments have been addressed by the applicant. If comments have been received by RAPs these need to be incorporated into the HMP.	RAP comments have been provided in Section 2.3 Table 6.
Regarding section 6.1.2.2. Monitoring and Self Reporting - the Conditions of Development Consent Schedule 4 Compliance condition 4 sets out the incident notification process to the DPIE. Condition 5 sets out the non-compliance notification process to the DPIE. We recommend the HMP be updated to reflect the consent conditions to also notify DPIE.	Inserted to Section 7.1.2.2

4.0 LEGISLATIVE REQUIREMENTS

4.1 Legislation

This HMP has been prepared in accordance with the relevant legislative requirements, policies and procedural guidelines applicable to Aboriginal and non-Aboriginal heritage and its protection in New South Wales. These are summarised below:

Table 8: Summary of relevant legislation

Legislation	Description	Implication for this HMP
Environmental Planning and Assessment Act 1979	This Act establishes a system of environmental planning and assessment of development projects for the State.	Project approval conditions and obligations have been incorporated into the current HMP.
National Parks and Wildlife Act 1974	The NPW Act provides statutory protection to all Aboriginal places and 'objects'. In order to undertake a proposed activity which is likely to involve harm to an Aboriginal place or object, it is necessary to obtain an Aboriginal Heritage Impact Permit (AHIP), to be issued under Section 90 of the NPW Act.	Impacts to Aboriginal heritage items have been identified for the Project. Aboriginal heritage items to be directly impacted by the Project will be collected and stored under a Care Agreement to be sought from the Department of Premier and Cabinet NSW. The Project has been assessed as an SSD under Section 4.38 of the EP&A Act. An AHIP under the NPW Act is therefore not required. Aboriginal heritage items not salvaged will be protected from unintended impacts. Management of Aboriginal heritage is outlined in Section 7.1 of this plan.
Aboriginal Land Rights Act 1983	*The Aboriginal Land Rights Act 1983* is administered by the NSW Department of Human Services -Aboriginal Affairs. This Act established Aboriginal Land Councils (at State and Local levels). These bodies have a statutory obligation under the Act to; (a) take action to protect the culture and heritage of Aboriginal persons in the council's area, subject to any other law, and (b) promote awareness in the community of the culture and heritage of Aboriginal persons in the council's area.	The Project site is not subject to a claim under the *Aboriginal Land Rights Act 1983*. No specific implications for this HMP.

Legislation	Description	Implication for this HMP
	The Project site is within the boundary of the West Wyalong LALC.	
Native Title Act 1994	The *Native Title (New South Wales) Act 1994* was introduced to work in conjunction with the Commonwealth *Native Title Act 1993*. Native Title claims, registers and Indigenous Land Use Agreements are administered under the Act.	Native title has not been determined over the subject site. There are no active native title claims over the subject site. No specific implications for this HMP.

4.2 Guidelines

Several guidelines and standards relating to the management of Aboriginal and historic cultural heritage have been used as part of the assessment process. These include:

- Code of Practice for the archaeological investigation of Aboriginal objects in NSW (OEH 2010)
- Aboriginal cultural heritage consultation requirements for proponents 2010 (OEH 2010)
- Guide to investigating, assessing, and reporting on Aboriginal cultural heritage in NSW (OEH 2010)

5.0 EXISTING ENVIRONMENT

The existing environment and heritage context of the Project has been subject to assessment in the following background reports prepared to support the Project's Environmental Impact Statement (EIS):

- West Wyalong Solar Farm: Aboriginal Archaeological Survey Report. Report to Lightsource Development Services Australia, prepared by Artefact Heritage (November 2018).
- West Wyalong Solar Farm: Aboriginal Cultural Heritage Assessment Report. Report to Lightsource Development Services Australia, prepared by Artefact Heritage (March 2019).

5.1 Aboriginal heritage

5.1.1 Aboriginal archaeological resource

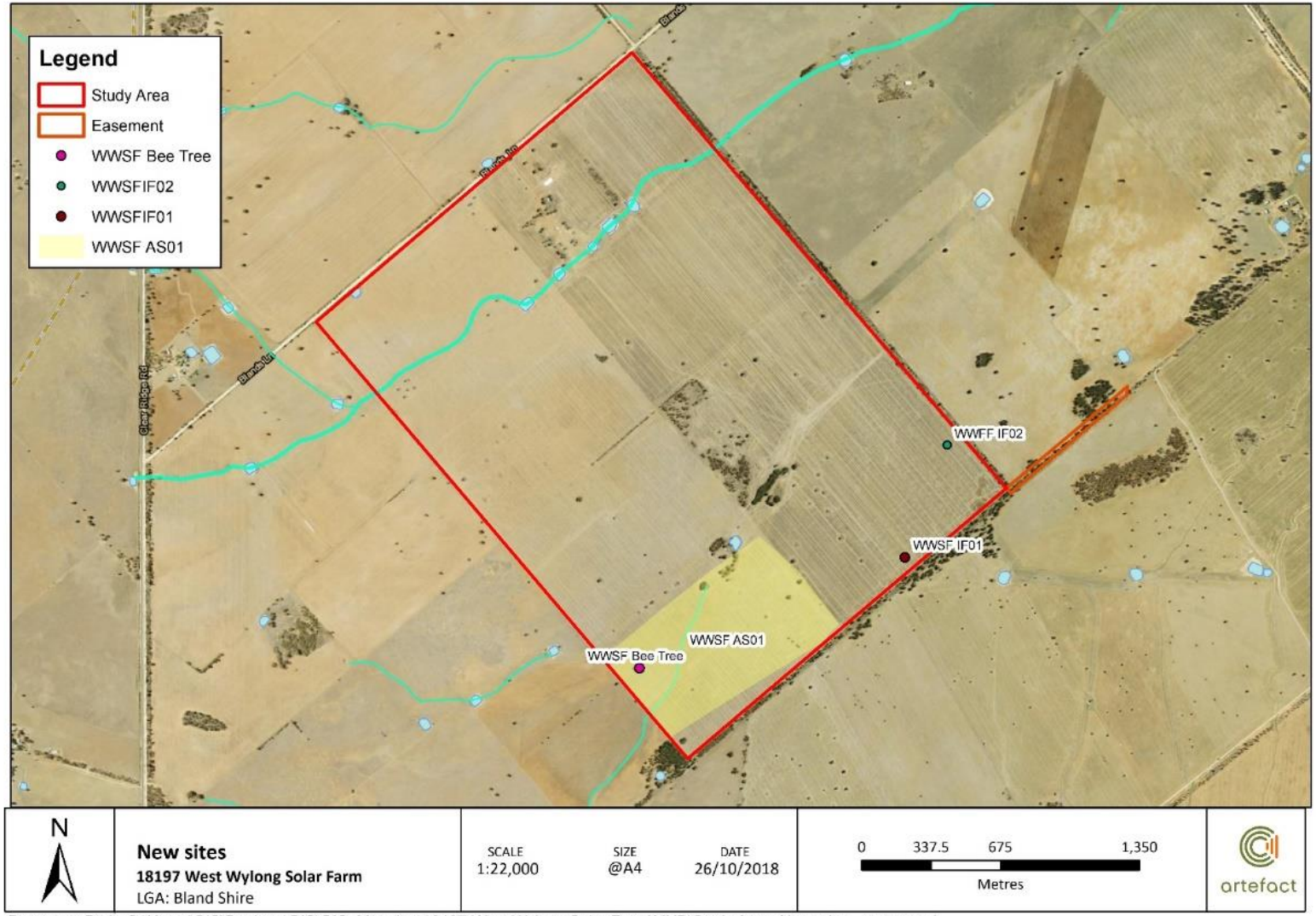
Very little archaeological research has been undertaken within the region, except for research undertaken in the distinct environmental context around Lake Cowal, approximately 15 km to the northeast of the Project.

Artefact Heritage (2018) undertook an Aboriginal archaeological survey of the Project. This identified four new Aboriginal sites (Table 9 and Figure 4):

Table 9: Aboriginal sites identified during archaeological survey

Site name	AHIMS site ID	Site description
West Wyalong Solar Farm Isolated Find 01	WWSF IF01 AHIMS ID 43-4-0056	Single chert flake
West Wyalong Solar Farm Isolated Find 02	WWSF IF02 AHIMS ID 43-4-0071	Single silcrete flake
West Wyalong Solar Farm Artefact Scatter 01	WWSF AS01 AHIMS ID 43-4-0057	14 isolated lithic artefacts, including a grinding stone fragment and a basalt manuport concentrated around the south western ephemeral drainage line
West Wyalong Solar Farm Bee Tree	WWSF Bee Tree AHIMS ID 43-4-0058	Culturally modified Belah tree resulting from bark removal and cutting into heartwood to place burning embers inside the tree to smoke out bees

Figure 4: Location of newly identified sites in Project



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6.0 IMPACTS AND RISKS

6.1 Aboriginal archaeological impact assessment

Aboriginal archaeological sites have been identified in the Project site, consisting of two isolated artefacts, (WWSF IF01 AHIMS ID 43-4-0056 and WWSF IF02 AHIMS ID 43-4-0071), an artefact scatter (WWSF AS01 AHIMS ID 43-4-0057) and a culturally modified Bee Tree (WWSF Bee Tree AHIMS ID 43-4-0058). The risks of impact to these sites through construction of the Project will be avoided through measures including the collection of artefacts of WWSF AS01 AHIMS ID 43-4-0057 that are within the development footprint prior to works and through the construction of NO GO ZONES surrounding the Bee Tree and around artefacts of WWSF AS01 AHIMS ID 43-4-0057 that are located outside of the development footprint.

Potential impacts to Aboriginal archaeological resources during the construction and operation phase of the Project are summarised below.

1. Installation of perimeter security fencing

Installation of perimeter security fencing and associated activities has the potential to impact identified Aboriginal artefacts, particularly WWSF Bee Tree AHIMS ID 43-4-0058 which is located near the property boundary, and those items of WWSF AS01 AHIMS ID 43-4-0057 situated between the property boundary and the perimeter security fence which are not proposed to be collected.

2. Excavation for and installation of subsurface electrical connection cables and excavation of bases for solar panel stands

Although the extent of such excavation is limited, the activity has the potential to impact identified Aboriginal artefacts.

3. Installation of solar panel stands and solar panels

Ancillary works including vehicle tracking and bulk materials handling have the potential to impact identified Aboriginal artefacts.

4. Grading and sealing of internal access roads

Grading of the soil surface has potential to impact identified Aboriginal artefacts.

5. Installation of a substation and battery energy storage system

Construction of a substation and battery energy storage system has potential to impact identified Aboriginal artefacts.

6. Ongoing operation of the Project

Maintenance and access to the solar farm has potential to impact identified Aboriginal artefacts.

7.0 MANAGEMENT MEASURES

This section describes the overall approach associated with the management and mitigation of Aboriginal cultural heritage throughout the lifetime of the Project. The following management measures are based on the following Project approval documents:

- Office of Environment and Heritage (OEH) response to SEARS (OEH 10 September 2018, Ref: DOC 18/635151).
- West Wyalong Solar Farm: Aboriginal Archaeological Survey Report. Report to Lightsource Development Services Australia, prepared by Artefact Heritage (November 2018).
- West Wyalong Solar Farm: Aboriginal Cultural Heritage Assessment Report. Report to Lightsource Development Services Australia, prepared by Artefact Heritage (March 2019).

7.1 Specific management measures

Four Aboriginal archaeological sites were identified in the Project:

- West Wyalong Solar Farm Isolated Find 01 (WWSF IF01 AHIMS ID 43-4-0056)
- West Wyalong Solar Farm Isolated Find 02 (WWSF IF02 AHIMS ID 43-4-0071)
- West Wyalong Solar Farm Artefact Scatter 01 (WWSF AS01 AHIMS ID 43-4-0057)
- West Wyalong Solar Farm Bee Tree (WWSF Bee Tree AHIMS ID 43-4-0058)

The following sections detail measures required to prevent damage to these sites through construction of the Project, with reference to the risks identified in Section 6.0.

7.1.1 Prior to commencement of works

7.1.1.1 Artefact collection

An application for a Care Agreement to allow the salvage of artefacts was lodged with Heritage NSW on 2 July 2020. In accordance with the ACHAR, once the Care Agreement has been approved, collection of artefacts must take place prior to the commencement of works, including prior to installation of perimeter fencing. Suitably qualified archaeologists will work in conjunction with RAPs to identify and retrieve isolated artefacts WWSFIF01, WWSFIF02, and those artefacts of WWSFAS01 that will be located within the development footprint. Recovery of artefacts will take place through pedestrian survey guided by GIS and mapping. The location of these artefacts is shown in Figure 6.

7.1.1.2 Care Agreement

Collection of artefacts must only take place once a Care Agreement has been obtained. Collected artefacts are to be lodged at the West Wyalong LALC under a Care Agreement registered with the Department of Premier and Cabinet (formerly functioning through the Office of Environment and Heritage). Once the care agreement is issued it is to be implemented. A copy of the care agreement should be kept on file on site with the HMP.

7.1.1.3 NO GO ZONES

Protection of uncollected artefacts

Prior to the commencement of works, the archaeological NO GO ZONE defined in the ACHAR must be established. This NO GO ZONE is shown in Figure 6 as extending along the south west boundary of the property, to enclose uncollected artefacts of WWSF AS01 AHIMS ID 43-4-0057 and to prevent unauthorised access to them. This archaeological NO GO ZONE will comprise standard agricultural wire and post fencing in its north, south and west perimeters, with the eastern perimeter formed by the site security fencing. Access to this archaeological NO GO ZONE is to be restricted to Project staff who have received site specific heritage induction training, or persons under their direct supervision. Activities that may impact artefacts of WWSF AS01 AHIMS ID 43-4-0057 including maintenance operations may not be carried out in the archaeological NO GO ZONE. The location of this NO GO ZONE is shown in Figure 6. Spatial coordinates for the NO GO ZONE are provided in Table 10.

Table 10: NO GO ZONE spatial coordinates (MGA 55)

Easting	Northing
529252.55	6258221.51
529357.35	6258298.73
529647.25	6257714.97
529738.70	6257780.59

Protection of WWSF Bee Tree AHIMS ID 43-4-0058

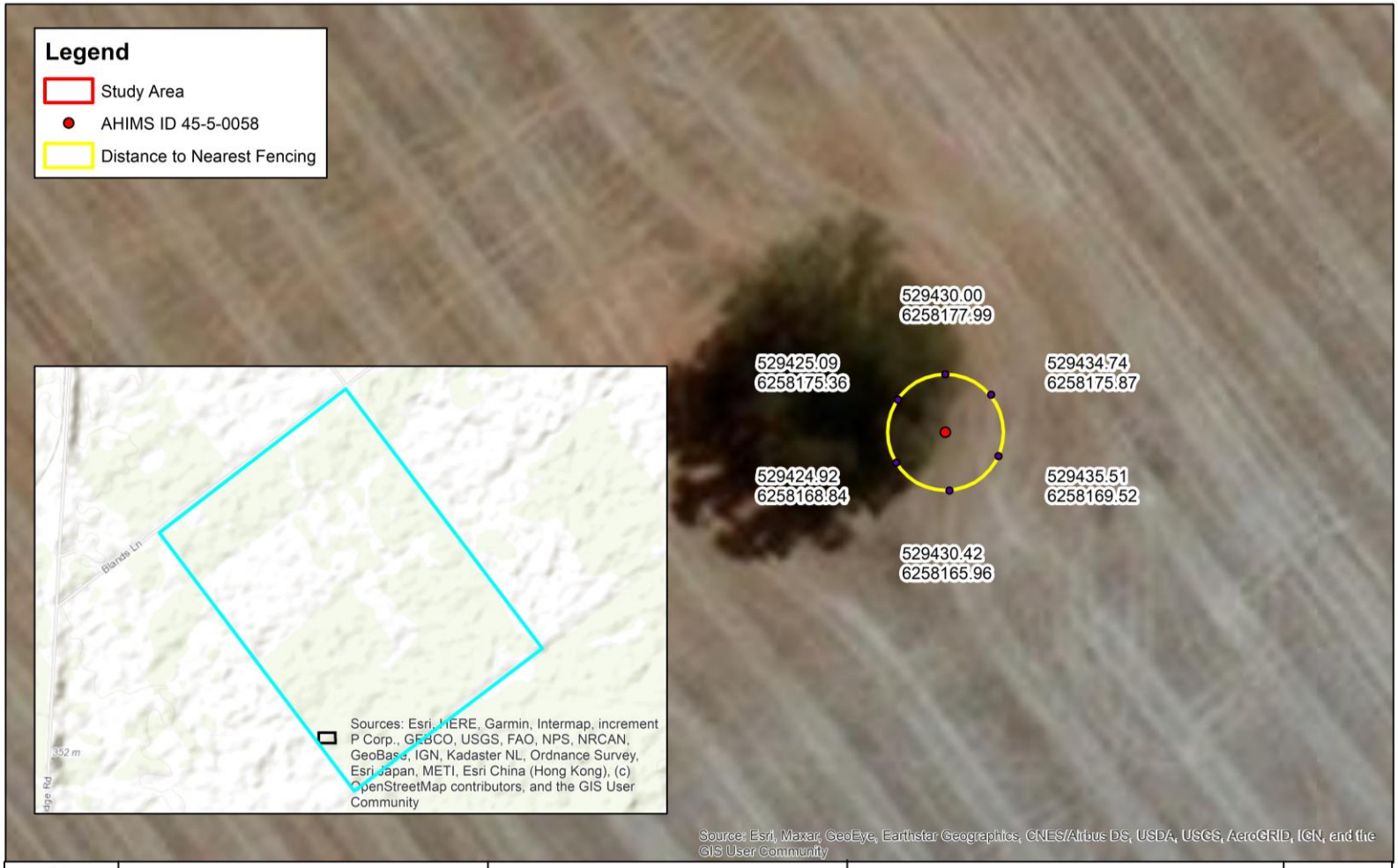
Prior to the commencement of construction an arborists report must be completed to advise the suitable size for an archaeological NO GO ZONE to be established around WWSF Bee Tree AHIMS ID 43-4-0058 to ensure its long term viability in protecting it from unintended impacts to the tree or its root system. This arborist report will be appended to this document. Figure 5 (below) will be updated to illustrate the extent of this NO GO ZONE. GPS coordinates of the NO GO ZONE perimeter points determined by the arborist are provided in Table 11 and are shown in Figure 5. These GPS coordinates must be established to an accuracy of less than one metre.

Table 11: GPS coordinates of Bee Tree NO GO ZONE GDA 1994 Zone 55

Easting	Northing
529425.09	6258175.36
529340.00	6258177.99
529434.74	6258175.87
529435.51	6258169.52
529430.42	6258165.96
529424.92	6258168.84

These archaeological NO GO ZONES must be established before the commencement of works. Access to archaeological NO GO ZONES is to be restricted to Project staff who have received site specific heritage induction training, or persons under their direct supervision. Activities including maintenance operations that may adversely impact WWSF Bee Tree AHIMS ID 43-4-0058 may not be carried out in the archaeological NO GO ZONES.

Figure 5: Location of Bee Tree and closest perimeter of NO GO ZONE.



Document Path: D:\GIS\GIS_Mapping\20073 West Wyalong Solar Farm\MXD\210073_AHIMS_ID_43_4_0058_V1.mxd

Signage

Permanent signage must be placed at the archaeological NO GO ZONES prior to construction advising that it contains Aboriginal cultural heritage. The location, nature and content of this signage must be established in conjunction with West Wyalong LALC. It is not the intent of this signage to draw attention to specific locations of Aboriginal artefacts in the archaeological NO GO ZONEs. Rather, this signage should serve to alert the public to the reasoning behind prohibition of entry.

Aboriginal heritage items in NO GO ZONES

Project heritage induction will include training on the identification and the legislative protection of Aboriginal cultural heritage items located in the NO GO ZONES. This must include training to assess the potential risk of damage to Aboriginal cultural heritage items through project activities, and formulation of work methods that will avoid such impacts. Records of induction must include electronic copy both stored onsite and backed up to an offsite facility. Training records including electronic and physical records of induction must be kept in the office of the EPC Site Manager or O & M Site Manager, and electronic copy must be provided to the West Wyalong LALC

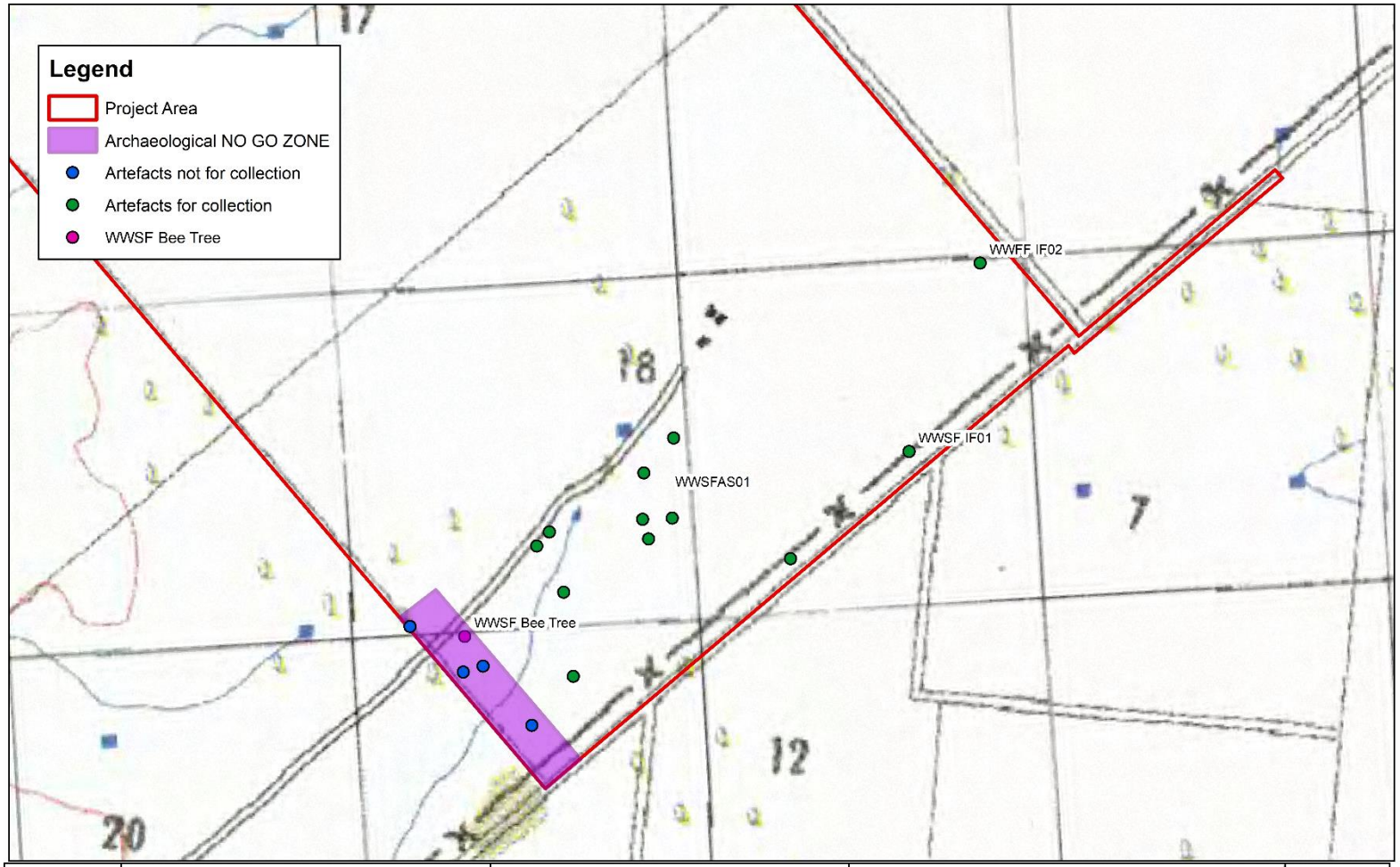
7.1.1.4 Artefact analysis

Artefacts must not be removed from the locale for analysis but will be analysed briefly and recorded at the West Wyalong LALC.

7.1.1.5 Site Impact Form

An Aboriginal Site Impact Recording Form (ASIRF) must be completed following any impacts to identified sites in the Project as a result of archaeological salvage or Project construction.

Figure 6: Location of identified Aboriginal heritage items and NO GO ZONE



Document Path: D:\GIS\GIS_Mapping\18197 West Wylong Solar Farm\MXD\20073_Artefacts_for_collection_v1_200629.mxd

7.1.2 After commencement of works

7.1.2.1 NO GO ZONES

The location of the archaeological NO GO ZONES must be shown on all construction plans. Copies of plans showing the location of the archaeological NO GO ZONES must be kept on site for reference. Access to archaeological NO GO ZONES may only be carried out by staff with site heritage induction or persons under their direct supervision. Activities including maintenance works that are likely to impact identified heritage items, may not be carried out in archaeological NO GO ZONES. The archaeological NO GO ZONES, their fencing and signage must be maintained through the operation of the Project.

7.1.2.2 Monitoring and Self Reporting

The perimeters of NO GO ZONES are to be inspected by Project staff on a fortnightly basis from the commencement of construction, including during preliminary works such as fencing construction. In the event that breaches to a NO GO ZONE perimeter are detected or evidence is present for unauthorised access to a NO GO ZONE having taken place, the following steps should be followed:

- The EPC Site Manager or O & M Site Manager must be notified.
- The Bee Tree and the location of uncollected Aboriginal artefacts shown in Figure 5 must be checked for damage:
    - In the event that no damage to these locations is apparent,
        - the NO GO ZONE must be resecured; and
        - the person/s responsible for such incursion or damage to perimeter must be identified if possible and advised of their breach to the Project Conditions of Consent.
    - If damage is apparent to the Bee Tree or to the location of uncollected Aboriginal artefacts shown in Figure 5 the following steps must be taken:
        - the NO GO ZONE must be resecured;
        - the event must be reported to Department of Planning, Industry and Environment (DPIE) NSW; and
        - the West Wyalong LALC must be informed and a heritage consultant must be engaged to evaluate potential damage.
- In the event of ongoing breaches to the NO GO ZONE (i.e. more than one breach in a six month period):
    - measures must be adopted to assess the methods of breach, and to appropriately secure the NO GO ZONE from further incursion through these means of access; and
    - monitoring frequency and methods must be reassessed in response.

7.1.2.3 Bee Tree Maintenance

An arborist report must be commissioned to assess the condition of the Bee Tree (AHIMS ID 43-4-0058), to determine the size of the required NO GO ZONE around it (Section 7.1.1.3) and to determine the appropriate frequency for on-going inspections. This report must be complete prior to the commencement of construction. A maintenance / observation program of WWSF Bee Tree (AHIMS ID 43-4-0058) must also be undertaken by the proponent to ensure the trees long term viability. This would entail both ongoing casual observation, also fortnightly direct inspection as part of the general heritage inspection regime described in Section 7.1.2.1 above. and also periodic inspection by an arborist. The timing of ongoing periodic arborist inspection must be established between the EB and the arborist following initial arborist inspection and prior to the commencement of construction . In the event that negative impacts or downturn in condition is observed to the WWSF Bee Tree (AHIMS ID 43-4-0058),

the West Wyalong LALC must be informed and permitted to inspect and assess WWSF Bee Tree (AHIMS ID 43-4-0058).

UPDATE - this Arborists report has been received and is included as Appendix 6 of this report.

7.1.2.4 Reporting

A report detailing the methodology and findings of the surface salvage must be produced by the participating archaeologists. This report must include detailed analysis of the retrieved artefacts.

7.1.2.5 Observation

Opportunity must be extended for representatives of the LALCs to observe the excavation of cable trenches in the Project to better inform their understanding of local soil conditions and the potential for Aboriginal cultural heritage. This is to constitute a single days' observation and is not considered an item for which payment would be made to LALCs.

7.1.2.6 Consultation

To keep consultation current, the Registered Aboriginal Parties identified in Table 2 must be sent updates on the progress of the Project at key points in the Project timeline:

- at commencement of construction;
- at mid point of construction (or every 6 months if delayed); and
- on commencement of operation.

These updates will include general information on:

- key construction goals and timelines;
- construction methods and strategies;
- project contacts and key staff; and
- opportunities for community engagement.

A record of all correspondence with RAPs must be maintained by appropriate levels of Project management as identified in Table 12 of this report.

7.1.3 Changes to development footprint

If changes are made to the development footprint within the NO GO ZONES, further archaeological assessment will be required.

7.1.4 At decommissioning of the Project

At the conclusion of the operation of the Project and prior to decommissioning or to changes in land use, the suitability of the NO GO ZONE must be reassessed through consultation with heritage specialists and RAPs identified through an updated consultation process.

7.2 General heritage management

7.2.1 Heritage induction

All staff working with the Project must undergo cultural heritage training prior to commencing work on site. Training of EPBC Site Managers, Health Safety and Environment Managers, O & M Site Managers and similar positions is to be conducted by the West Wyalong LALC. Records of induction must include

electronic copy both stored onsite and backed up to an offsite facility. Training records including electronic and physical records of induction must be kept in the office of the EPC Site Manager or O & M Site Manager, and electronic copy must be provided to the West Wyalong LALC. Cultural heritage training of other site staff is to be included in general site inductions using materials provided by West Wyalong LALC.

7.2.2 Unexpected finds

If at any time previously unidentified Aboriginal or historical heritage items are detected, the Unexpected Finds procedure provided in Appendix 3 of this document must be followed. This procedure sets out case specific procedural guidelines for recording and reporting on potential finds.

7.2.3 Aboriginal ancestral remains

If at any time Aboriginal ancestral remains (or any human remains) are identified, all works must cease in the vicinity of the remains and immediate surrounds (10m), the remains must be covered from view, secured from unauthorised trespass and NSW Police must be contacted immediately. If the remains are determined by NSW Police to be Aboriginal ancestral remains, West Wyalong LALC and Heritage NSW must be informed. The mode of exhumation and repatriation of Aboriginal ancestral remains is to be as determined by the West Wyalong LALC and by Aboriginal people with connection to local country.

If the West Wyalong LALC and Aboriginal people with connection to local country are of the opinion that study of these ancestral remains or their archaeological context is desirable then an archaeological program must be formulated for this purpose under their oversight. This may include forensic and osteological investigatory methods as deemed culturally appropriate by the West Wyalong LALC and by Aboriginal people with connection to local country.

8.0 ROLES AND RESPONSIBILITIES

Responsibility for the implementation of the management measures outlined in Section 6.0 are presented in Table 9.

All personnel are responsible for ensuring heritage items are protected and managed in accordance with the current HMP.

Failure to report discovery or damage or destruction resulting from unauthorised removal or alteration to a site of an archaeological object may be prosecuted under the *NP&W Act* and/or *Heritage Act*.

Table 12: Summary of roles and responsibilities

Roles	Responsibilities
Lightsource bp	• Ensure HMP adequately addresses heritage compliance. • Ensure heritage incidents are escalated to the relevant authorities.
EPC Project Manager	• Allocate sufficient resources for the implementation of this HMP. • Ensure that the outcomes of the visual checks/ compliance construction monitoring/ incident reporting are systematically evaluated as part of ongoing management of construction activities.
EB	• Oversee the overall implementation of this HMP including the implementation of heritage training and the creation and maintenance of heritage training records • Oversee and coordinate scheduled RAP communications • Ensure all relevant personnel have and understand the most up-to-date copy of this HMP. • Ensure that any required actions arising from the detection of unexpected heritage items or human remains are reported to the relevant personnel for further action and ensure that the actions are effectively implemented.
Site supervisors/ Site foreman/ contractors/subcontractors	• Understand and implement mitigation protocols as required in the HMP and any other required measures during construction. • Undertake relevant training to implement the requirements of this HMP. • All personnel are responsible for ensuring that heritage items to be retained are protected. • All site personnel to undertake environmental inductions which will include reference to the requirements of this Heritage Management Plan and the reporting process for unexpected finds.
Qualified heritage professional (archaeologist)	• The archaeologist will be responsible for providing advice to minimise potential impacts to any Aboriginal or historic heritage values that may be recorded during the construction activities.

9.0 ADDENDUM

10.0 REFERENCES

Artefact Heritage 2018, West Wyalong Solar Farm: Aboriginal Archaeological Survey Report. Report to Lightsource Development Services Australia

Artefact Heritage 2019, West Wyalong Solar Farm: Aboriginal Cultural Heritage Assessment Report. Report to Lightsource Development Services Australia

Guidelines

OEH 2010a, *Code of Practice for the archaeological investigation of Aboriginal objects in NSW*

OEH 2010b, *Aboriginal cultural heritage consultation requirements for proponents 2010*

OEH 2010c *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW*

APPENDIX 1: CARE AGREEMENT

NSW GOVERNMENT

Care Agreement

Your reference: West Wyalong Solar Farm Aboriginal Objects Care Agreement
Our reference: DOC20/857864
Contact: heritagemailbox@environment.nsw.gov.au

Mr Linton Howarth
CEO
West Wyalong Local Aboriginal Land Council
76-78 Main Street
West Wyalong NSW 2671

Email: wyalonglalc@gmail.com

CARE AGREEMENT 4658

Dear Mr Howarth,

I refer to your application for the transfer of Aboriginal objects for safe keeping under section 85A(1)(c) of the *National Parks and Wildlife Act 1974* (NPW Act), received by Heritage NSW on 2 July 2020.

Heritage NSW has considered the application and supporting information provided and has decided to transfer the Aboriginal objects to West Wyalong Local Aboriginal Land Council pursuant to s85A(1)(c) of the NPW Act, under a Care Agreement which includes a number of conditions. The Care Agreement is attached.

In order to execute the agreement and for it to be valid you need to:

1/ Sign the agreement in front of a witness in the space provided at the back of the form under "Care Agreement Executed as a Deed",

2/ Have your witness sign the agreement in the space provided

3/ Return the signed and witnessed agreement back to Heritage NSW.

If you have any questions, or wish to discuss this matter further please contact Heritage NSW on (02) 9873 8500 or heritagemailbox@environment.nsw.gov.au.

.....

Jackie Taylor

Senior Team Leader Aboriginal Cultural Heritage Regulation – South

Heritage NSW

(by Delegation)

Date: 19 October 2020

Notice No. 4658
Page 1 of 9

Heritage NSW | Department of Premier and Cabinet | Locked Bag 5020 Parramatta NSW 2124 | Phone: 02 9873 8500
Email: heritagemailbox@environment.nsw.gov.au | www.heritage.nsw.gov.au

NSW GOVERNMENT

Care Agreement

Care Agreement for the transfer and safekeeping of Aboriginal objects number: 4658

Section 85A1(c) *National Parks and Wildlife Act 1974* (NPW Act)

Heritage NSW
Heritage NSW
Aboriginal Cultural Heritage Regulation – South
Telephone number: (02) 9873 8500
Email: heritagemailbox@environment.nsw.gov.au

SCHEDULE A

Reference Schedule

Item 1	Name of Agreement Holder: Address: Phone number: Email:	West Wyalong Local Aboriginal Land Council 76-78 Main Street West Wyalong NSW 2671 (02) 6972 3493 wyalonglalc@gmail.com
Item 2	AHIP number	N/A State Significant Development_18_9504
Item 3	Commencement date	The date the agreement is signed for and on behalf of the agreement holder under 'Care Agreement Executed as a Deed'
Item 4	Term of care agreement	In perpetuity
Item 5	New storage location of Aboriginal objects	West Wyalong Local Aboriginal Land Council 76-78 Main Street West Wyalong NSW 2671

NSW GOVERNMENT

Care Agreement

Details

Parties

Secretary of the Department of Premier and Cabinet

And

The party identified at Item 1 of Schedule A to this Care Agreement (**Agreement holder**)

Background

A. On 2 July 2020 an application was made to the Secretary of the Department of Premier and Cabinet for the transfer and safekeeping of Aboriginal objects pursuant to s.85A1(c) of the National Parks and Wildlife Act 1974.

B. The application was made by the West Wyalong Local Aboriginal Land Council (LALC). The Aboriginal objects were identified during cultural heritage assessment for the West Wyalong Solar Farm, a State Significant Development. The objects listed in the application are stone artefacts and comprise isolated artefact site 43-4-0056, isolated artefact site 43-4-0071 and part of artefact scatter site 43-4-0057.

An 'Aboriginal Cultural Heritage Assessment Report' (ACHAR) and an 'Aboriginal Archaeological Survey Report' were prepared by Artefact Heritage for Lightsource Development Services Australia in 2019 as part of the West Wyalong Solar Farm Environmental Impact Statement. The assessment identified the three sites listed above and in addition a culturally modified tree (43-4-0058). The culturally modified tree (43-4-0058) and part of artefact scatter site 43-4-0057 will be avoided by the solar farm works and conserved.

The assessment included Aboriginal consultation in accordance with the 'Aboriginal cultural heritage consultation requirements for proponents 2010'. Documented correspondence with the Office of the Register of the Aboriginal Lands Rights Act 1983 identified the project area does not have Registered Aboriginal Owners pursuant to Division 3 of the Act.

During consultation for the assessment, West Wyalong LALC requested the salvaged artefacts be placed with their LALC. The solar farm project is within the boundary of the West Wyalong LALC. It was recommended in the ACHAR that following development consent and prior to the proposed salvage of stone artefacts of the sites, a Care Agreement must be sought for the retention of the artefact by West Wyalong LALC (Artefact Heritage, 2019:iv).

The West Wyalong Solar Farm, State Significant Development 9504 was approved on 28 November 2019 to the applicant Lightsource Development Services Australia Pty Ltd. Condition 19 of the consent stated that "Prior to carrying out any development that could directly or indirectly impact the heritage items identified in Table 2 of Appendix 3, the Applicant must salvage and relocate the item/s that would be impacted and obtain a Care Agreement for the transfer and safekeeping of artefacts to the West Wyalong Local Aboriginal Land Council". The items listed in Table 2 Appendix 3 are isolated artefact site 43-4-0056, isolated artefact site 43-4-0071 and the part of artefact scatter site 43-4-0057 within the development footprint and are consistent with the objects listed in the Care Agreement application.

The Aboriginal objects comprising stone artefacts will be kept in a locked display case in the keeping area of the LALC building.

It is anticipated that the Aboriginal objects will be made available to other persons in accordance with Aboriginal lore and custom (e.g. access to university students or archaeologists for research/educational purposes, access to members of a particular Aboriginal community or to all registered Aboriginal parties for educational purposes).

C. Aboriginal objects salvaged from sites 43-4-0056, 43-4-0071 and the part of site 43-0057 within the development footprint of the West Wyalong Solar Farm in accordance with State Significant

Care Agreement

Development Consent 9504 Condition 19. A detailed description of Aboriginal objects is provided under Schedule B.

Note: A Dictionary at the end of the Care Agreement defines terms used in this document. Further information about this Care Agreement is also set out after the Dictionary

NSW GOVERNMENT

Care Agreement

OPERATIVE PROVISIONS

1. COMMENCEMENT AND DURATION OF THE CARE AGREEMENT

1.1 The Care Agreement commences on the commencement date set out at Item 3 of Schedule A.

1.2 The term of this Care Agreement is stated at Item 4 of Schedule A.

2. LOCATION OF OBJECTS TO WHICH THIS CARE AGREEMENT APPLIES

2.1 The location/s of Aboriginal objects to which this Care Agreement applies is/are set out in Item 5 of Schedule A.

3. TRANSFER OF ABORIGINAL OBJECTS

3.1 Pursuant to s85A(1)(c) of the Act, the Aboriginal objects specified in Schedule B are transferred to the Agreement holder in accordance with the conditions of this Care Agreement.

4 RESPONSIBILITIES OF AGREEMENT HOLDER FOR SAFEKEEPING

4.1 Upon transfer of the Aboriginal objects specified in Schedule B to the Agreement holder, the safekeeping of those Aboriginal objects is the responsibility of the Agreement holder.

4.2 The Agreement Holder is to abide by the terms of this Care Agreement.

4.3 The Agreement holder must ensure that all persons involved in the safekeeping of the Aboriginal objects specified in Schedule B (whether employees, contractors, sub-contractors, agents or other persons granted access) are made aware of and comply with the conditions of this Care Agreement.

4.4 If the Aboriginal objects specified in Schedule B are loaned out for educational/display purposes, the responsibility for their safekeeping still rests with the Agreement holder.

5 CONDITIONS OF SAFEKEEPING

5.1 Upon transfer to the Agreement holder, the Aboriginal objects specified in Schedule B are to be stored securely at the storage location identified at [Item 5 of Schedule A]

5.2 A copy of Schedule B, which list the objects, must be kept with the collection.

5.3 The Aboriginal objects must be stored:

5.3.1 in a locked display case in the keeping place area of the building.

5.4 The display case must be labelled, and an 'independent' label on robust material (e.g. tyvek) written with permanent marker must be next to the object on display. The label must identify its:

5.4.1 contents

5.4.2 origin

5.4.3 storage location (any other information that will ensure that a bag and its contents can be returned to is correct storage location if it is left outside the storage box for any reason)

5.4.4 AHIMS site number(s)

5.5 Upon request, the Agreement holder must provide reasonable access to the Aboriginal objects specified in Schedule B, to any persons in accordance with Aboriginal lore and custom.

5.6 Upon request from Heritage NSW, the Agreement holder must provide reasonable access to Aboriginal objects specified in Schedule B to any Heritage NSW authorised officer.

6 **NOTIFICATION AND REPORTING CONDITIONS**

6.1 Written notice

6.1.1 The Agreement holder must notify Heritage NSW in writing within 7 days of taking custody of the Aboriginal objects specified in Schedule B, including providing the number of Aboriginal objects salvaged and in custody from each AHIMS site ID.

Notice No. 4658

Heritage NSW | Department of Premier and Cabinet | Locked Bag 5020 Parramatta NSW 2124 | Phone: 02 9873 8500
Email: heritagema@box@environment.nsw.gov.au | www.heritage.nsw.gov.au

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Care Agreement

6.1.2 Any requirement to provide written notice to Heritage NSW in this Care Agreement may be complied with by emailing or posting the notice to Heritage NSW. Heritage NSW's contact details are specified at the front of this Care Agreement.

6.2 The Agreement holder must seek approval from Heritage NSW by applying in writing to Heritage NSW, if they intend to move the Aboriginal objects specified in Schedule B to another location. The Aboriginal objects, subject to the application, must not be moved to the new location, until Heritage NSW has issued a written approval to the Agreement holder.

6.3 The Agreement holder must provide a copy of this Care Agreement to each Registered Aboriginal Party or others consulted, within 14 days from the date of this Care Agreement, to inform these parties of the Care Agreement.

7 GENERAL PROVISIONS

7.1 Variation of Care Agreement

7.1.1 The Agreement holder may apply to Heritage NSW in writing for a variation of any conditions of a Care Agreement.

7.2 Transfer of Care Agreement to another person

7.2.1 Only the Secretary of DPC can transfer Aboriginal objects under s85A1(c) of the Act.

7.2.2 If the Agreement holder wants the safekeeping under the Care Agreement to be the responsibility of another person, the Agreement holder must notify Heritage NSW in writing. The proposed new Care Agreement holder must then submit an application for a Care Agreement to Heritage NSW. This clause also applies in circumstances where a company is sold or wound up.

7.3 Termination of Care Agreement

7.3.1 The Care Agreement may be terminated at any time at the discretion of the Secretary of DPC, including where the Agreement Holder does not honour the terms of this Care Agreement.

7.3.2 Upon termination of the Care Agreement, the Agreement holder must arrange with Heritage NSW for the return of the Aboriginal objects within 30 days.

7.3.3 In the event the Agreement holder can no longer ensure safekeeping of the objects in accordance with the terms of the Care Agreement, whether by reason of death or other unexpected circumstances, the Aboriginal objects must be returned to the Secretary of DPC.

8 DICTIONARY

8.1 In this Care Agreement, unless the contrary is indicated, the terms below have the following meanings:

Aboriginal object(s)	has the same meaning as in the Act
Act	means the National Parks and Wildlife Act 1974 (NSW)
Agreement holder	means the person listed at Item 1 in Schedule A
AHIMS	means the Aboriginal Heritage Information Management System maintained by Heritage NSW/DPC
AHIP	means an Aboriginal Heritage Impact Permit issued by Heritage NSW/DPC under Part 6 of the National Parks and Wildlife Act 1974 (NSW)
Application	means the completed application form and all other documents in written or electronic form which accompanied the application when it was lodged or which were subsequently submitted in support of the application.

Care Agreement

Authorised officer	means an employee of the Heritage NSW/DPC who is appointed as authorised officer under s.156B of the Act
Care Agreement	means this document and includes all Schedules
Heritage NSW office	means the office listed on the cover page of this Care Agreement
Secretary	means Secretary of the Department of Premier and Cabinet
Registered Aboriginal Parties	means the following parties: West Wyalong Local Aboriginal Land Council 76 Main Street West Wyalong NSW 2671 Contact: Linton Howarth Young Local Aboriginal Land Council 247 Boorowa Street Young NSW 2594 Contact: Norma Freeman
Salvage	the recovery of Aboriginal objects in accordance with the conditions of any AHIP or State Significant Development Consent referred to in the Care Agreement.

NSW GOVERNMENT

Care Agreement

Care Agreement Executed as a Deed

EXECUTED for and on behalf of the Secretary, Department of Premier and Cabinet

By

Jackie Taylor
Name

19/10/2020
Date

Senior Team Leader
Aboriginal Cultural Heritage Regulation – South
Position

Signature

Witness (signature)

19/10/2020
Date

Kym McNamara
Name of Witness (print)

EXECUTED for and on behalf of the Agreement holder

By

LINTON HOWARTH
Name

20/10/2020
Date

CEO - WEST WYALONG LOCAL ABORIGINAL LAND COUNCIL
Position

Signature

Witness (signature)

LORRAINE HAMPTON
Name of Witness (print)

20/10/2020
Date

Notice No. 4658

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NSW GOVERNMENT

Care Agreement

SCHEDULE B

Aboriginal Objects

Aboriginal objects recovered during surface salvage at West Wyalong Solar Farm, Blands Lane, West Wyalong, NSW under State Significant Development Consent 9504.

Aboriginal objects identified on AHIMS:

AHIMS site ID	Site feature	Description of Objects	Number of Objects
43-4-0056	Artefact	Isolated find	
43-4-0071	Artefact	Isolated find	
43-4-0057	Artefact	Artefact scatter	

Notice No. 4658

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APPENDIX 2: AUTHOR QUALIFICATION

Planning, Industry & Environment

Eleanor Parry
Project Manager
Pitt & Sherry (Operations) Pty Ltd
Suite 902, North Tower
1-5 Railway Street
Chatswood NSW 2067

Email:eparry@pittsh.com.au

18/06/2020

Dear Ms Parry

West Wyalong Solar Farm (SSD 9504)
Request for endorsement to prepare Heritage Management Plan

I refer to the letter dated 28 May 2020 requesting endorsement of suitably qualified and experienced person to prepare a Heritage Management Plan for the West Wyalong Solar Farm.

The Department has reviewed the nomination and information provided and is satisfied that the proposed consultant is suitably qualified and experienced to prepare a Heritage Management Plan for the development, in accordance with the condition 20 of Schedule 3 of the development consent.

Accordingly, the Secretary has endorsed Michael Lever of Artefact Heritage to prepare a Heritage Management Plan.

If you wish to discuss the matter further, please contact Sung Pak on 02 8289 6755 or at Sung.Pak@planning.nsw.gov.au.

Your sincerely

Nicole Brewer
Director
Energy Assessments

As nominee of the Planning Secretary

4 Parramatta Square, 12 Darcy Street, Parramatta 2150 | dpie.nsw.gov.au | 1

APPENDIX 3: UNEXPECTED FINDS PROCEDURE

Examples of Aboriginal and historical artefacts are provided in Figure 7 to Figure 10 below.

If unanticipated archaeological items are uncovered at any time throughout the life of the project the following actions must be followed:

- Cease all activity in the vicinity of the find
- Leave the find in place and protect it from harm
- Erect a 10 m exclusion zone (temporary fencing/signage) around the find or the outer edge of the find if a larger item
- Take note of the details of the find and its location and take photographs of the find *in situ*
- Inform the EPC Site Manager (during construction) or O & M Site Manager (during operation) who would then inform the EPC Site Manager (during construction) or O & M Site Manager (during operation)
- The EPC Site Manager / O & M Site Manager must contact Lightsource bp to advise of the unexpected find.
- Lightsource bp will either contact a heritage consultant directly or request the EPC Site Manager / O & M Site Manager contact a heritage consultant to identify whether the item is a heritage item
- If the item is identified as a historic (non Aboriginal) heritage item, the heritage consultant will advise whether additional investigation is required in accordance with the conditions of approval and Heritage NSW guidelines
- If the item is confirmed as an Aboriginal artefact Lightsource bp will either notify Heritage NSW and West Wyalong LALC directly or request the EPC Site Manager / O & M Site Manager to notify Heritage NSW and West Wyalong LALC
- Await further advice from the heritage consultant before proceeding with work in the exclusion zone.
- Further archaeological investigation may be required as advised by the heritage consultant prior to work proceeding in the exclusion zone.
- Further archaeological investigation will be required if the artefact/s were not part of the AHIMS sites identified in this report (43-4-0056, 43-4-0057, 43-4-0071, 43-4-0058)
- If the item is identified as an Aboriginal artefact/s and no further archaeological assessment is deemed necessary, the artefact/s must be added to the existing Care Agreement collection.
- Artefacts must not be removed from the locality for analysis.
- The artefact/s must be subject to the same standard of recording and analysis as carried out for other salvaged items held under Care Agreement at the West Wyalong LALC
- The Care Agreement must be updated and an ASIRF must be submitted to include new finds.

Examples of Aboriginal heritage and historical archaeological remains

Figure 7: Aboriginal stone tools

Figure 8: Historical artefacts

Figure 9: Historical footings

Figure 10: Historical footings

APPENDIX 4: HERITAGE NSW COMMENTS ON HMP

Received via email 14 September 2020

Dear Michael,

Thank you for your email regarding the West Wyalong Solar Farm Heritage Management Plan and Care Agreement application. I apologise for the delay in replying.

In relation to the Heritage Management Plan (HMP):

Heritage NSW has reviewed the West Wyalong Solar Farm Heritage Management Plan (HMP) prepared by Artefact Heritage dated July 2020. We note the HMP has been prepared to meet Conditions of Development Consent for West Wyalong Solar Farm SSD 9504 dated 28 November 2019. Heritage NSW provide the following comments in relation to Aboriginal cultural heritage:

- Once the care agreement is issued it is to be implemented. A copy of the care agreement should be kept on file on site with the HMP.
- Section 2.3 states this section will be updated following comments received from the Registered Aboriginal Parties on the draft HMP and how the comments have been addressed by the applicant. If comments have been received by RAPs these need to be incorporated into the HMP.
- Regarding section 6.1.2.2. Monitoring and Self Reporting - the Conditions of Development Consent Schedule 4 Compliance condition 4 sets out the incident notification process to the DPIE. Condition 5 sets out the non-compliance notification process to the DPIE. We recommend the HMP be updated to reflect the consent conditions to also notify DPIE.

Please note: any comments sought on historic heritage matters can be addressed to the Major Projects Team at Heritage NSW via: HERITAGEMailbox@environment.nsw.gov.au

In relation to the Care Agreement application:

The application has been received by Heritage NSW and is currently being processed.

Please feel free to contact me if you require any further information.

Regards,
Jackie

Jackie Taylor | Senior Team Leader, Aboriginal Cultural Heritage Regulation - South

Heritage NSW, Department of Premier and Cabinet

Level 3, 11 Farrer Place, Queanbeyan NSW 2620

T: 02 6229 7089 | M: 0408 201 239 | Jackie.taylor@environment.nsw.gov.au

APPENDIX 5: RAP CONSULTATION LOG

Contact	Organisation	Contacted by Organisation		Method	Date	Comment/ response
AGENCY LETTERS 4.1.2 NOTIFICATION						
OEH Identification of Aboriginal parties	OEH - Griffith	J Norfolk	Artefact	email	10/10/2018	
LALC Identification of Aboriginal parties	West Wyalong LALC	J Norfolk	Artefact	email	10/10/2018	
BSC Identification of Aboriginal parties	Bland Shire Council	J Norfolk	Artefact	email	10/10/2018	
LLS Identification of Aboriginal parties	Riverina LLS	J Norfolk	Artefact	email	10/10/2018	
NNTT Identification of Aboriginal parties	NNTT	J Norfolk	Artefact	email	10/10/2018	
NTS Corp Identification of Aboriginal parties	NTS Corp	J Norfolk	Artefact	email	10/10/2018	
Registrar Identification of Aboriginal parties	Registrar	J Norfolk	Artefact	email	10/10/2018	
4.1.3 AD						
Koori mail advert		J Norfolk	Artefact	email	10/10/2018	In 17 October edition 687
Leader Wagga		J Norfolk	Artefact	online	10/10/2018	In 17 October paper
Agency Responses						

Contact	Organisation	Contacted by	Organisation	Method	Date	Comment/ response
J Norfolk	Artefact	Andrew Fisher	OEH	email	11/10/2018	Provided RAP list
A Darby	Artefact	Ray Smith	BSC	email	12/10/2018	Suggested West Wyalong LALC
A Darby	Artefact	Jodie Rikiti	Registrar	email	12/10/2018	
A Darby	Artefact		NNTT	email	15/10/2018	
A Darby	Artefact	Rob Kelly	RLLS	email	16/10/2018	Suggested West Wyalong LALC
RAP Expressions of Interest from Avert						
A Darby	Artefact	Lillie Carrol	DNC	email	18/10/2018	Registered interest
Invitation to Register 4.1.3						
West Wyalong Local Aboriginal Land Council		J Norfolk	Artefact	email	29/10/2018	Invitation to register for project sent
Murrin Bridge Local Aboriginal Land Council		J Norfolk	Artefact	email	29/10/2018	Invitation to register for project sent
Leeton & District Local Aboriginal Land Council		J Norfolk	Artefact	email	29/10/2018	Invitation to register for project sent
Narrandera Local Aboriginal Land Council		J Norfolk	Artefact	email	29/10/2018	Invitation to register for project sent
Young Local Aboriginal Land Council		J Norfolk	Artefact	email	29/10/2018	Invitation to register for project sent

Contact	Organisation	Contacted by	Organisation	Method	Date	Comment/ response
Condobolin Local Aboriginal Land Council		J Norfolk	Artefact	email	29/10/2018	Invitation to register for project sent
Wiradjuri Condobolin Corporation Ltd		J Norfolk	Artefact	email	29/10/2018	Invitation to register for project sent
Wiradjuri Council of Elders		J Norfolk	Artefact	Post	29/10/2018	Invitation to register for project sent
Registration of Interest						
A Darby	Artefact	Lillie Carrol	DNC	email	18/10/2018	Registered interest from AD
J Norfolk	Artefact	Ngangaanha	Wiradjuri Council of Elders	Phone	31/10/2018	Registered an interest
J Norfolk	Artefact	Marnie Freeman	Young LALC	email	1/11/2018	Registered an Interest for YOUNG LALC and eight other individuals Response: requested contacted details for all individuals for Consultation list
J Norfolk	Artefact	Marnie Freeman	Young LALC	email	2/11/2018	Received information for Site officers, will list them under Young Lalc
ACHAR methodology review						
West Wyalong Local Aboriginal Land Council		J Norfolk	Artefact	email	12/11/2018	Sent ACHAR methodology for rap review

Contact	Organisation	Contacted by	Organisation	Method	Date	Comment/ response
Young Local Aboriginal Land Council		J Norfolk	Artefact	email	12/11/2018	Sent Achar methodology for review to several members
Wiradjuri Council of Elders		J Norfolk	Artefact	Letter	12/11/2018	Sent ACHAR methodology for rap review
DNC		J Norfolk	Artefact	email	12/11/2018	Sent ACHAR methodology for rap review
Enid Clarke		J Norfolk	Artefact	email	12/11/2018	Sent ACHAR methodology for rap review
Alona Apps		J Norfolk	Artefact	email	12/11/2018	Sent ACHAR methodology for rap review
Krystal Ingram		J Norfolk	Artefact	email	12/11/2018	Sent ACHAR methodology for rap review
4.1.6 Letter to LALC and OEH						
rog.southwest@environment.nsw.gov.au	OEH	A Darby	Artefact	email	14/11/2018	Sent list of registered stakeholders to OEH
Leeanne Hampton	West Wyalong LALC	A Darby	Artefact	email	14/11/2018	Sent list of registered stakeholders to West Wyalong LALC
A Darby	Artefact	Andrew Fisher	OEH	email	15/11/2018	replied and acknowledged email

Contact	Organisation	Contacted by	Organisation	Method	Date	Comment/ response
AFG						
Marnie Freeman	Artefact	V Edmonds	Young LALC	phone	15/11/2018	Called to discuss logistics and timing of AFG. Stated 6/12 best 2-3 pm. Call Norma Freeman on 20/11 to confirm. I pointed out no payment for attendance but could provide light refreshments
Bernie	Artefcat	V Edmonds	WW LALC	phone	15/11/2018	Called to discuss whether WW LALC would like to meet to discuss project and results of ASR. Said yes but to call Leanne Hampton on the 16/12 to confirm
Robert Clegg	Artefact	V Edmonds	Wiradjuri COE	phone	15/11/2018	Called to discuss if they could make AFG in Young on 6/12. Said yes. I pointed out no payment for attendance but could assist with mileage
Norma Freeman	Artefact	V Edmonds	Young LALC	phone	20/11/2018	Called to discuss AFG on the 6/12. That date not suitable. Norma suggested 11/12/2018

Contact	Organisation	Contacted by	Organisation	Method	Date	Comment/ response
Leanne Hampton	Artefcat	V Edmonds	WW LALC	phone	20/11/2018	Called to discuss AFG. Leanne agreed to 9.30 am on 11/12/2018. Mentioned they didn't register because they don't get Wagga newspaper
Paul and Lillie Carol	DNC	V Edmonds	Artefact	email	20/11/2018	Sent agenda for both West Wyalong and Young AFGs
Robert Clegg	Wiradjuri COE	V Edmonds	Artefact	email	20/11/2018	Sent agenda for both West Wyalong and Young AFGs
Leeanne Hampton	West Wyalong LALC	V Edmonds	Artefact	email	20/11/2018	Sent agenda for West Wyalong AFG
Enid Clarke		V Edmonds	Artefact	email	20/11/2018	Sent agenda for Young AFG
Leeanne Hampton	West Wyalong LALC	A Darby	Artefact	email	21/11/2018	Forwarded AFG email to the Gmail email address
Robert Clegg	Wiradjuri COE	A Darby	Artefact	email	21/11/2018	Mailed hardcopies of both AFGs
Keith Freeman	Young LALC	A Darby	Artefact	email	21/11/2018	mailed hardcopy of the Young AFG
Enid Clarke	Young LALC	A Darby	Artefact	email	21/11/2018	mailed hardcopy of the Young AFG
Alona Apps	Young LALC	A Darby	Artefact	email	21/11/2018	mailed hardcopy of the Young AFG

Contact	Organisation	Contacted by	Organisation	Method	Date	Comment/ response
Krystal Ingram	Young LALC	A Darby	Artefact	email	21/11/2018	mailed hardcopy of the Young AFG
Robert Clegg	Wiradjuri COE	A Darby	Artefact	email	6/12/2018	reminder about the upcoming AFG
Paul and Lillie Carol	DNC	A Darby	Artefact	email	6/12/2018	reminder about the upcoming AFG
Young LALC		A Darby	Artefact	email	6/12/2018	reminder about the upcoming AFG
Enid Clarke		A Darby	Artefact	email	6/12/2018	reminder about the upcoming AFG
Alona Apps		A Darby	Artefact	email	6/12/2018	reminder about the upcoming AFG
Krystal Ingram		A Darby	Artefact	email	6/12/2018	reminder about the upcoming AFG
Leeanne Hampton	West Wyalong LALC	A Darby	Artefact	email	6/12/2018	reminder about the upcoming AFG
Draft ACHAR Review						
Robert Clegg	Wiradjuri Council of Elders	A Darby	Artefact	email	7/01/2019	Sent draft ACHAR for review
Paul and Lillie Carol	DNC	A Darby	Artefact	email	7/01/2019	Sent draft ACHAR for review
Norma Freeman	Young LALC	A Darby	Artefact	email	7/01/2019	Sent draft ACHAR for review

Contact	Organisation	Contacted by	Organisation	Method	Date	Comment/ response
Enid Clarke	Young LALC	A Darby	Artefact	email	7/01/2019	Sent draft ACHAR for review
Alona Apps	Young LALC	A Darby	Artefact	email	7/01/2019	Sent draft ACHAR for review
Krystal Ingram	Young LALC	A Darby	Artefact	email	7/01/2019	Sent draft ACHAR for review
Jirrah Freeman	Young LALC	A Darby	Artefact	email	7/01/2019	Sent draft ACHAR for review
Jahnayah Freeman	Young LALC	A Darby	Artefact	email	7/01/2019	Sent draft ACHAR for review
Marnie Freeman	Young LALC	A Darby	Artefact	email	7/01/2019	Sent draft ACHAR for review
Keith Freeman	Young LALC	A Darby	Artefact	email	7/01/2019	Sent draft ACHAR for review
Leeanne Hampton	West Wyalong LALC	A Darby	Artefact	email	7/01/2019	Sent draft ACHAR for review
Robert Clegg	Wiradjuri Council of Elders	M. Lever	Artefact	email	22/07/2020	Sent HMP for review
Paul and Lillie Carol	DNC	M. Lever	Artefact	email	22/07/2020	Sent HMP for review
Norma Freeman	Young LALC	M. Lever	Artefact	email	22/07/2020	Sent HMP for review
Enid Clarke	Young LALC	M. Lever	Artefact	email	22/07/2020	Sent HMP for review
Alona Apps	Young LALC	M. Lever	Artefact	email	22/07/2020	Sent HMP for review

Contact	Organisation	Contacted by	Organisation	Method	Date	Comment/ response
Krystal Ingram	Young LALC	M. Lever	Artefact	email	22/07/2020	Sent HMP for review
Jirrah Freeman	Young LALC	M. Lever	Artefact	email	22/07/2020	Sent HMP for review
Jahnayah Freeman	Young LALC	M. Lever	Artefact	email	22/07/2020	Sent HMP for review
Marnie Freeman	Young LALC	M. Lever	Artefact	email	22/07/2020	Sent HMP for review
Keith Freeman	Young LALC	M. Lever	Artefact	email	22/07/2020	Sent HMP for review
Leeanne Hampton	West Wyalong LALC	M. Lever	Artefact	email	22/07/2020	Sent HMP for review
HMP Responses						
M. Lever	Artefact Heritage	Robert Clegg	Wiradjuri Council of Elders	Email	23/8/2020	Michael, This looks good to me, You have covered everything that was needed and I hope it all works out accordingly.

APPENDIX 6: ARBORISTS REPORT

Tony McManus
Consulting Arborist

Tree Protection Report for "Bee Tree" Belah *Casuarina cristata*

Report Number: PCL001

Prepared for PCL Constructors Pacific Rim Pty Ltd

June 2021

Prepared by Tony McManus Dip. Arb.
AQF Level 5 Consulting Arborist

P.O Box 782 Forbes 2871

Phone 0405 222 484

tonymcarborist@gmail.com

QTRA
Registered User

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Brief

This report has been prepared for Hesham Shehata of Pacific Constructors Pacific Rim Pty Ltd. Tony McManus Consulting Arborist has been instructed to inspect and assess a group of Belah *Casuarina crista* trees located within an area to be developed as part of a solar farm project in Wyalong, NSW.

Hesham has requested an assessment of the health and condition of the trees and specifications for protection of the trees from the impact of the surrounding development. The report also recommends appropriate remedial actions that can be implemented to promote the ongoing health and viability of the trees.

Methods

A site inspection was undertaken on the 14/6/2021. The trees were inspected using a Stage 1 and Stage 2 Visual Tree Assessment (VTA)[1]. The assessment of the trees was performed at ground level and all observations made were visual. A drone was used to inspect the canopy of the trees and to check for the presence of bees in one individual tree of particular cultural interest. Assessments of tree health and condition are based on the condition of the trees at the time of inspection.

Specifications for tree protection by establishing a Tree Protection Zone (TPZ) by erecting sturdy fence were developed in accordance with the guidelines provided by the Australian Standard for the Protection of Trees on Development Sites (AS 4970-2009).

Identification of the trees is not based on a full taxonomical description and is based on the taxonomical features present at the time of inspection. All trees are measured for DBH (Diameter at Breast Height) approximately 1.4m above ground level) using a diameter tape. The DBH of multi-stemmed trees are calculated by adding the combined diameters of all trunks. Measurements of tree height and canopy spread are recorded using estimates in metres.

[1] Visual Tree Assessment (VTA) is an internationally accepted and peer reviewed tree inspection method published by Mattheck and Breloer in 1994. VTA is based on the recognition of tree defect symptoms that are used as indicators to highlight failure criteria. The process is based on reading the body language of the tree; the responses, repairs and optimisation techniques that a tree uses to overcome its weaknesses. The method is used to systematically interpret the visual signs of defects.

Stage 1 VTA is a visual inspection for defect symptoms and tree health and vitality that is performed from the ground. No aerial inspections or measurement and testing of defect symptoms is undertaken.

Stage 2 VTA is undertaken when visual indicators of structural defects or anomalies are identified within a tree that warrant further investigation or measurement. Methods may include aerial inspection and basic field testing such as “sounding” with a mallet or probing of cavities to assess the structural integrity of tree trunks.

Equipment Used

Data for the assessment was collected with a handheld unit utilising Trimble Terraflex, a geospatial field data collection application and the Global Navigation Satellite System. Tree data including species, measurements, observations and recommendations are then presented using kml and csv files generated with Trimble Connect software version 4.32.1912.1616.

Observations

The subject trees are a group of 22 semi-mature 20 m high, 50 cm DBH Belah *Casuarina cristata* trees. The trees are isolated paddock trees surrounded by cultivated farmland accessed on the corner of Blands Lane and Gordons Lane Wyalong, NSW.

At the time of the assessment the canopy of the trees had sparse, undersized foliage. Dead branches are present within the canopies and dieback to the extremities of the branches was observed. Response growth at the sites of wounding was poor and limited twig extension growth indicates that the trees have low vitality and reserves of energy. Several of the trees are dead. The general condition of the trees has been assessed as fair to poor.

Herbicide use under the canopy of the trees is evident with dead weeds observed resulting spraying from the surrounding farming activities. Weeds including Boxthorn are present within the group of trees.

The factor of most concern for the health of the trees is the visible necrosis of cambium and conductive tissues at the root flare at the base of the trees. The damage has exposed cambium around the entire circumference of many of the trees leaving the exposed wood cells vulnerable to entry by decay fungi. The fruiting body of a suspected Ganoderma spp. decay fungi was observed on the lower trunk of one of the trees indicating the internal structural degradation of the trees trunk.

No visible signs of bees were observed during the time of the assessment.

Discussion

Increased activity within development sites can adversely affect the roots, trunk and crown of trees. Damage to any of these parts of the tree can adversely affect the functioning of the tree as a whole. When the impacts of development on trees are acknowledged and addressed at the earliest stages of the design process, it may be possible to avoid unnecessary damage to and even death of trees during and after construction.

The most likely cause of damage to trees on development sites is via the root system. Roots can be damaged in many ways including soil compaction by machinery, the removal of roots during earthmoving operations, soil buildup and chemical contamination by cement waste, fuel, solvents, oil and herbicides (Standards Australia, 2009).

Wounding of the trunk is another common type of tree damage that occurs during demolition and construction activities. The removal of bark from machinery impact can create entry

points for decay fungi organisms and in extreme circumstances structurally weaken the tree (Standards Australia, 2009).

Tree canopies are vulnerable to mechanical injury by machinery including cranes, trucks, scaffolding and hoarding. If canopy protection is required several options are available including pruning of branches prior to construction and TPZ establishment. The crown can also be protected by extension of the TPZ to 1m outside the perimeter of the crown (Standards Australia, 2009). Other protective measures for tree crowns include tying back of branches and pruning to AS 4373 specifications (Standards Australia, 2009).

Monthly inspections of tree protection measures and tree condition should be completed. An AQF Level 5 arborist should be consulted to supervise tree protection measures before and throughout site establishment including demolition, construction, landscaping and at the completion of all construction activity.

The largest of the subject trees at the solar farm site at Wyalong have a DBH of 50 cm. Using the AS 4373 specifications (Standards Australia, 2009) of 12 times trunk diameter the fence to protect these trees should be placed at a minimum of 6 metre for the trunk of the trees.

At the time of assessment and GPS plotting of approximate fence post positions the orientation of the solar panel rows was unknown. The position of the fence corners as contained in the individual tree data section of this report (pp 14) are based on the shape of the group of trees. Realignment of the fence position to match the orientation of the solar panels would be possible providing the distance of 6 metres from the nearest tree trunks is maintained. If necessary, the TPZ distance from the trunks could be reduced by a maximum of 10% if needed to accommodate construction of the solar panels.

Tree Protection Zones (TPZ) and Structural Root Zones (SRZ)

This report adopts the guidelines of AS 4970-2009 in regard to calculation of Tree Protection Zones (TPZ) and Structural Root Zones (SRZ). TPZ referred to throughout this report are areas surrounding a tree or groups of trees in which no excavation or construction related activities may occur. They are indicative areas to be isolated from all development related disturbances.

The radius of the TPZ is calculated multiplying the diameter of the tree at a height of 1.4m by 12. For example; a tree with a diameter of 1m has a TPZ of 12m. TPZ are to be defined by protective fences and appropriate signage as described in AS4970-2009.

This report uses the term “indicative TPZ” in reference to an idealistic situation in which an area of 12 times trunk diameter is available for isolation as specified by AS 4970-2000. Under the advice of an AQF Level 5 arborist TPZs can be reduced in size to allow development in situations where the health and condition of the tree will not be affected.

Some flexibility in regard to encroachment into TPZ for excavation or trenching is possible. In consultation with an arborist variations of 10% of the area of a TPZ are allowable without root mapping. If major encroachment into the TPZ is proposed the viability of the tree must be assured by an arborist using low-impact root mapping (Standards Australia, 2009).

Structural Root Zones (SRZ) are indicative areas required by the tree to maintain adequate structural stability. These areas are only considered when major encroachment of the TPZ is necessary to allow construction or development (Standards Australia, 2009).

The SRZ radius formula is…

SRZ radius = (Dx50)0.42x0.64

(Standards Australia, 2009)

Restricted activities within the TPZ listed by AS 4970-2009 are…

- Placement of fill or soil level changes
- Machine excavation including trenching
- Preparation of chemicals or cement products
- Cultivation
- Refuelling
- Wash down of equipment
- Lighting of fires
- Installation of utilities and signs
- Physical damage to the tree

Compensating for Development Related Impacts

If harm to tree roots occurs as a result of development activity it is important to seek to minimise the impact of such harm. Damage to roots by cutting or mechanical excavation reduces the capacity of the tree to uptake water and nutrients. An attempt can be made to offset these losses by compensation in the form of increased irrigation and mulching within the TPZ. Water should be added to the root area of the tree until the upper 15-45 cm of soil is penetrated. With drought tolerant species in a Mediterranean climate 2.5 to 5 cm of water should be applied monthly depending on seasonal conditions (Fite, K, Smiley, E, T, 2009).

If roots are exposed and cut by trenching they should be backfilled as soon as possible. When backfilling is delayed by the sequence of construction activities a temporary hoarding of plywood should be used to immediately backfill against.

Roots exposed by excavation should be prevented from drying out by installing temporary root protection such as moisture retaining material or backfilling with soil to keep them moist (Standards Australia, 2009).

Tree Protection Methods

Fences

The most effective method of protecting trees on development sites is to erect a temporary fence to enclose the TPZ (Harris et al, 2004). The Australian Standard for Protection of Trees on Development Sites specifies the TPZ should be secured to prevent access with fence posts and supports of greater than 20mm.

To be effective tree protection must be planned with the project design and will not be successful if initiated after construction begins (Harris et al, 2004)

Erection of a strong fence to exclude construction activity from the TPZ is the single most effective method to exclude tree damage. The fence should be erected prior to site establishment and needs to remain in place until construction ceases (Harris et al, 2004).

Trunk Protection

Protection of the trunk and branches of tree can be achieved by strapping battens of timber around the vulnerable limbs. A soft padding or hessian should be laid beneath the battens to cushion any impact.

Machinery Damage

Traffic within the TPZ can lead to soil compaction and mechanical root damage. Actions to reduce or avoid this damage include laying 300mm of woodchip within the TPZ followed by the use of track pads, rumble boards or road mats to avoid wheel rutting (Fite, K, Smiley, E, T, 2009).

The impact of machinery on trees on development sites can be minimised by establishing adequate and secure TPZ areas. If access to the TPZ by machinery is essential the likelihood of soil compaction and root damage can be lessened by…

- applying 300mm of woodchip
- laying 20mm plywood down
- using 4x4 inch timber beams over a thick layer of mulch
- applying 150mm of gravel over geotextile fabric
- road mats over mulch

(Fite, K, Smiley, E, T, 2009).

The impact of machinery on trees on development sites can include crown damage by trucks, cranes and excavators. Construction injury or “dozer” blight is responsible for several types of tree damage….

- Soil compaction

- Root wounds and destruction of mycorrhizae
- Butt and trunk wounds
- Branch wounds
- Leaf injury from direct heat and fumes

(Shigo, A, L, 1991).

Mulching

The TPZ of the trees should be covered by a layer of mulch maintained to depth of 100mm and soil moisture levels should be monitored and maintained by the project arborist (Standards Australia, 2009).

Traffic within the TPZ can lead to soil compaction and mechanical root damage. Actions to reduce or avoid this damage include laying 300mm of woodchip within the TPZ followed by the use of track pads, rumble boards or road mats to avoid wheel rutting (Fite, K, Smiley, E, T, 2009).

Tree Sensitive Design and Construction Methods

Thoughtful planning and minor design adjustments can greatly improve the chance of successfully preserving trees as long term assets to the site. Tree damage is not easily corrected but can often be easily prevented (Harris et al, 2004).

Where it is inevitable that the root system of a tree as indicated by the TPZ or SRZ will be encroached upon by a proposed structure, consideration of alternative construction methods may provide a solution. Any negative impact on such trees may be minimised by designing structures near trees to avoid excessive excavation or soil contact.

Design options that minimise harm to trees include…

- pier and beam foundations
- suspended slabs
- cantilevered building sections
- screw pile
- contiguous piling

(Standards Australia, 2009).

In comparison to cement slabs on soil or peripheral foundations set at depth, pier footings with grade beams retains sections of soil and roots intact and is least disruptive to adjacent trees (Harris et al, 2004).

Services

Services to the proposed development should not be routed with the TPZ of the trees. If the installation of service with the TPZ is unavoidable they should be installed by means of directional boring at a minimal depth of 600mm under the advice of the project arborist (Standards Australia, 2009). Where utility lines are planned above ground, pole placement should consider the position and spread of tree branches to avoid interference with the tree canopy (Harris et al, 2004).

If it is not possible to avoid the routing of service lines through the TPZ the use of machinery to excavate in this area is not acceptable. Trenches within the TPZ of trees should be excavated manually under the direct supervision of an AQF Level 5 Arborist. If root pruning is necessary cuts should be made by the arborist leaving a flat surface with bark intact using sharp pruning tools.

Grade Changes

Construction often requires grade changes which entail filling; raising the soil level or cutting; lowering the soil level. It is important to maintain natural grade beneath a tree to avoid compaction, water movement, temperature and root growth problems (Harris et al, 2004).

On development sites where the adding of fill to the TPZ is unavoidable the soil should be kept as far from the trunk as possible. The soil should be spread as thinly as possible and consist of the same bulk density or coarser than the original soil. This is to allow adequate air and water movement between the underlying soil. Layers of sand, gravel or geotextile fabric should not be specified for use between the fill and soil as this can prevent the fill from draining and lead to perched water table (Fite, K, Smiley, E, T, 2009).

Any soil used to achieve a grade change between the construction and natural soil levels within the TPZ of Tree 1 must be of equal or lesser bulk density of the underlying soil. The fill soil should be applied as thinly as possible and finish as far away from the tree as the grade permits. The practice of using sand, gravel or geotextile fabric beneath the fill is discouraged and the fill should not be compacted (Fite, K, Smiley, E, T, 2009).

Retaining Walls

The impact of substantial grade changes beneath trees can be lessened by the use of retaining walls instead of forming a slope. Due to the cost of construction and associated excavation, retaining walls should be considered in situations where the grade change is greater than 600mm. Injuries to roots can be further reduced by specifying retaining walls with discontinuous footings that minimise excavation along the length of the wall (Harris et al, 2004).

Critical Stages of Construction for Trees

Several key stages of development can be identified with each stage presenting distinct challenges for the ongoing preservation of tree health.

Site Establishment

Site establishment should begin with the establishment of TPZs and tree protection devices.

Irreversible damage to trees often occurs in the early stages of site establishment and later efforts to remediate commonly fail. Trees are particularly vulnerable during site establishment activities involving the use of machinery to undertake demolition, unwanted tree removal and earthmoving.

Preparation for construction on development sites often involves demolition of an existing infrastructure and removal of large trees. Sites may need to be levelled by cutting and filling the natural soil line. Any necessary pruning of trees to be retained should be done at this stage of the project. It is also vital to plan the positioning of any site sheds or temporary infrastructure to minimise impacts to the retained trees.

Construction

The construction stage includes the connection of power, water, telecommunication and other services to the site. Other construction related activities with potential to damage trees are the installation of footings and slabs or the erection of scaffolding near tree canopies (Standards Australia, 2009).

Services corridors to the proposed development should not be routed with the TPZ of the trees (Standards Australia, 2009). Where utility lines are planned above ground, pole placement should consider the position and spread of tree branches to avoid interference with the tree canopy (Harris et al, 2004).

Landscaping

Tree protection measures should remain in place during the final stages of construction including landscaping works. Construction of retaining walls, trenching for lighting and irrigation systems, planting and paving within TPZs should be monitored by a suitably qualified arborist who may approve the progressive removal of tree protection measures.

Specifications

Specification	Rationale
A permanent fence to establish a Tree Protection Zone (TPZ) should be erected at a minimum distance of 6 metres from the trunks of the trees.	The Australian Standard for Protection of Trees on Development Sites (AS4970-2009) recommends that a tree with a diameter of 1m has a TPZ of 12m. TPZ are to be defined by protective fences.
The position of the fence corners could be realigned if needed to accommodate the orientation of the solar panels provided the 6 metre distance is not reduced by more than 10%.	As specified the Australian Standard for Protection of Trees on Development Sites (AS4970-2009)
An AQF Level 5 arborist should be on site to supervise excavation for fence post holes.	Root pruning cuts should be made by an arborist leaving a flat surface with bark intact using sharp pruning tools.
Herbicide use within the TPZ should be excluded. A 30 cm layer of weed-free woodchip mulch should be applied within the TPZ and beneath the trees.	Mulch will control weeds and conserve moisture. The trees are already in a fair to poor condition and herbicide injury should be avoided.
Supplementary watering of the trees should begin before, and continue throughout, the construction period. Apply 25 mm of water per month less the amount of any rainfall that is received.	Supplementary watering is necessary to compensate for any root loss that may occur throughout the installation of the new concrete tree surrounds

Definitions for Classes of Tree Health

Excellent

The tree is an outstanding example of its species. The tree has achieved its ideal growth habit and is unaffected by climatic or environmental constraints. There are no signs of pest or disease within the tree.

Good

The tree has a dense canopy with full sized and healthy foliage. Some minor pest or disease problems may be present without seriously affecting the trees health. Response growth at the site of wounds or structural faults is adequate demonstrating good vitality.

Fair

The tree has adequate foliage cover with small amounts of dead branches visible within the canopy. There are visual indicators that the trees health is affected by insects or disease. The tree may have irregular form or poor branch architecture.

Poor

The tree has a sparse canopy with undersized or discoloured foliage. Annual twig extension growth is restricted. A large number of dead branches are present. The tree may show symptoms of stress resulting from climatic or environmental constraints. The trees response to wounding, pests or disease is limited by low vitality.

Very Poor

The tree has been strained by environmental factors, pests or disease and is in decline. The tree canopy is very sparse and a significant amount of dead branches or crown dieback are present. Response growth at wounding sites is minimal.

Dead

The tree is dead

Definitions for Classes of Risk

Thresholds	Description	Action
	Unacceptable Risks will not ordinarily be tolerated	• Control the risk
1/1 000	**Unacceptable** (where imposed on others) Risks will not ordinarily be tolerated	• Control the risk • Review the risk
	Tolerable (by agreement) Risks may be tolerated if those exposed to the risk accept it, or the tree has exceptional value	• Control the risk unless there is broad stakeholder agreement to tolerate it, or the tree has exceptional value • Review the risk
1/10 000	**Tolerable** (where imposed on others) Risks are tolerable if ALARP	• Assess costs and benefits of risk control • Control the risk only where a significant benefit might be achieved at reasonable cost • Review the risk
1/1 000 000	**Broadly Acceptable** Risk is already ALARP	• No action currently required • Review the risk

Definitions for Classes of Priority for Remedial Actions

No Action Currently Required

The tree poses a level of risk that is no greater than the average tree (<1 in 10,000,0000 risk of harm)[2]. The tree may have non-structural faults including small diameter dead branches and crown dieback or may be located within an infrequently used area.

Trees that require no current action may also be structurally uncompromised trees with no visible defects that are located within frequently occupied areas.

Ongoing

The tree may have structural faults or health problems that should be regularly monitored on an ongoing basis. The problems identified within the tree do not currently contribute to an unacceptable level of risk but have the potential to develop to the stage where remedial action is required in the future. Trees specified for ongoing monitoring may have imperfections with small tree parts that will increase in risk level as they increase in size.

When Resources Become Available

Many trees specified for remedial action would benefit from non-essential pruning. Actions may include removal of large diameter dead branches or adding mulch to root zones. Benefits associated with work specified for trees in this priority category may be aesthetic or tree health related.

Remedial actions specified may include reduction pruning of overextended branches or removal of large diameter dead branches in trees within low occupancy areas.

Action Required Within 6 Months

Remedial actions for completion within 6 months are specified for trees that have defects that elevate the level of risk posed by the trees but do not require immediate action. Specifications assigned to these trees are designed to reduce the level of risk to as Low As Reasonably Practicable (ALARP) as defined in Appendix a.

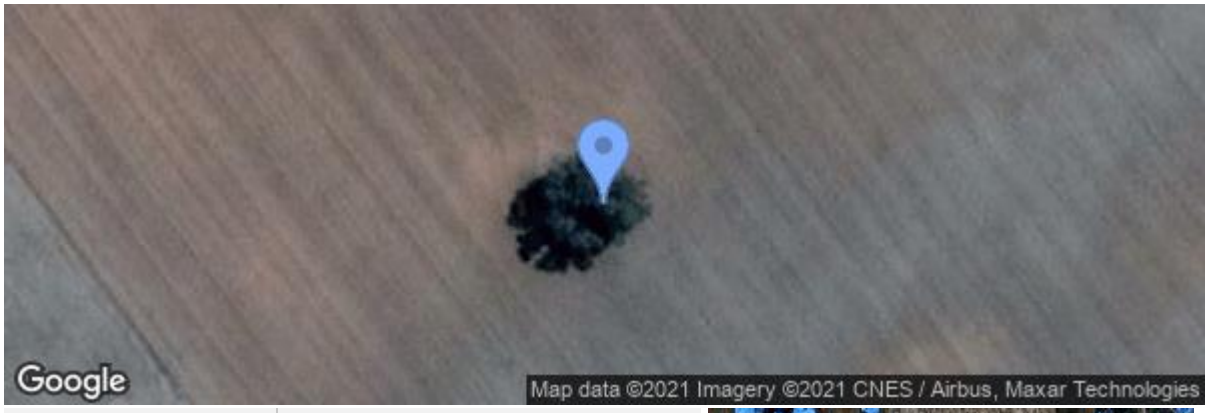
Remedial actions specified may include reduction pruning of overextended branches or removal of large diameter dead branches in trees within frequently occupied areas.

Immediate Action Required

The tree is hazardous or has tree parts that pose an unacceptable or extreme level of risk to the public. These trees are high risk trees that may include dead trees in an advanced stage of decomposition, detached and hanging branches, and structurally compromised or actively failing tree parts.

[2] Analysis of the Database of Australian Fatalities Associated with Tree Failures concludes the mortality rate from accidental tree failure in Australia is 1 in 5,000,000 (Hartley, M, Chalk, J, 2019). The risk, per tree, of causing a fatality is of the order of one in 150 million for all trees in Britain is one in 10 million for those trees in, or adjacent to areas of high public use (UK Health and Safety Executive, 2007).

Individual Tree Data



TreeID:	1
Asset Number:	
Species:	Casuarina cristata
Diameter at Breast Height (DBH):	50
Height:	19
Spread:	8
Observations:	Large diameter (>5cm) dead branches Crown dieback Basal/root flare wound Hollows
Health:	Poor
QTRA Risk of Harm Treshold:	
Created:	14/06/2021 10:43
Specifications:	install tree protection zone
Priority:	Immediate action required
Latitude:	-33.8162379
Longitude:	147.3179846
View in Google Maps	

TreeID:	2
Asset Number:	
Species:	Casuarina cristata
Diameter at Breast Height (DBH):	50
Height:	29
Spread:	8
Observations:	Overextended branches End-weighted branches Poor branch architecture Included bark in branch union Sparse canopy Small diameter (<5cm) dead branches Crown dieback Basal/root flare wound Necrosis at root flare. Visible signs of herbicide injury. Group of 22 homogenous trees.
Health:	Fair
QTRA Risk of Harm Treshold:	
Created:	14/06/2021 11:00
Specifications:	Selective branch removal required Reduction pruning required Remove dead trees
Priority:	Immediate action required
Latitude:	-33.8162858
Longitude:	147.3178867
[View in Google Maps]	

Latitude:	Fence corner 1 -33.81627364
Longitude:	147.3180601
Eastings:	529435.3019m (MGA Zone 55)
Northings:	6258169.463m (MGA Zone 55)
Estimated Accuracy:	4.76m
View in Google Maps	

Latitude:	Fence corner 2 -33.81638744
Longitude:	147.3178791
Eastings:	529418.5106 (MGA Zone 55)
Northings:	6258156.897 (MGA Zone 55)
Estimated Accuracy:	4.74m
View in Google Maps	

Latitude:	Fence corner 3 -33.81619175
Longitude:	147.3177322
Eastings:	529404.9874m (MGA Zone 55)
Northings:	6258178.637m (MGA Zone 55)
Estimated Accuracy:	4.89m
View in Google Maps	

	Fence Corner 4
Latitude:	-33.81610284
Longitude:	147.3179282
Eastings:	529423.1539m (MGA Zone 55)
Northings:	6258188.439m (MGA Zone 55)
Estimated Accuracy:	4.89m
View in Google Maps	

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Hartley, M, Chalk, J, 2019, A Review of Deaths in Australia from Accidental Tree Failures, The Bark, 24:2 Arboriculture Australia, Adelaide.

Hartley, M, 2011, The Risk of Death Inside a Building From Accidental Tree Failure, The Bark, 13:2 Arboriculture Australia, Adelaide.

UK Health and Safety Executive, 2007, Management of the risk from falling trees, http//www.hse.gov.uk/lau/lacs/23-22.htm

Appendix a: Quantified Tree Risk Assessment (QTRA) Practice Note

"When you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind"

William Thomson, Lord Kelvin, Popular Lectures and Addresses [1891-1894]

1. Introduction

Every day we encounter risks in all of our activities, and the way we manage those risks is to make choices. We weigh up the costs and benefits of the risk to determine whether it is acceptable, unacceptable, or tolerable. For example, if you want to travel by car you must accept that even with all the extensive risk control measures, such as seat-belts, speed limits, airbags, and crash barriers, there is still a significant risk of death. This is an everyday risk that is taken for granted and tolerated by millions of people in return for the benefits of convenient travel. Managing trees should take a similarly balanced approach.

A risk from falling trees exists only if there is both potential for tree failure and potential for harm to result. The job of the risk assessor is to consider the likelihood and consequences of tree failure. The outcome of this assessment can then inform consideration of the risk by the tree manager, who may also be the owner.

Using a comprehensive range of values[3], Quantified Tree Risk Assessment (QTRA) enables the tree assessor to identify and analyse the risk from tree failure in three key stages. 1) to consider land-use in terms of vulnerability to impact and likelihood of occupation, 2) to consider the consequences of an impact, taking account of the size of the tree or branch concerned, and 3) to estimate the probability that the tree or branch will fail onto the land-use in question. Estimating the values of these components, the assessor can use the QTRA manual calculator or software application to calculate an annual Risk of Harm from a particular tree. To inform management decisions, the risks from different hazards can then be both ranked and compared, and considered against broadly acceptable and tolerable levels of risk.

A Proportionate Approach to Risks from Trees

The risks from falling trees are usually very low and high risks will usually be encountered only in areas with either high levels of human occupation or with valuable property. Where levels of human occupation and value of property are sufficiently low, the assessment of trees for structural weakness will not usually be necessary. Even when land-use indicates that the assessment of trees is appropriate, it is seldom proportionate to assess and evaluate the risk for each individual tree in a population. Often, all that is required is a brief consideration of the trees to identify gross signs of structural weakness or declining health. Doing all that is reasonably practicable does not mean that all trees have to be individually examined on a regular basis (HSE 2013).

The QTRA method enables a range of approaches from the broad assessment of large collections of trees to, where necessary, the detailed assessment of an individual tree.

Risk of Harm

The QTRA output is termed the Risk of Harm and is a combined measure of the likelihood and consequences of tree failure, considered against the baseline of a lost human life within the coming year.

ALARP (As Low As Reasonably Practicable)

Determining that risks have been reduced to As Low As Reasonably Practicable (HSE 2001) involves an evaluation of both the risk and the sacrifice or cost involved in reducing that risk. If it can be demonstrated that there is gross

[3] 1 See Tables 1, 2 & 3.

disproportion between them, the risk being insignificant in relation to the sacrifice or cost, then to reduce the risk further is not 'reasonably practicable'.

Costs and Benefits of Risk Control

Trees confer many benefits to people and the wider environment. When managing any risk, it is essential to maintain a balance between the costs and benefits of risk reduction, which should be considered in the determination of ALARP. It is not only the financial cost of controlling the risk that should be considered, but also the loss of tree-related benefits, and the risk to workers and the public from the risk control measure itself.

When considering risks from falling trees, the cost of risk control will usually be too high when it is clearly 'disproportionate' to the reduction in risk. In the context of QTRA, the issue of 'gross disproportion'[4], where decisions are heavily biased in favour of safety, is only likely to be considered where there are risks of 1/10 000 or greater.

Acceptable and Tolerable Risks

The Tolerability of Risk framework (ToR) (HSE 2001) is a widely accepted approach to reaching decisions on whether risks are broadly acceptable, unacceptable, or tolerable. Graphically represented in Figure 1, ToR can be summarised as having a Broadly Acceptable Region where the upper limit is an annual risk of death 1/1 000 000, an Unacceptable Region for which the lower limit is 1/1 000, and between these a Tolerable Region within which the tolerability of a risk will be dependent upon the costs and benefits of risk reduction. In the Tolerable Region, we must ask whether the benefits of risk control are sufficient to justify their cost.

In respect of trees, some risks cross the Broadly Acceptable 1/1 000 000 boundary, but remain tolerable. This is because any further reduction would involve a disproportionate cost in terms of the lost environmental, visual, and other benefits, in addition to the financial cost of controlling the risk.

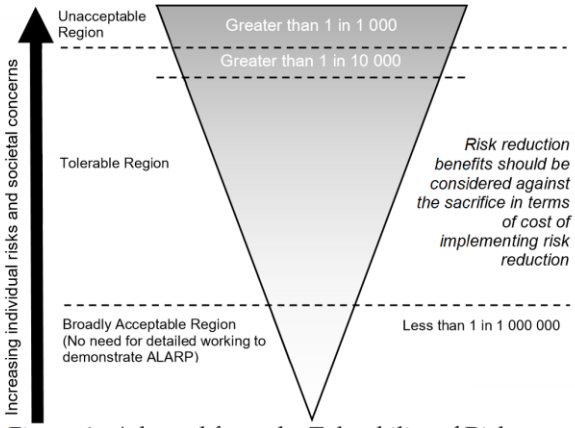

Figure 1. Adapted from the Tolerability of Risk framework (HSE 2001).

Value of Statistical Life

The Value of Statistical Life (VOSL), is a widely applied risk management device, which uses the value of a hypothetical life to guide the proportionate allocation of resources to risk reduction. In the UK, this value is currently in the region of £2 000 000 ($[5] 800 000), and this is the value adopted in the QTRA method.

In QTRA, placing a statistical value on a human life has two particular uses. Firstly, QTRA uses VOSL to enable damage to property to be compared with the loss of life, allowing the comparison of risks to people and property. Secondly, the proportionate allocation of financial resources to risk reduction can be informed by VOSL. ***"A value of statistical life of £1 000 000 is just another way of saying that a reduction in risk of death of 1/100 000 per year has a value of £10 per year"*** (HSE 1996).

Internationally, there is variation in VOSL, but to provide consistency in QTRA outputs, it is suggested that VOSL of £2 000 000 ($3 800 000) should be applied internationally. This is ultimately a decision for the tree manager.

[4] Discussed further in Section 4 below.

[5] See Tables 1, 2 & 3.

2. Ownership of Risk

Where many people are exposed to a risk, it is shared between them. Where only one person is exposed, that individual is the recipient of all of the risk and if they have control over it, they are also the owner of the risk. An individual may choose to accept or reject any particular risk to themselves, when that risk is under their control. When risks that are imposed upon others become elevated, societal concern will usually require risk controls, which ultimately are imposed by the courts or government regulators.

Although QTRA outputs might occasionally relate to an individual recipient, this is seldom the case. More often, calculation of the Risk of Harm is based on a cumulative occupation – i.e. the number of people per hour or vehicles per day, without attempting to identify the individuals who share the risk.

Where the risk of harm relates to a specific individual or a known group of people, the risk manager might consider the views of those who are exposed to the risk when making management decisions. Where a

risk is imposed on the wider community, the principles set out in the ToR framework can be used as a reasonable approach to determine whether the risk is ALARP.

3. The QTRA Method – Version 5

The input values for the three components of the QTRA calculation are set out in broad ranges[3] of Target, Size, and Probability of Failure. The assessor estimates values for these three components and inputs them on either the manual calculator or software application to calculate the Risk of Harm.

Assessing Land-use (Targets)

The nature of the land-use beneath or adjacent to a tree will usually inform the level and extent of risk assessment to be carried out. In the assessment of Targets, six ranges of value are available. Table 2 sets out these ranges for vehicular frequency, human occupation and the monetary value of damage to property.

Human Occupation

The probability of pedestrian occupation at a particular location is calculated on the basis that an average pedestrian will spend five seconds walking beneath an average tree. For example, an average occupation of ten pedestrians per day, each occupying the Target for five seconds is a daily occupation of fifty seconds, giving a likelihood of occupation 1/1,728. Where a longer occupation is likely, as with a

habitable building, outdoor café, or park bench, the period of occupation can be measured, or estimated as a proportion of a given unit of time, e.g. six hours per day (1/4). The Target is recorded as a range (Table 2).

Weather Affected Targets

Often the nature of a structural weakness in a tree is such that the probability of failure is greatest during windy weather, while the probability of the site being occupied by people during such weather is often low. This applies particularly to outdoor recreational areas. When estimating human Targets, the risk assessor must answer the question 'in the weather conditions that I expect the likelihood of failure of the tree to be initiated, what is my estimate of human occupation?' Taking this approach, rather than using the average occupation, ensures that the assessor considers the relationship between weather, people, and trees, along with the nature of the average person with their ability to recognise and avoid unnecessary risks.

Vehicles on the Highway

In the case of vehicles, likelihood of occupation may relate to either the falling tree or branch striking the vehicle or the vehicle striking the fallen tree. Both types of impact are influenced by vehicle speed; the faster the vehicle travels the less likely it is to be struck by the falling tree, but the more likely it is to strike a fallen tree. The probability of a vehicle occupying any particular point in the road is the ratio of the time it is occupied - including a safe stopping distance - to the total time. The average vehicle on a UK road is occupied by 1.6 people (DfT 2010). To account for the

substantial protection that the average vehicle provides against most tree impacts and in particular, frontal collisions, QTRA values the substantially protected 1.6 occupants in addition to the value of the vehicle as equivalent to one exposed human life.

Property

Table 1. Size

Size Range	Size of tree or branch	Range of Probability
1	> 450mm (>18") dia.	1/1 - >1/2
2	260mm (10½") dia. - 450mm (18") dia.	1/2 - >1/8.6
3	110mm (4½") dia. - 250mm (10") dia.	1/8.6 - >1/82
4	25mm (1") dia. - 100mm (4") dia.	1/82 - 1/2 500

* Range 1 is based on a diameter of 600mm.

Property can be anything that could be damaged by a falling tree, from a dwelling, to livestock, parked car, or fence. When evaluating the exposure of property to tree failure, the QTRA assessment considers the cost of repair or replacement that might result from failure of the tree. Ranges of value are presented in Table 2 and the assessor's estimate need only be sufficient to determine which of the six ranges the cost to select.

In Table 2, the ranges of property value are based on a VOSL of $3 800 000, e.g. where a building with a replacement cost of $38 000 would be valued at 0.01 (1/100) of a life (Target Range 2).

When assessing risks in relation to buildings, the Target to be considered might be the building, the occupants, or both. Occupants of a building could be protected from harm by the structure or substantially exposed to the impact from a falling tree if the structure is not sufficiently robust, and this will determine how the assessor categorises the Target.

Multiple Targets

A Target might be constantly occupied by more than one person and QTRA can account for this. For example, if it is projected that the average occupation will be constant by 10 people, the Risk of Harm is calculated in relation to one person constantly occupying the Target before going on to identify that the average occupation is 10 people. This is expressed as Target 1(10T)/1, where 10T represents the Multiple Targets. In respect of property, a Risk of Harm 1(10T)/1 would be equivalent to a risk of losing $38 000 000 as opposed to $3 800 000.

Tree or Branch Size

A small dead branch of less than 25mm diameter is not likely to cause significant harm even in the case of direct contact with a Target, while a falling branch with a diameter greater than 450mm is likely to cause some harm in the event of contact with all but the most robust Target. The QTRA method categorises

Size by the diameter of tree stems and branches (measured beyond any basal taper). An equation derived from weight measurements of trees of different stem diameters is used to produce a data set of comparative weights of trees and branches ranging from 25mm to 600mm diameter, from which Table 1 is compiled. The size of dead branches might be discounted where they have undergone a significant reduction in weight because of degradation and shedding of subordinate branches. This discounting, referred to as 'Reduced Mass', reflects an estimated reduction in the mass of a dead branch.

Table 2. Targets

Target Range	Property (repair or replacement cost)	Human (not in vehicles)		Vehicle Traffic (number per day)	Ranges of Value (probability of occupation or fraction of $3 800 000)
1	$3 800 000 –> $380 000	**Occupation:** **Pedestrians & cyclists:**	Constant – 2.5 hours/day 720/hour – 73/hour	26 000 – 2 700 @ 110kph 32 000 – 3 300 @ 80kph 47 000 – 4 800 @ 50kph	1/1 –>1/10
2	$380 000 –> $38 000	**Occupation:** **Pedestrians & Cyclists:**	2.4 hours/day – 15 min/day 72/hour – 8/hour	2 600 – 270 @ 110kph 3 200 – 330 @ 80kph 4 700 – 480 @ 50kph	1/10 –>1/100
3	$38 000 –> $3 800	**Occupation:** **Pedestrians & cyclists:**	14 min/day – 2 min/day 7/hour – 2/hour	260 – 27 @ 110kph 320 – 33 @ 80kph 470 – 48 @ 50kph	1/100 –>1/1 000
4	$3 800 –> $380	**Occupation:** **Pedestrians & cyclists:**	1 min/day – 2 min/week 1/hour – 3/day	26 – 4 @ 110kph 32 – 4 @ 80kph 47 – 6 @ 50kph	1/1 000 –>1/10 000
5	$380 –> $38	**Occupation:** **Pedestrians & cyclists:**	1 min/week – 1 min/month 2/day – 2/week	3 – 1 @ 110kph 3 – 1 @ 80kph 5 – 1 @ 50kph	1/10 000 –> 1/100 000
6	$38 –> $4	**Occupation:** **Pedestrians & cyclists:**	<1 min/month – 0.5 min/year 1/week – 6/year	None	1/100 000 –> 1/1 000 000

Vehicle, pedestrian and property Targets are categorised by their frequency of use or their monetary value. The probability of a vehicle or pedestrian occupying a Target area in Target Range 4 is between the upper and lower limits of 1/1,000 and >1/10,000 (column 5). Using the VOSL $3,800,000, the property repair or replacement value for Target Range 4 is $3,800- >$380.

Probability of Failure

In the QTRA assessment, the probability of tree or branch failure within the coming year is estimated and recorded as a range of value (Ranges 1 – 7, Table 3).

Selecting a Probability of Failure (PoF) Range requires the assessor to compare their assessment of the tree or branch against a benchmark of either a noncompromised tree at Probability of Failure Range 7, or a tree or branch that we expect to fail within the year, which can be described as having a 1/1 probability of failure.

During QTRA training, Registered Users go through a number of field exercises in order to calibrate their estimates of Probability of Failure.

Table 3. Probability of Failure

Probability of Failure Range	Probability
1	1/1 - >1/10
2	1/10 - >1/100
3	1/100 - >1/1 000
4	1/1 000 - >1/10 000
5	1/10 000 – >1/100 000
6	1/100 000 – >1/1 000 000
7	1/1 000 000 – 1/10 000 000

The probability that the tree or branch will fail within the coming year.

The QTRA Calculation

The assessor selects a Range of values for each of the three input components of Target, Size and Probability of Failure. The Ranges are entered on either the manual calculator or software application to calculate a Risk of Harm.

The Risk of Harm is expressed as a probability and is rounded, to one significant figure. Any Risk of Harm that is lower than 1/1 000 000 is represented as <1/1 000 000. As a visual aid, the Risk of Harm is colour coded using the traffic light system illustrated in Table 4 (page 7).

Risk of Harm - Monte Carlo Simulations

The Risk of Harm for all combinations of Target, Size and Probability of Failure Ranges has been calculated using Monte Carlo simulations[6]. The QTRA Risk of Harm is the mean value from each set of Monte Carlo results.

In QTRA Version 5, the Risk of Harm should not be calculated without the manual calculator or software application.

Assessing Groups and Populations of Trees

When assessing populations or groups of trees, the highest risk in the group is quantified and if that risk is tolerable, it follows that risks from the remaining trees will also be tolerable, and further calculations are unnecessary. Where the risk is intolerable, the next highest risk will be quantified, and so on until a tolerable risk is established. This process requires prior knowledge of the tree manager's risk tolerance.

Accuracy of Outputs

The purpose of QTRA is not necessarily to provide high degrees of accuracy, but to provide for the quantification of risks from falling trees in a way that risks are categorised within broad ranges (Table 4).

4. Information Management Decisions

Balancing Costs and Benefits of Risk Control

When controlling risks from falling trees, the benefit of reduced risk is obvious, but the costs of risk control are all too often neglected. For every risk reduced there will be costs, and the most obvious of these is the financial cost of

[6] For further information on the Monte Carlo simulation method, refer to http://en.wikipedia.org/wiki/Monte_Carlo_method

implementing the control measure. Frequently overlooked is the transfer of risks to workers and the public who might be directly affected by the removal or pruning of trees. Perhaps more importantly, most trees confer benefits, the loss of which should be considered as a cost when balancing the costs and benefits of risk control.

When balancing risk management decisions using QTRA, consideration of the benefits from trees will usually be of a very general nature and not require detailed consideration. The tree manager can

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consider, in simple terms, whether the overall cost of risk control is a proportionate one. Where risks are approaching 1/10 000, this may be a straightforward balancing of cost and benefits. Where risks are 1/10 000 or greater, it will usually be appropriate to implement risk controls unless the costs are grossly disproportionate to the benefits rather than simply disproportionate. In other words, the balance being weighted more on the side of risk control with higher associated costs.

Considering the Value of Trees

It is necessary to consider the benefits provided by trees, but they cannot easily be monetised and it is often difficult to place a value on those attributes such as habitat, shading and visual amenity that might be lost to risk control.

A simple approach to considering the value of a tree asset is suggested here, using the concept of 'average benefits'. When considered against other similar trees, a tree providing 'average benefits' will usually present a range of benefits that are typical for the species, age and situation. Viewed in this way, a tree providing 'average benefits' might appear to be low when compared with particularly important trees – such as in Figure 2, but should nonetheless be sufficient to offset a Risk of Harm of less than 1/10 000. Without having to consider the benefits of risk controls, we might reasonably assume that below 1/10 000, the risk from a tree that provides 'average benefits' is ALARP.

In contrast, if it can be said that the tree provides lower than average benefits because, for example, it is declining and in poor physiological condition, it may be necessary to consider two further elements. Firstly, is the Risk of Harm in the upper part of the Tolerable Region, and secondly, is the Risk of Harm likely to increase before the next review because of an increased Probability of Failure. If both these conditions apply then it might be appropriate to consider the balance of costs and benefits of risk reduction in order to determine whether the risk is ALARP. This balance requires the tree manager to take a view of both the reduction in risk and the costs of that reduction.

Lower Than Average Benefits from Trees

Usually, the benefits provided by a tree will only be significantly reduced below the 'average benefits' that are typical for the species, age and situation, if the life of the benefits is likely to be shortened, perhaps because the tree is declining or dead. That is not to say that a disbenefit, such as undesirable shading, lifting of a footpath, or restricting the growth of other trees, should not also be considered in the balance of costs and benefits.

The horse chestnut tree in Figure 3 has recently died, and over the next few years, may provide valuable habitats. However, for this tree species and the relatively fast rate at

which its wood decays, the lifetime of these benefits is likely to be limited to only a few years. This tree has an already reduced value that will continue to reduce rapidly over the coming five to ten years at the same time as the Risk of Harm is expected to increase. There will be changes in the benefits provided by the tree as it degrades. Visual qualities are likely to reduce while the decaying wood provides habitats for a range of species, for a short while at least. There are no hard and fast measures of these benefits and it is for the tree manager to decide what is locally important and how it might be balanced with the risks.

Where a risk is within the Tolerable Region and the tree confers lower than average benefits, it might be appropriate to consider implementing risk control while taking account of the financial cost. Here, VOSL can be used to inform a decision on whether the cost of risk control is proportionate. Example 3 below puts this evaluation into a tree management context.

There will be occasions when a tree is of such minimal value and the monetary cost of risk reduction so low that it might be reasonable to further reduce an already relatively low risk. Conversely, a tree might be of such considerable value that an annual risk of death greater than 1/10 000 would be deemed tolerable.

Occasionally, decisions will be made to retain elevated risks because the benefits from the tree are particularly high or important to stakeholders, and in these situations, it might be appropriate to assess and document the benefits in some detail. If detailed assessment of benefits is required, there are several methodologies and sources of information (Forest Research 2010).

Delegating Risk Management Decisions

Understanding of the costs with which risk reduction is balanced can be informed by the risk assessor's knowledge, experience and on-site observations, but the risk management decisions should be made by the tree manager. That is not to say that the tree manager should review and agree every risk control measure, but when delegating decisions to surveyors and other staff or advisors, tree managers should set out in a policy, statement or contract, the principles and perhaps thresholds to which trees and their associated risks will ordinarily be managed.

Based on the tree manager accepting the principles set out in the QTRA Practice Note and or any other specific instructions, the risk assessor can take account of the cost/benefit balance and for most situations will be able to determine whether the risk is ALARP when providing management recommendations.

Table 4. QTRA Advisory Risk Thresholds

Thresholds	Description	Action
	Unacceptable Risks will not ordinarily be tolerated	· Control the risk
1/1 000	**Unacceptable** (where imposed on others) Risks will not ordinarily be tolerated	· Control the risk · Review the risk
	Tolerable (by agreement) Risks may be tolerated if those exposed to the risk accept it, or the tree has exceptional value	· Control the risk unless there is broad stakeholder agreement to tolerate it, or the tree has exceptional value · Review the risk
1/10 000	**Tolerable** (where imposed on others) Risks are tolerable if ALARP	· Assess costs and benefits of risk control · Control the risk only where a significant benefit might be achieved at reasonable cost · Review the risk
1/1 000 000	**Broadly Acceptable** Risk is already ALARP	· No action currently required · Review the risk

QTRA Informative Risk Thresholds

The QTRA advisory thresholds in Table 4 are proposed as a reasonable approach to balancing safety from falling trees with the costs of risk reduction. This approach takes account of the widely applied principles of ALARP and ToR, but does not dictate how these principles should be applied. While the thresholds can be the foundation of a robust policy for tree risk management, tree managers should make decisions based on their own situation, values and resources. Importantly, to enable tree assessors to provide appropriate management guidance, it is helpful for them to have some understanding of the tree owner's management preferences prior to assessing the trees.

A Risk of Harm that is less than 1/1 000 000 is Broadly Acceptable and is already ALARP. A Risk of Harm 1/1 000 or greater is unacceptable and will not ordinarily be tolerated. Between these two values, the Risk of Harm is in the Tolerable Region of ToR and will be tolerable if it is ALARP. In the Tolerable Region, management decisions are informed by consideration of the costs and benefits of risk control, including the nature and extent of those benefits provided by trees, which would be lost to risk control measures.

For the purpose of managing risks from falling trees, the Tolerable Region can be further broken down into two sections. From 1/1 000 000 to less than 1/10 000, the Risk of Harm will usually be tolerable providing that the tree confers 'average benefits' as discussed above. As the Risk of Harm approaches 1/10 000 it will be necessary for the tree manager to consider in more detail the benefits provided by the tree and the overall cost of mitigating the risk.

A Risk of Harm in the Tolerable Region but 1/10 000 or greater will not usually be tolerable where it is imposed on others, such as the public, and if retained, will require a more detailed consideration of ALARP. In exceptional circumstances a tree owner might choose to retain a Risk of Harm that is 1/10 000 or greater. Such a decision might be based on the agreement of those who are exposed to the risk, or perhaps that the tree is of great importance. In these circumstances, the prudent tree manager will consult with the appropriate stakeholders whenever possible.

5. EXAMPLE QTRA CALCULATIONS AND RISK MANAGEMENT DECISIONS

Below are three examples of QTRA calculations and application of the QTRA Advisory Thresholds.

Example 1.

	Target		Size		Probability of Failure		Risk of Harm
Range	6	x	1	x	3	=	<1/1 000 000

Example 1 is the assessment of a large (Size 1), unstable tree with a probability of failure of between 1/100 and >1/1 000 (PoF 3). The Target is a footpath with less than one pedestrian passing the tree each week (Target 6). The Risk of Harm is calculated as less than 1/1 000 000 (green). This is an example of where the Target is so low consideration of the structural condition of even a large tree would not usually be necessary.

Example 2.

	Target		Size		Probability of Failure		Risk of Harm
Range	1	x	4	x	3	=	1(2T)/50 000

In Example 2, a recently dead branch (Size 4) overhangs a busy urban high street that is on average occupied constantly by two people, and here Multiple Target occupation is considered.

Having an average occupancy of two people, the Risk of Harm 1(2T)/50 000 (yellow) represents a twofold increase in the magnitude of the consequence and is therefore equivalent to a Risk of Harm 1/20 000 (yellow). This risk does not exceed 1/10 000, but being a dead branch at the upper end of the Tolerable Region it is appropriate to consider the balance of costs and benefits of risk control. Dead branches can be expected to degrade over time with the probability of failure increasing as a result. Because it is dead, some of the usual benefits from the branch have been lost and it will be appropriate to consider whether the financial cost of risk control would be proportionate.

Example 3.

	Target		Size		Probability of Failure		Risk of Harm
Range	3	x	3	x	3	=	1/500 000

In Example 3, a 200mm diameter defective branch overhangs a country road along which travel between 470 and 48 vehicles each day at an average speed of 50kph (32mph) (Target Range 3). The branch is split and is assessed as having a probability of failure for the coming year of between 1/100 and 1/1 000 (PoF Range 3). The Risk of Harm is calculated as 1/500 000 (yellow) and it needs to be considered whether the risk is ALARP. The cost of removing the branch and reducing the risk to Broadly Acceptable (1/1 000 000) is estimated at $670. To establish whether this is a proportionate cost of risk control, the following equation is applied. $3 800 000 (VOSL) x 1/500 000 = $7.6 indicating that the projected cost of $670 would be disproportionate to the benefit. Taking account of the financial cost, risk transfer to arborists and passers-by, the cost could be described as being grossly disproportionate, even if accrued benefits over say ten years were taken into account.

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Appendix b: Australian Standard for Pruning of Amenity Trees AS 4373-2007
Figure 1a Final cut location for branch removal at the branch collar

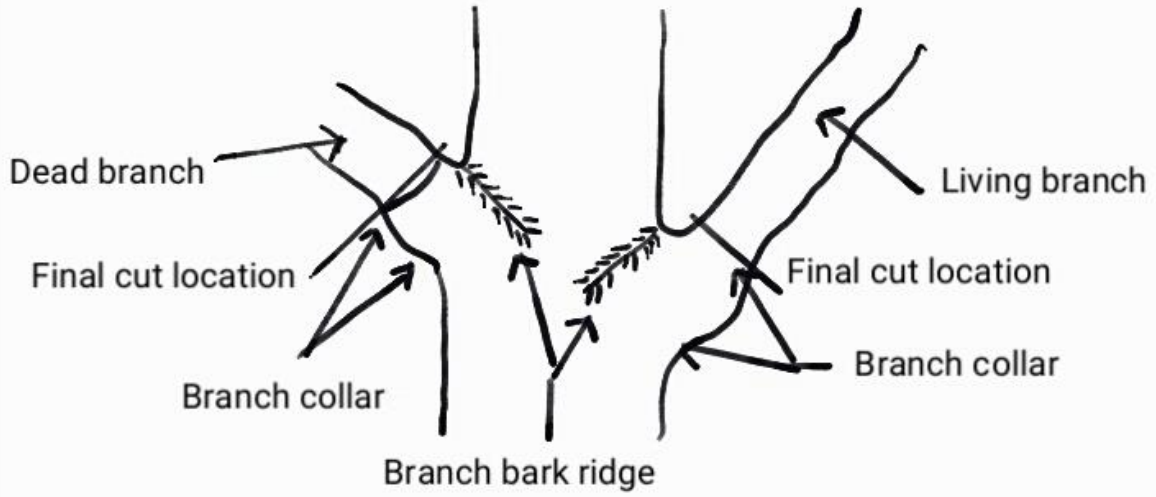
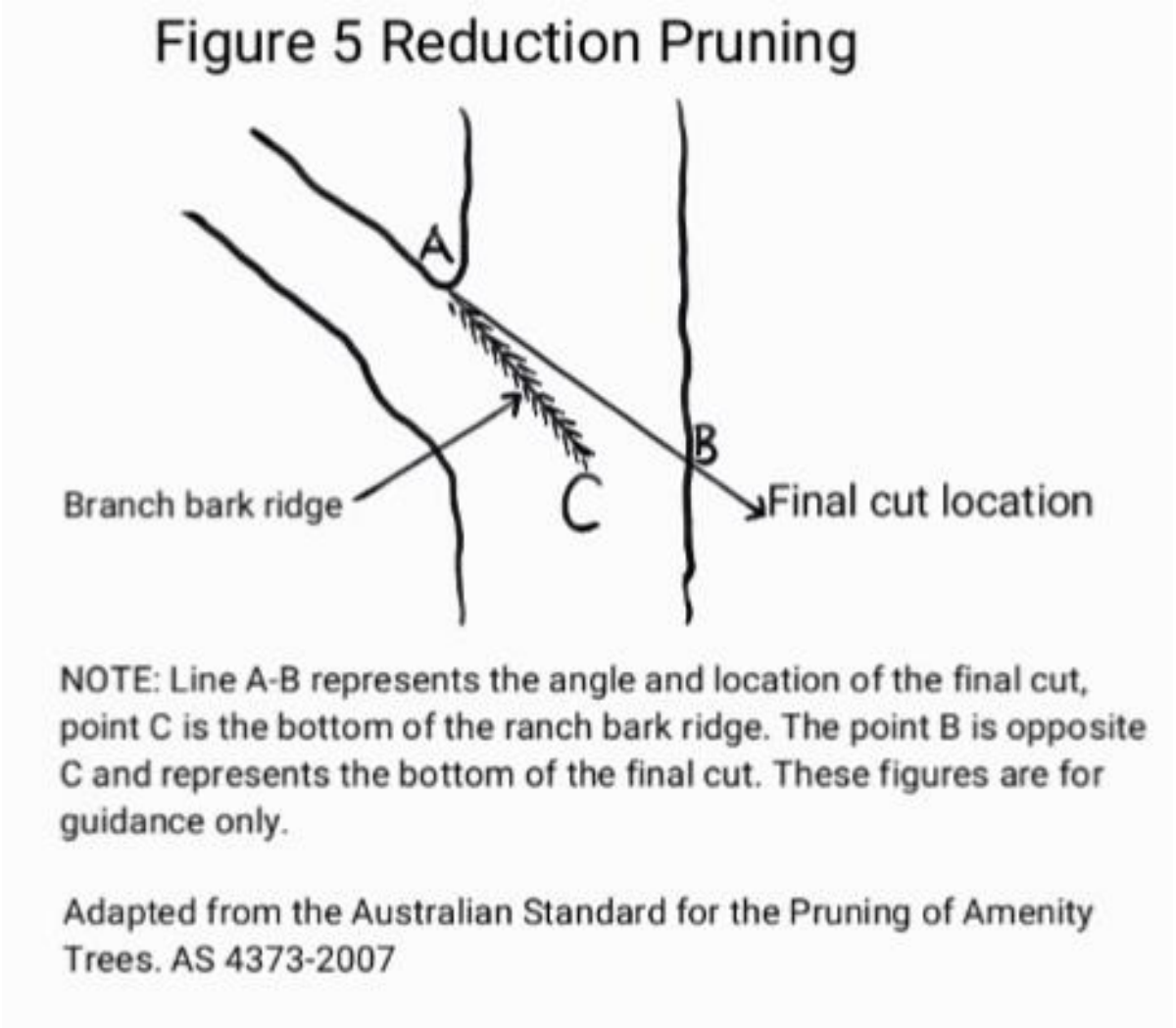


Figure 1a Final cut location for branch removal at the branch collar. Dead branches should be cut as close to the branch collar as possible without damaging live tissue. When removing living branches use the branch collar as a guide. If the branch collar is not visible use the branch bark ridge as shown above. Adapted from the Australian Standard for Pruning of Amenity Trees AS 4373-2007.

Appendix c: Australian Standard for Pruning of Amenity Trees AS 4373-2007
Figure 5 Final cut location for reduction pruning cuts



NOTE: Line A-B represents the angle and location of the final cut, point C is the bottom of the ranch bark ridge. The point B is opposite C and represents the bottom of the final cut. These figures are for guidance only.

Adapted from the Australian Standard for the Pruning of Amenity Trees. AS 4373-2007

APPENDIX 7: ENFORCEABLE UNDERTAKINGS

CONSTRUCTION

TOGETHER WE BUILD SUCCESS

ENFORCEABLE UNDERTAKING BY PCL CONSTRUCTORS PACFIC RIM PTY LTD ACN 140 877 792 TO THE DEPARTMENT OF PLANNING AND ENVIRONMENT FOR THE PURPOSES OF SECTION 9.5 OF THE *ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979* (NSW)

Lots 17 and 18 in Deposited Plan 753081, and any Crown land and road reserves within the project site also referred to as "West Wyalong Solar farm"

Enforceable Undertaking

To:

Secretary, Department of Planning and Environment 4 Parramatta Square, 12 Darcy Street, Parramatta NSW 2150

This enforceable undertaking (**Undertaking**) is given under section 9.5 of the *Environmental Planning and Assessment Act 1979* (NSW) (**EP&A Act**) by PCL Constructors Pacific Rim Pty Ltd (ACN 140 877 792) (**PCL**)

1. Person Giving the Undertaking

This Undertaking is given to the Secretary, Department of Planning and Environment (**the Secretary**) by PCL for the purposes of s 9.5 of the EP & A Act.

2. Background

(a) On 28 November 2019 the Secretary for Planning and Public Spaces granted consent for the SSD 9504 Development Application (**the Consent**) submitted by Lightsource Development Services Australia Pty Ltd for the West Wyalong Solar Farm (**Development**).

(b) A Heritage Management Plan (**HMP**) was completed for the Development on the 19 October 2020 by Artefact Heritage Services Pty Ltd. The HMP included information on the identification of areas of cultural significance within the Development area.

(c) On 11 February 2021, an Engineering Procurement and Construction Contract (**the Contract**) was entered into, by a related body corporate of Lightsource Development Services Australia Pty Ltd , the West Wyalong Fund Pty Ltd and PCL (**the EPC Contractor**). The Contract confers responsibility for control and management of the Development to the EPC Contractor, this includes ensuring compliance with conditions of the Consent and management plans.

(d) On 11 October 2021 the Department of Planning and Environment (**the Department**) issued PCL with a Show Cause Notice alleging that PCL committed an offence against section 4.2(1)(b) of the EP & A Act by carrying out a development not in accordance with the conditions of Consent.

3. The Incident

1.1 Conditions 19 and 20 of the Consent for the Development, provide:

Condition 19.

> The Applicant must ensure the development does not cause any direct or indirect impacts on the Aboriginal heritage items identified in Table 1 of Appendix 3 or located outside the approved development footprint.
>
> Condition 20.
>
> Prior to commencing construction, the Applicant must prepare a Heritage Management Plan for the development to the satisfaction of the Secretary….Following the Secretary's approval, the Applicant must implement the Heritage Management Plan.

1.2 Table 1 of Appendix 3 of the Consent entitled 'Aboriginal heritage items – avoid impacts' listed the following sites that were to be avoided:

Item Name	AHIMS Number	Item type
WWSF Bee Tree	43-4-0058	Scarred tree
WWSF AS01 Artefact Scatter	43-4-0057	Artefact Scatter

1.3 The HMP provided that risks of impact to the sites listed in Table 1 could be avoided throughout the Development by employment of certain measures, including:

> Prior to the commencement of construction an arborists report must be completed to advise the suitable size for an archaeological NO GO ZONE to be established around WWSF Bee Tree AHIMS ID 43-4- 0058 to ensure its long term viability in protecting it from unintended impacts to the tree or its root system.
>
> These archaeological NO GO ZONES must be established before the commencement of works. Access to archaeological NO GO ZONES is to be restricted to Project staff who have received site specific heritage induction training, or persons under their direct supervision.

1.4 At approximately 12.30pm on 23 August 2021 the PCL representative overseeing the removal of vegetation pursuant to the Biodiversity Management Plan for the Development erroneously directed an operator to remove some trees. These trees were in proximity to a culturally modified Bee Tree, WWSF Bee Tree AHIMS ID 43-4-0058 (**the Bee Tree**). The excavator operator had commenced felling the trees.

1.5 The PCL representative moved on to identify the next stand of trees to be removed. At this time the PCL representative's GPS has recalibrated and they realised that the previous location, where felling of trees had commenced, was incorrect and included trees that were not to be felled. The PCL representative contacted the Construction Manager to confirm the tree locations and returned to stop the excavator operator. The operations stopped.

1.6 When the Construction Manager attended the location, he was shown by the PCL representative the trees that had been felled and it was identified that the Bee Tree was one of the trees that had been felled.

The Immediate response to the Incident

1.7 After the incident occurred PCL implemented the procedure outlined in the HMP for unexpected finds. The Construction Manager called the Construction Project Manager to inform him of the incident that had occurred. The Construction Project Manager contacted the West Wyalong Fund Pty Ltd, otherwise known as the Principal, to inform them of the incident. In accordance with the protocol agreed between PCL and the Principal, the Principal then contacted the Department and Heritage NSW to report the incident.

1.8 PCL undertook an investigation of the incident to ensure the incident would not occur again and in accordance with the unexpected finds procedure in the HMP, the area was barricaded with an exclusion zone (temporary fencing/signage).

1.9 On 30 August 2021 a site meeting and inspection was conducted with the West Wyalong Aboriginal Land Council, a Heritage Consultant from Artefact Heritage, an Arborist and personnel from both PCL and the Principal. After that site meeting, a rehabilitation management plan was developed and implemented for the Bee Tree.

1.10 The Bee Tree was hoisted back into place and earth replaced around its roots. The tree was the subject of ongoing assessment and care. The tree was monitored by an Arborist. The cultural scar on the tree was not damaged.

1.11 The Bee Tree was monitored weekly by an arborist, unfortunately on 27 January 2022 the arborist declared the Bee Tree was dead.

1.12 On the 4 February 2022, the Principal notified the West Wyalong Aboriginal Land Council, heritage consultant and the Department that the Bee Tree was dead.

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4. Commencement of this Undertaking

This Undertaking comes into effect when:

(a) this Undertaking is executed by PCL, and

(b) this Undertaking so executed is accepted by the Secretary or delegate.

(**Commencement Date**).

---

5. Undertaking

PCL hereby undertakes as follows and will in respect of the Bee Tree:

Remedial actions

As the Bee Tree is no longer alive the heritage remediation actions to be undertaken by PCL, at PCL's own cost, as recommended by West Wyalong Aboriginal Land Council (**WWALC**) and heritage consultant are the following:

(a) preserve the cultural scar of the Bee Tree by having a cultural heritage salvage specialist remove the portion of the Bee Tree that contains the cultural scar at PCL's own cost;

(b) treat the removed portion of the Bee Tree that contains the cultural scar as directed by WWALC and the cultural heritage salvage specialist to ensure the preservation of the cultural scar at PCL's own cost;

(c) once the portion of the Bee Tree that contains the cultural scar has been appropriately treated, transport the portion of the Bee Tree that contains the cultural scar as directed by WWALC and the cultural heritage salvage specialist to the WWLAC memorial as directed by WWLAC at PCL's own cost;

(d) undertake upgrade works of the memorial area as directed by WWALC, which includes the following at PCL's own cost:

(i) Clearing, grubbing and placement of pavement to the WWLAC memorial area. This work will be procured by the WWLAC and funded by PCL;

(e) fence the location of Bee Tree that still contains artefact scatter (WWSF AS01 AHIMS ID 43-4-0057) at PCL's own cost;

(f) implement further training of PCL on-Site staff in consultation with the WWALC at PCL's own cost; and

(g) review all PCL policies and procedures in relation to the protection of items of cultural heritage at PCL's own cost.

Each of the above steps in (a) to (g) must be completed by PCL within 12 months from the Commencement Date, unless agreed upon by DPIE and PCL.

Reporting

(h) PCL must provide a monthly update of the progress in complying with the obligations under this Undertaking to the Secretary within 7 days of the end of each month until such time as the Secretary agrees in writing that PCL has met its obligations (excluding reporting obligations under sub clause (i)) under this Undertaking.

(i) In addition to the monthly update, an audit report is to be submitted once PCL believes they have met their obligations under the Undertaking, which must:

(i) be conducted by a suitably qualified, experienced and independent cultural heritage expert which has been mutually agreed to by PCL, the Department and WWLAC;

(ii) assess the works undertaken by PCL and whether they comply with the requirements of this Undertaking;

(iii) recommend any measures or actions to improve the cultural heritage performance of the works to be carried out under this Undertaking provided that such measures or actions cannot require PCL to undertake works of a materially greater scope than those works required by this Undertaking, including timeframes for recommendation implementation; and

(iv) produce a report on the outcomes of the Audit, which must be submitted to the Secretary by within 14 days of completion of the audit (Audit Report).

(j) Within 3 months of the submission of the Audit Report, PCL must submit a Response to any recommendations made within that report.

(k) PCL must comply with any reasonable requirement of the Secretary that results from a review of the Audit Report, which may include, but is not limited to implementing the Audit Recommendations.

(l) In the event that an action specified in this Undertaking cannot be achieved in the timeframe indicated, PCL undertakes to notify the Secretary of the delay, or anticipated delay, and the reason for such delay as soon as reasonably practicable. Notification of any such delay or potential delay does not in any way affect PCL's responsibilities under this Undertaking.

In addition to the monthly update, an audit report is to be submitted by PCL within 6 months following completion of the Remedial Actions in (a) to (g) above.

6. Acknowledgments

PCL acknowledges that:

(a) the Secretary and/or the Department will make this Undertaking publicly available including by publishing it on the Department's public register of section 9.5 undertakings on its website.

(b) the Secretary and/or the Department will, from time to time, make public reference to this Undertaking including in news media statements and in Department's publications.

(c) this Undertaking in no way derogates from the rights and remedies or liabilities available to or affecting any other person arising from or associated with the subject matter of this Undertaking.

(d) The events that led to the destruction of the Bee Tree and the harm caused to the Bee Tree may constitute offences under numerous legislative provisions including:

- The *Environmental Planning and Assessment Act 1979*;
- The *National Parks and Wildlife Act 1974*.

In the preparation of this Undertaking there has been consultation with the Department of Energy, Industry and Compliance as well as Department of Biodiversity, Conservation such that it is the intention that in the exercise of their discretions as to whether there ought to be separate proceedings commenced by other Government agencies in respect of those events or that harm, this Undertaking is intended to be a relevant consideration against taking such proceedings or action.

7. Execution page

Executed as an Enforceable Undertaking

Executed by **PCL Constructors Pacific Rim Pty Ltd ACN 140 877 792** in accordance with s 127(1) and s 127(3) of the *Corporations Act 2001*:

.....
Signature of Director

GOPINATH GOVINDRAJ
.....
Print full name

.....
Signature of Director/Company Secretary

Ryan O'Connell
.....
Print full name

Accepted by the Secretary of the Department of Planning and Environment pursuant to section 9.5 of the *Environment Planning and Assessment Act 1979* (NSW):

Date 3.06.2022

and signed on behalf of the Department:

Ben Harrison
.....
Print full name

Secretary or his Delegate

8. Annexure 1 Development Consent

Enforceable Undertakings Documents
Password: jjAjMp2H
https://pcl.egnyte.com/fl/pjndQmBxj8

9. Annexure 2 Heritage Management Plan

Enforceable Undertakings Documents
Password: jjAjMp2H
https://pcl.egnyte.com/fl/pjndQmBxj8

10. Annexure 3 Arborist Report

Enforceable Undertakings Documents
Password: jjAjMp2H
https://pcl.egnyte.com/fl/pjndQmBxj8

11. Annexure 4 Show Cause Notice

Enforceable Undertakings Documents
Password: jjAjMp2H
https://pcl.egnyte.com/fl/pjndQmBxj8

12. Annexure 5 LALC Memorial Paving Area

artefact

Artefact Heritage

ABN 73 144 973 526
Level 4, Building B
35 Saunders Street
Pyrmont NSW 2009
Australia

+61 2 9518 8411
office@artefact.net.au
www.artefact.net.au