



Historic Heritage Management Plan

Executive Summary

This Historic Heritage Management Plan (HHMP) addresses the historical (non-Aboriginal) heritage and archaeological management issues associated with the United Wambo Open Cut Coal Mine (United Wambo) Project. The management of Aboriginal cultural heritage is addressed by the United Wambo Aboriginal Cultural Heritage Management Plan (ACHMP). Both the ACHMP and HHMP will form an overall Heritage Management Plan (HMP) for the Project.

The purpose of this HHMP is to provide a description of the measures to be implemented by United Wambo to manage and protect known heritage values within and in the vicinity of Project Area. The key historic heritage management and mitigation measures to be implemented at United Wambo are included in **Table 1**.

Table 1: Historic Heritage Management and Mitigation Measures

No.	Mitigation/Management Measure	Timing	Section
1	A detailed survey and photographic/archival recording of the dog-leg fence will be undertaken in accordance with Heritage Branch guidelines <i>Photographic Recording of Heritage Items Using Film or Digital Capture</i> (2006) within two years of commencement of development under project consent.	Within two years of commencement of development under project consent	Section 8.5.1
2	As part of the archival recording of the dog-leg fence, additional research will be undertaken to identify (if the information is available) an exact date of construction and who may have built the fence, as well as to confirm the preliminary assessment of the fence as State significant.	Within two years of commencement of development under project consent	Section 8.5.1
3	The archival record will be submitted to the Department of Planning and Environment, the Heritage Council, and the relevant local Council libraries.	Within two years of commencement of development under project consent	Section 8.5.1
4	In addition to the detailed recording, an interpretation strategy will be developed for the dog-leg fence.	Within two years of commencement of development under project consent	Section 8.5.1
5	The interpretation strategy will be developed in consultation with the NSW Heritage Council and in accordance with relevant Heritage Council guidelines including: <i>Interpreting Heritage Places and Items Guidelines</i> (2005); and <i>Heritage Interpretation Policy</i> (2005). The interpretation strategy will also involve and be informed by consultation with the community, local historical society and Singleton Council.	Within two years of commencement of development under project consent	Section 8.5.1

No.	Mitigation/Management Measure	Timing	Section
6	As part of this interpretation strategy, a plan to salvage, reconstruct and public display a section of the dog-leg fence will be developed. Consideration will be given to the feasibility of salvaging the stone blocks of the fence and combining these with logs cut from within the Project Area, when it is cleared as part of site preparation works for the open cut. The strategy will assess the potential location of the reconstructed fencing, including at the entrance to the mine site or within a community space/park in Jerrys Plains or Warkworth.	Within two years of commencement of development under project consent	Section 8.5.1
7	Prior to the commencement of works that impact on the former house site, including ground preparation/clearing works, archaeological investigation of the former House Site will be undertaken to normal professional standards.	Prior to the commencement of works that impact on the former house site	Section 8.5.2
8	Following the completion of archaeological works, a copy of the final excavation report(s) will be lodged with the Heritage Council of NSW, the local Council, and the DPE.	Prior to the commencement of works that impact on the former house site	Section 8.5.2
9	A detailed photographic archival recording of the shearing shed and creamery will be undertaken in accordance with Heritage Branch guidelines <i>Photographic Recording of Heritage Items Using Film or Digital Capture</i> (2006) prior to any physical impacts occurring to the item.	Completed 27 March 2020, with blasting in the United Pit commencing on 6 April 2020.	Section 8.5.3
10	The archival record will be submitted to DPE, the Heritage Council, and the relevant local Council libraries.	Submitted to DPIE, Heritage Council and Singleton Council July 2020.	Section 8.5.3
11	Prior to the commencement of works that impact on this site, including ground preparation/clearing works, archaeological investigation of the shearing shed and creamery will be undertaken to normal professional standards.	Prior to the commencement of works that impact on the shearing shed and creamery site	Section 8.5.3
12	Following the completions of archaeological works, a copy of the final excavation report(s) will be lodged with the Heritage Council of NSW, the local Council, and the DPE.	Prior to the commencement of works that impact on the shearing shed and creamery site	Section 8.5.3
13	As a result of the property's susceptibility to damage from ground vibration a photographic/archival recording of the Shearing Shed on the Montrose property will be undertaken	Completed 27 March 2020.	Section 8.6.1

No.	Mitigation/Management Measure	Timing	Section
	in accordance with Heritage Branch guidelines <i>Photographic Recording of Heritage Items Using Film or Digital Capture</i> (2006) prior to any blasting being undertaken as part of the Project that may exceed 5 mm/s.		
14	As part of the archival recording, further research will also be undertaken of the Montrose property, to better understand the history of occupation and use of the property.	Completed 27 March 2020.	Section 8.6.1
15	The archival record will be submitted to DPE, the Heritage Council, and the relevant local Council libraries.	Submitted to DPIE, Heritage Council and Singleton Council 24 July 2020.	Section 8.6.1
16	Subject to discussions with the landowner, United Wambo will undertake an inspection of the former Warkworth Public School prior to commencement of the Project. Regular inspections will also be undertaken to confirm that no damage has occurred due to the Project at the former Warkworth Public School.	Baseline assessment completed 25 May 2020 Inspections to continue regularly.	Section 8.6.2
17	An historic heritage induction is to be developed in consultation with a suitably qualified consultant. The induction is to be given to all relevant personnel (e.g. staff, contractors, visitors) prior to work commencing at or in the vicinity of listed or potential heritage items in or within the vicinity of the Project Area.	Included as part of the Site Inductions required by all personnel prior to working on site.	Section 8.8.1
18	Potential heritage items located within the Project Area, which will not be impacted by the Project, must be appropriately fenced during the course of any works being undertaken within 100 m of the potential items, to avoid incidental physical impacts. Appropriate fencing would include chainmesh or similar, or orange safety mesh fencing or similar. The installation of fencing should not result in any physical impacts to the potential items or their associated fabric. The installation of complementary, appropriate and informative signage to any fencing erected is recommended. The signage would act to inform workers and users of the area of the purpose of the fencing and identify the relevant personnel to be contacted in the event that incidental impacts to the potential item(s) occur during the course of works.	As required	Section 8.8.2

No.	Mitigation/Management Measure	Timing	Section
19	A complete map showing the location of all listed and potential heritage items located within the Project Area is to be prepared prior to works commencing within the Project Area and to be provided to all relevant staff and contractors that will, or that have, the potential to work in the vicinity of these items	Included as part of the Site Inductions required by all personnel prior to working on site.	Section 8.8.2
20	If, during the course of works, any previously unknown historical archaeological material or heritage sites/items are uncovered or identified, all work in the area of the item(s) shall cease immediately and a qualified heritage consultant/archaeologist consulted. If the archaeologist considers the material uncovered constitutes an archaeological 'relic' or a heritage item, the Heritage Branch will be consulted in accordance with Section 146 of the Heritage Act 1977 (NSW), to determine an appropriate course of action prior to the recommencement of work in the area of the item.	As required	Section 8.8.3
21	In the event that a potential burial site or potential human skeletal remains are exposed in any area subject to surface disturbance or remediation works, the procedure in Section 8.8.4 is to be implemented in accordance with the <i>Policy Directive – Exhumation of Human Remains (NSW Department of Health 2008)</i> , <i>Skeletal Remains – Guidelines for the Management of Human Skeletal Remains</i> under the Heritage Act 1977 (NSW Heritage Office 1998) and the <i>Aboriginal Cultural Heritage Standards and Guidelines Kit</i> (NPWS 1997).	As required	Section 8.8.4
22	United Wambo's Environment & Community Manager will review blast monitoring results to assess whether there have been, or are likely to have been, any exceedances of the blast vibration criteria for each of the heritage items discussed in Section 6 . If recorded exceedances (or likely exceedances) are identified, the relevant heritage item must be inspected and potential impacts to the heritage item and any remediation works or further assessment that may be required, recorded. United Wambo's Environment & Community Manager will report to the Operations Manager, the results of any investigations of recorded exceedances or likely exceedances. The findings of these investigations, including an outline of required mitigation actions (if any), will be reported to United Wambo's senior management.	As required	Section 8.9.1
23	Compliance with the requirements of the development consent (including implementation of this Plan) will be reported in the Annual Review submitted to DPE as per the requirements set out in the development consent.	Annually	Section 8.9.2.1

No.	Mitigation/Management Measure	Timing	Section
24	Any breach of performance measures or recorded exceedance of vibration criteria at a heritage item identified in <i>Section 6</i> will be reported to the Planning Secretary in accordance with the requirements of the development consent.	As required	<i>Section 8.9.2.2</i>

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1. Project Description

The United Wambo Open Cut Coal Mine (United Wambo) is situated approximately 15 kilometres west of Singleton, near the village of Warkworth, New South Wales (*Figure 1-1*). United Wambo Joint Venture (United Wambo) is a 50:50 joint venture between neighbouring mines operated by United Collieries Pty Limited (United) and Wambo Coal Pty Limited (Wambo).

United is owned 95 per cent by Abelshore Pty Limited, a wholly owned subsidiary of Glencore Coal Pty Limited (Glencore) and 5 per cent by the Construction, Forestry, Mining and Energy Union (CFMEU), which is managed by Glencore. Wambo is a subsidiary of Peabody Energy Australia Pty Limited.

United Wambo combines the existing open cut operations at Wambo with a new open cut coal mine at United. United Wambo has approval to extract up to 10 million tonnes per annum (mtpa) of Run of Mine (ROM) coal from the combined Wambo Open Cut (Wambo Pit) and United Open Cut (United Pit). All coal is transported and processed through the Wambo Coal Handling and Processing Plant (CHPP) and transported by rail from Wambo to the Port of Newcastle for export.

Open cut mining is managed by United on behalf of the joint ventures, while Wambo manages the CHPP and train loading facilities as well as Wambo's continued underground operations.

Figure 1-2 shows an overview of the project and the project approval boundary for United Wambo.



Figure 1-1: Locality Plan

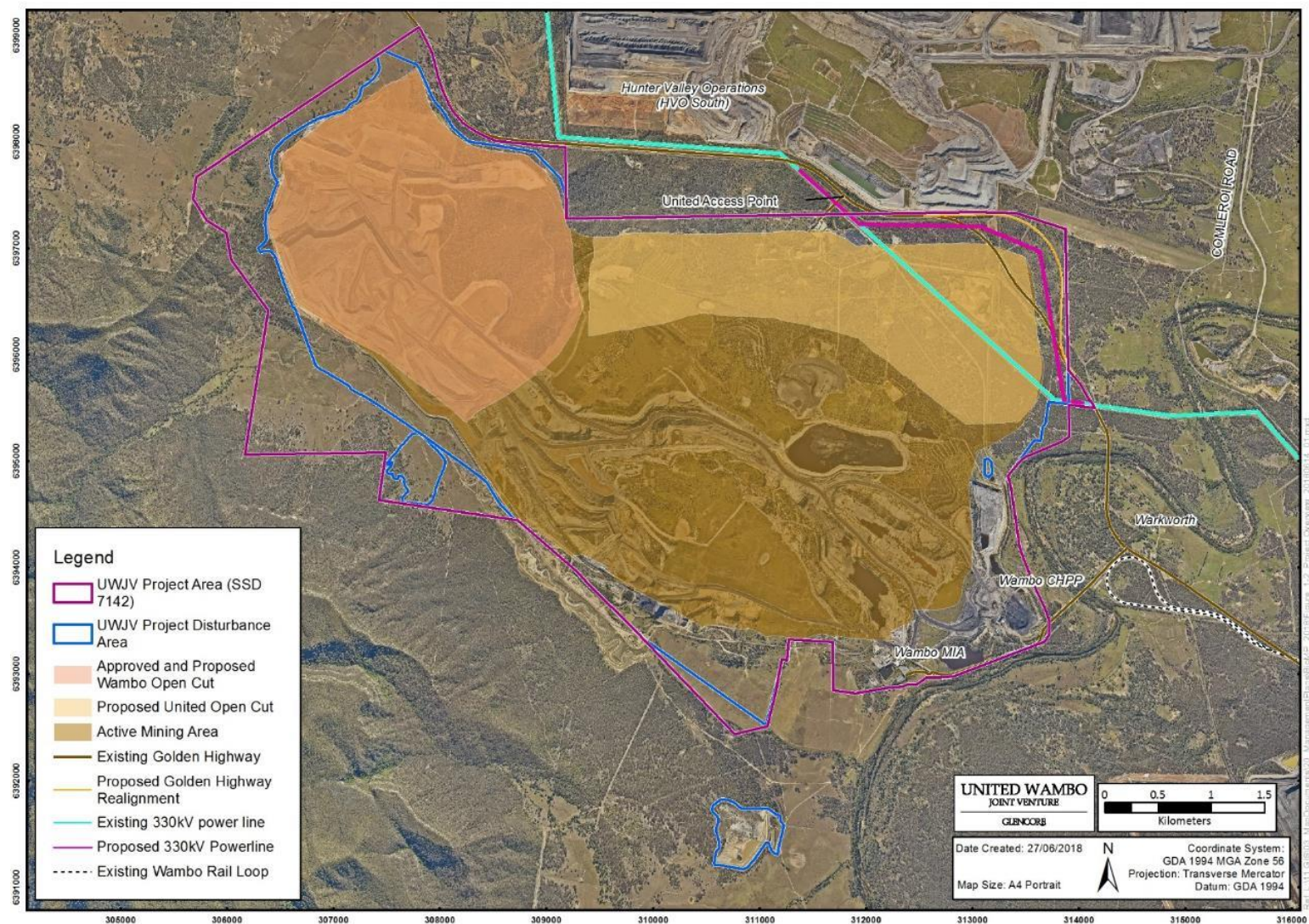


Figure 1-2: United Wambo Project Overview

2. Purpose

The Historic Heritage Management Plan (HHMP; the Plan) is to describe the management and mitigation strategies, procedures, and controls that will be implemented to manage historical (non-Aboriginal) heritage at United Wambo.

A heritage impact statement (HIS) for the Project was prepared by Umwelt in 2016 as part of an overarching Environmental Impact Statement (EIS) for the Project (also prepared by Umwelt in 2016). The purpose of the HIS was to identify all listed and potential heritage and historical archaeological items within, and in the vicinity of, the Project Area, assess the potential impacts that could occur to these items as a result of the Project and develop mitigation measures to avoid and/or minimise any impacts identified.

The HIS was submitted to the NSW Heritage Branch (Department of Premier and Cabinet) via the Department of Planning and Environment (DPE) for review and comment. In response to the outcomes of this process, as well as to address commitments made in the EIS and HIS and Condition B82 of SSD 7142, this HHMP has been prepared.

This Historic Heritage Management Plan (HHMP) has been prepared by Umwelt (Australia) Pty Limited (Umwelt) on behalf of United Wambo Joint Venture (herein referred to as 'United Wambo').

3. Scope

This HHMP addresses the historical (non-Aboriginal) heritage and archaeological management issues associated with the Project. It does not include a heritage management strategy with regards to Aboriginal cultural heritage. The management of Aboriginal cultural heritage will be addressed by a separate Aboriginal Cultural Heritage Management Plan. Both the ACHMP and HHMP will form an overall Heritage Management Plan (HMP) for the Project.

This HHMP applies to all activities conducted under SSD 7142, including Modification 1 (approved 24 November 2021) during Phase 2 of the Project.

The purpose of this HHMP is to provide a description of the measures to be implemented by United Wambo to manage and protect known heritage values within, and in the vicinity of, the Project Area. As already noted, this report has been prepared in response to the outcomes of consultation undertaken with the NSW Heritage Branch to date, as well as to address commitments made in the EIS and HIS prepared for the Project by Umwelt.

This report has been prepared with regards to the principles contained in *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance* 2013 (Australia ICOMOS 2013). It also draws on information provided by the Heritage Branch on the preparation of Conservation Management Plans (CMPs) and Conservation Management Strategies (CMSs) and '*Conservation Plan: a Guide to the Preparation of Conservation Plans for Places of European Cultural Significance*' (Kerr 2006).

4. Statutory Requirements

4.1 Environmental Planning and Assessment Act 1979

United Wambo received Development Consent (SSD 7142), in accordance with Part 4 of the Environmental Planning & Assessment Act 1979 (EP&A Act), from the NSW Independent Planning Commission (IPC) on 29 August 2019. Conditions within SSD 7142 relating to the management of historic heritage, and where these are addressed within this document, are provided in **Table 4-1**.

Table 4-1: SSD 7142 Requirements for Heritage Management

Condition	Condition Details	HHMP Section
B82	The Applicant must prepare a Historic Heritage Management Plan for the development in respect of all non-Aboriginal cultural heritage items, to the satisfaction of the Planning Secretary. This plan must:	
B82 (a)	be prepared by a suitably qualified and experienced person/s;	This plan has been prepared by Tim Adams and Karyn Virgin of Umwelt, both suitably qualified and experienced persons.
B82 (b)	be prepared in consultation with the Heritage Branch, Council and relevant landowners and in accordance with the relevant Heritage Branch guidelines;	Section 8.1 and Appendix A - Evidence of Consultation
B82 (c)	identify all heritage items in the vicinity of the site and include a statement of significance for each item;	Section 6 and Section 7
B82 (d)	include an interpretation strategy for the dog-leg fence that includes undertaking additional research, archival recording, salvage, reconstruction and public display within two years of commencement of development under this consent;	Section 8.5.1
B82 (e)	describe the measures to be implemented on the site or within any offset areas to:	
B82 (e) (i)	ensure all workers receive suitable heritage inductions prior to carrying out any activities which may cause impacts to historic heritage, and that suitable records are kept of these inductions;	Section 8.9.1
B82 (e) (ii)	prepare an archaeological research design and methodology prior to undertaking any necessary archaeological excavations;	Appendix B - Research Design and Methodology
B82 (e) (iii)	ensure that the archaeological excavations are undertaken by a suitably qualified and experienced archaeologist;	Appendix B - Research Design and Methodology This will be implemented at the time of investigation

Condition	Condition Details	HHMP Section
B82 (e) (iv)	undertake photographic/archival recording of any items of heritage significance potentially impacted by the development, prior to disturbance, including recording the views to and from the shearing shed and creamery;	<i>Section 8.5 and Section 8.7</i>
B82 (e) (v)	protect heritage items located outside the approved disturbance area from unpredicted impacts of the development and vandalism (where practicable); and	<i>Section 8.8.2</i>
B82 (e) (i)	manage any new heritage items discovered during the life of the development;	<i>Section 8.8.3 and Section 8.8.4</i>
B82 (f)	include a strategy for the care, control and storage of relics salvaged from any historical archaeological excavations, both during the life of the development and in the long term; and	<i>Appendix B -Research Design and Methodology, Section B.6</i>
B21 (j)	include a strategy to monitor, mitigate and manage the effects of blasting on heritage items, particularly those identified in the figure in Appendix 5, including undertaking baseline (i.e. pre-blasting) and ongoing risk-based dilapidation surveys (subject to landowner access arrangements).	<i>Table 6-1, Section 8.4 and Section 8.6</i>

As discussed, this HHMP only addresses historical (non-Aboriginal) heritage management measures and will form part of the overall HMP, addressing both Aboriginal cultural heritage and historical (non-Aboriginal) heritage.

4.2 Compliance with Previous Approvals

The existing Wambo mine development consents, DA 305-7-2003 and DA 177-8-2004, contain conditions relevant to historic heritage. Wambo maintains responsibility for these consents and, as such, the heritage conditions within these consents do not form part of this HHMP.

The previous United Collieries underground operation did not have a requirement to have a Historic Heritage Management Plan.

The Wambo HMP prepared in July 2018 notes that the management of the Wambo Complex is outlined in:

- The Wambo Homestead Complex Mine Management Plan (required under Schedule 4 Condition 57 of DA 305-7-2003); and
- The Wambo Homestead Complex Conservation Management Plan (required under Schedule 4 Condition 58 of DA 305-7-2003).

The Wambo HMP (July 2018), therefore, does not provide further management measures for the complex. The Wambo HMP identifies mitigation and management measures for all other historic heritage items recorded within the Wambo area and surrounds, as follows:

- abandoned Homestead A – Wambo Coal Pty Ltd (WCPL) to compile a photographic record of the site and submit this to the NSW Heritage Branch;

- “Whynot” Homestead – no mitigation measures considered necessary;
- abandoned Homestead B – item not to be affected by DA 305-7-2003;
- piggery and butcher’s hut – site protected during works to prevent accidental damage: no other mitigation measures considered necessary;
- aerial footing - no mitigation measures considered necessary;
- “Montrose” Homestead - no mitigation measures considered necessary;
- Roman Catholic Cemetery - no mitigation measures considered necessary;
- Old Anglican Cemetery - no mitigation measures considered necessary; and
- St Phillips Anglican Church and Cemetery - no mitigation measures considered necessary.

The Project is fully compliant with all the above-mentioned conditions and the content of the Wambo HMP. No aspect of the Project contravenes any of the identified conditions or management measures identified in the conditions of DA 305-7-2003 or the Wambo HMP.

4.2.1 Wambo Homestead Complex

As part of the 2016 HIS, it was determined that no additional management measures were required in relation to Wambo Homestead as part of the Project, with the existing management regime in place under the Wambo mine development consent providing for the ongoing effective management of the homestead. As discussed above, the existing management regime includes:

- adherence to an approved CMP;
- blast monitoring undertaken for any blasts located within two kilometres of the Wambo Homestead;
- review of blast records by a suitably qualified and experienced structural engineer; and
- annual inspections of the Wambo Homestead by the approved structural engineer.

Under the Joint Venture agreement between Wambo and United, United Wambo will be responsible for managing all aspects of the open cut mining operations. This will include implementing all relevant controls relating to Wambo Homestead that relate to open cut mining activities, being those described above. United Wambo will also implement blast controls and monitoring consistent with the existing management regime in place, including achievement of the relevant blasting criteria.

It is noted that the current approved vibration limit for the Homestead under consent DA305-7-2003 is 5 mm/s. The Blasting Impact Assessment prepared for the Project by Enviro Strata (Enviro Strata 2016) predicts potential vibration impacts to this item as a result of the Project to be fully compliant with this, being between 0.1 and 2.4 mm/s (refer to **Table 6-1**).

4.2.2 Springwood Homestead

The Springwood Homestead site is located approximately 640 metres outside, to the east of, the Project Area boundary, approximately two kilometres from the approved United Open Cut. The maximum predicted ground vibration level for Springwood is 2.2 mm/s; below the conservative vibration limit of 5 mm/s (refer **Section 8.4**). As such, there are not expected to be any direct or indirect impacts to Springwood.

The relevant CMP for Springwood Homestead (ERM 2015) has been reviewed as part of the preparation of this HHMP. Policy 9 of the CMP states:

“Where mining activities are proposed to occur within a one kilometre radius of Springwood Homestead, the potential impact on the place should be assessed in the form of a Heritage Impact Statement.”

As already noted, Springwood Homestead is located approximately two kilometres from the United Open Cut and, therefore, outside of the radius identified in the CMP. It is also noted that, despite the distance between the Open Cut and Springwood, the homestead was included within the 2016 HIS, with potential impacts to the site assessed. The 2016 HIS determined that the maximum predicted vibration to Springwood as a result of the Project (2.2mm/s) will be below the conservative vibration limit nominated for heritage items (5mm/s).

The Project is, therefore, fully compliant with the relevant CMP. It is noted, however, that if future works are proposed within one kilometre of the Homestead, a HIS will be required to assess the potential impact of any such works on the site.

5. Summary of the Historical Context

As part of NSW heritage assessment procedures, it is essential to have a full understanding of a site or item based on its historical and physical context. This section of the HHMP summarises the historical context of the Project Area prepared as part of the HIS (Umwelt 2016) to provide an understanding of the significance of any heritage items (listed or potential) within the Project Area. The 2016 assessment should be referred to for the full historical context of the Project.

The potential heritage resource of the Project Area generally reflects the documented history of the surrounding region (discussed in detail in the 2016 HIS), which indicates that the land has predominantly been utilised by graziers, agriculturalists and, in recent times, the mining industry.

The earliest land taken up in the vicinity of the Project Area was around what became the Wambo Estate; on land close to the first road to Windsor and the fertile river flats of Wollombi Brook and the Hunter River.

Mathew Hindson was the earliest settler in this area with 2,000 acres granted on 20th April 1824. David Maziere was granted 746 acres adjacent to Hindson’s grant on 14th November 1825. Hindson was a free settler who became a Sydney merchant and landowner in the Maitland and Wollombi districts. Maziere was another free settler, who arrived in NSW in 1822. He became a shareholder in the Bank of NSW and a wine and spirit merchant operating in George Street, Sydney (Collins 1994:8). Apart from some clearing works, which was a standard condition of land grants during this period, neither Hindson or Maziere appear to have developed their grants (GML 2010:41). By 1834, both Hindson and Maziere had sold their land to James Hale to form what later became Wambo Estate. Hale originally named the property Lemington Grange after the name applied to the parish (Lemington) by Assistant Colonial Surveyor Henry Dangar (GML 2010:41, Collins 1994:8).

Henry Dangar’s 1828 Map of the Hunter River and its branches (refer to Figure 3.1 of the 2016 HIS) shows the land on the west side of Wollombi Brook owned by Hindson (shown in blue and numbered '2' across the southern portion of the Project Area) and Maziere (shown in pink and numbered '3' immediately to the south of the Project Area).

Robert Dixon’s 1837 Map of the Colony of NSW illustrates the locations and size of some of the early allocations in the region of the Project Area (refer to Figure 3.2 of the 2016 HIS). By this time Hale had purchased Hindson and Mazieres’ grant to form what became Wambo Estate, shown across the southern portion of the Project Area. The 1837 Map also shows the extent of allocation of land along the Hunter River and its tributaries, including Wollombi Brook.

Figure 3.4 of the 2016 HIS shows Parish Maps of Lemington, Wambo, Warkworth and Whybrow as relevant to the Project Area, and also illustrates the locations and names of settlers subsequent to the early large landowners. The extensive area of red across the eastern portion of the Project Area relates to land that was reserved for a Travelling Stock Reserve in 1873. The Parish maps show other major landowners across the Project Area, including the Hobden family, the Allen family, Francis Parmeter Squire, Isaac Frith, C.H. and Lucy Dight, the Tudor family and Charles Durham.

The Project Area is located within a landscape that has been heavily cleared and disturbed over a long period of time, predominantly as a result of pastoral and agricultural activities dating from the 1800s. Further disturbance has occurred through the mining activities associated with the past open cut mines at Wambo and United, and the underground mining activities that have occurred throughout the Project Area. Prior to the establishment of mining operations, the Project Area had a long history of agricultural land uses, such as grazing and cultivation. Grazing and dairy operations are still widespread throughout the surrounding area, occurring at a number of properties along the Golden Highway and the outskirts of Jerrys Plains. Irrigated agriculture is currently being undertaken along the alluvial floodplains of the Hunter River to the north of the Golden Highway. A small number of olive groves and vineyards are also located south of Jerrys Plains.

A review of aerial photographs obtained from the Department of Lands, dating from 1963, was undertaken as part of the 2016 HIS and confirms that prior to 1963 substantial clearing had been undertaken in the Project Area, likely as a result of pastoral and agricultural expansion.

5.1 Mining

The development of coal resources comprises an important part of the region's history of coal mining within the Hunter Valley and began on a limited scale in the early 1900s, prior to a rapid expansion in the 1950s with the establishment of large open-cut mines (Dean-Jones and Mitchell 1993:2).

Coal was known to exist in Singleton and its surrounding areas since early exploration. It was originally found on the Wambo Estate in 1863. Coal was first mined in the Upper Hunter in the Rix's Creek area near Singleton in the 1860s (Rappoport 2006:24). On 23 September 1886, the 'Singleton News' in the Maitland Mercury reported that:

"Since Messrs Nowland opened up their mine, sinking for coal has been actively prosecuted on the Ravensworth estate and we learn that the perseverance of the promoters has been successful to such a degree that they intent to float the undertaking shortly into a company with equal capital of £50,000. A prospectus will be shortly issued.'

According to the Heritage Office and DUAP (1996:4) "coal was not commercially exploited until the 1890s in the Upper Hunter". Coal mining and electricity generation have become major industries in the Singleton area since the 1950s, with the first wave of collieries built to meet export demand at Liddell, Foybrook and Liddell State. Since the mid-twentieth century, coal mining operations "expanded from Cessnock/Maitland area to the triangle bounded by Singleton, Muswellbrook and Denman, using highly mechanised, open cut surface mining techniques in which all overburden is stripped from the surface" (Rappoport 2006:24).

In 1964, the State Electricity Commission commenced construction of the Liddell Power Station, which was commissioned in 1973. The Bayswater Power Station was commissioned in 1980. These projects changed the lifestyle of the residents of Muswellbrook, Singleton and surrounding local government areas by affecting employment, population, housing, commerce and the character of the locality. Through the 1970s, more than 10 major open cut mines commenced operation in the area.

5.1.1 United Collieries

An Authorisation to Prospect was granted over the United area in 1980. Development consent for mining within mining lease CL257 (now consolidated into CCL775) was granted in the early 1980s, with mining operations commencing in 1989.

From July 1989 until July 1992, United operated an open cut and auger mining operation extracting from the Whynot and Wambo seams. In 1991, a lease exchange was affected with the neighbouring Wambo-owned mine, which enabled Wambo to secure greater open cut reserves and United to secure greater underground reserves.

Underground mining operations commenced at United in January 1992 within the Woodlands Hill seam using a continuous miner with shuttle cars. In May 1994, board and pillar development using the 'Cut and Flit' mining system was introduced. Coal pillar extraction operations commenced in October 1995 using a continuous miner, shuttle cars and mobile roof supports. In late 1996, the mine expanded to two development units and one pillar extraction unit. In 1997, a chain haulage system was introduced to increase production from 1.8 million tonnes per annum (Mtpa) to 2.95 Mtpa. In May 2002, longwall mining was implemented at United. The majority of United underground mining operations lie beneath Wambo's open cut operations.

United has a CHPP at the site that was used to wash ROM coal for delivery to the export market. From 1989 until 2006, product coal was transported from United by road along the Golden Highway to the Mount Thorley Coal Loader. With the construction of the Wambo rail spur and loop in 2006, product coal from United was transported to the Wambo train loading facility initially via the Golden Highway until an internal haul road was completed in December 2007. The product coal was stockpiled at the rail load-out facility at Wambo and loaded onto trains, bound for the Port of Newcastle, for export.

In March 2010, the United site entered a period of Suspension of Operations and United subsequently commenced exploration and pre-feasibility works for future mining potential.

5.1.2 Wambo

A range of open cut and underground mining operations have been conducted at Wambo since mining operations commenced in 1969. Mining, under the current development consent DA 305-7-2003 (Wambo development consent), commenced in 2004 and existing open cut and underground operations are conducted under this consent. The approved ROM coal production rate is 14.7 Mtpa of ROM coal from the Wambo complex (open cut and underground operations combined). Product coal is transported from Wambo by train, with an approved rail capacity of 15 Mtpa of product coal under the Wambo train loading facility development consent (DA 177-8-2004).

The current approved Wambo Open Cut is authorised to produce up to 8 Mtpa of ROM coal from the Whybrow, Redbank Creek, Wambo and Whynot coal seams. The open cut is bounded by United mine and the Golden Highway to the east and north, Wollombi Brook to the east and south, and Wollemi National Park to the west.

The existing Wambo Open Cut is a truck and excavator operation. The open cut mining fleet includes excavators, dozers, front end loaders, haul trucks, water trucks, service trucks, graders and drills.

The existing Wambo Open Cut operates 24 hours per day, seven days per week. Blasting is currently approved between 9:00 am and 5:00 pm Monday to Saturday, inclusive. No blasting is allowed on Sundays, public holidays or any other time outside of these permitted hours without the written approval of the Environment Protection Authority (EPA). Wambo is currently approved to carry out a maximum of three blasts per day, unless an additional blast is required following a misfire, with a maximum of 15 blasts per week.

Wambo has four approved underground mining operations, being:

- North Wambo Underground Mine (completed);
- South Bates Underground Mine (currently operational); and
- South Wambo Underground (not yet commenced), including:
 - Arrowfield Underground Mine; and
 - Bowfield Underground Mine.

6. Identification of Heritage Items

This section of the HHMP identifies all heritage items within, and in the vicinity of, the Project Area that are listed, or that have been assessed, to have heritage significance on some level (potential heritage items).

They are separated, for ease of reference, into items located within the Project Area, and items located outside, but in the vicinity of, the Project Area.

6.1 Within the Project Area

There are no listed heritage items located within the Project Area.

Potential heritage items located within the Project Area are:

- dog-leg fence;
- former house site; and
- shearing shed and creamery.

6.2 In the Vicinity of the Project Area

Potential heritage items located outside, but in the vicinity of, the Project Area are:

- Montrose property;
- former Warkworth Public School;
- Springwood Homestead; and
- piggery and butcher's hut.

These items are shown in **Figure 6-1**.

Three listed heritage sites are located in the vicinity of the Project Area, being Wambo Homestead, St Phillips Anglican Church and Cemetery and former Queen Victoria Inn (ruins). As these items have not been identified to be at any risk of harm as a result of the Project, they are considered separately, as in **Section 0**, below.

6.3 Other Potential Items or Elements Identified in the 2016 HIS

A number of listed heritage items and potential heritage items identified in the 2016 HIS were assessed in that document to be either:

- at no identified risk of harm as a result of the Project; or
- of no identified heritage significance.

As a result, no impact mitigation measures or management strategies were identified for these items. These items are, therefore, not considered further within this HHMP. The items are listed and described in further detail below, for reference. For reference, these items and/or elements are also shown in **Table 6-1**.

Table 6-1: Other Potential Items or Elements Identified in the 2016 HIS not Considered Further in this HHMP

Item Name	Location in Relation to the Project Area	Assessed Significance	Potential Impacts
Non-listed (potential) heritage items			
Warkworth Airfield	South-west corner of the current Warkworth Airfield area (not including the runway) is within the Project Area and additional disturbance area	Assessed by Weir and Phillip, 2007, to have historical significance as a result of its association with its parent aerodrome, the former RAAF base at Bulga. Assessed by ERM 2008 to be “a potentially significant heritage item”. Warkworth Airfield has historical significance derived from an understanding of its ability, as one of the three satellite airfields of RAAF Base Bulga, to demonstrate Australian defence works following the threat of Japanese invasion. This significance lies predominantly with the existing documented records as, with the exception of the airstrip itself, there are no known World War II period structures remaining. It is unlikely to yield substantial new or further archaeological or scientific information and, as such, it has little archaeological or research potential.	The Project will not directly or indirectly impact the landing ground or any aspect of its heritage significance. All RAAF associated improvements and buildings are recorded as having been located on the north side of the airstrip, but none of these former RAAF buildings are known to still be present on the north side of the airstrip. All current buildings are likely associated with the Hunter Valley Gliding Club use of the site.
“Whynot” Homestead	Within the Project Area but not within the additional disturbance area	In 1991, Envirosiences assessed Whynot Homestead as a site of potential heritage significance (Envirosiences, 1991:59).	Although within the current Project Area, and approximately 800 m from the approved Wambo Open Cut, the property is

Item Name	Location in Relation to the Project Area	Assessed Significance	Potential Impacts
	Approximately 800 m from the approved Wambo Open Cut and approximately 3.5 km from the proposed surface extension of the Wambo Open Cut Over 2.5 km from the proposed United Open Cut area	The homestead was further assessed by EJE in 2003, who noted that the buildings were of an overall sound condition and considered the site to have: “...limited significance based upon the manner in which it reflects the break-up and redevelopment of the original Wambo Estate after 1900.” (EJE 2003: CC-8). The EJE report considered no specific mitigation measures were required for Whynot as part of the approved Wambo Development Project.	over 2.5 km from the nearest new open cut mining proposed as part of the Project at its closest point and, as such, is not considered to have any potential additional direct or indirect impacts as part of the Project. Advice from Enviro Strata regarding the distance from the approved and proposed open cut areas, where the predicted range of ground vibration resulting from blasting associated with the Project would be less than 3 mm/s, is less than 2 km.
Abandoned Homestead A	Approximately 1.8 km outside the Project Area boundary Over 4.5 km from the proposed United Open Cut	The site was assessed by EJE Town Planning as having minor local significance, based on the potential to reveal archaeological information regarding federation period farm sites (EJE 2003: CC-6).	As the site is located approximately 1.8 km outside, to the south of, the Project Area and over 4.5 km from the proposed United Open Cut, the Project is not considered to have any potential direct or indirect impact to the site.
Moses Crossing Bridge over the Hunter River	Approximately 1.9 km outside the Project Area boundary Over 2.2 km from proposed extension to the north-west corner of the approved Wambo Open Cut	Moses Crossing Bridge over the Hunter River was identified by ERM, in 2008, as a potentially significant non-listed heritage item. The timber bridge has since been completely removed and replaced with a low concrete bridge; with no evidence remaining of the earlier bridge. Therefore, the site is no longer considered a potential heritage site.	The Bridge is located approximately 1.9 km outside, to the north-west, the Project Area boundary and over 2.1 km from proposed extension to the north-west corner of the approved Wambo Open Cut. The Project is not considered to have any potential direct or indirect impact to the site.
Derelict Windmill	Within proposed United Open Cut area	This site was assessed in the 2016 HIS as having no significance and no research potential.	The derelict windmill site is located within the proposed United Open Cut disturbance area and will

Item Name	Location in Relation to the Project Area	Assessed Significance	Potential Impacts
		It is, therefore, not considered further in this HHMP.	be removed as part of the Project.
Well and Windmill Site	Within additional disturbance area	This site was assessed in the 2016 HIS as having no significance and no research potential. It is, therefore, not considered further in this HHMP.	The well and windmill site is located within the proposed United Open Cut disturbance area and will be removed as part of the Project.
Listed heritage items			
Wambo Homestead	Wambo Homestead listed boundary forms part of Project Area boundary Approximately 2.5 km from the open cut mining proposed as part of the Project at its closest point	Listed on the state heritage register (SHR), Singleton Local Environmental Plan (LEP) 2013, and the Register of the National Estate (non-statutory). Identified to be of state significance.	Enviro Strata (2016) predicted potential vibration impacts to this item as a result of the project to be between 0.1 and 2.4 mm/s. This is below the level at which no impacts are predicted (i.e. less than 3-5 mm/s).
St Phillips Anglican Church and Cemetery	Approximately 1.2 km outside the Project Area boundary Approximately 1.8 km from the open cut mining proposed as part of the Project at its closest point	Listed on the Singleton LEP 2013. Identified to be of local significance.	Enviro Strata (2016) predicted potential vibration impacts to this item as a result of the project to be between 0.1 and 1.5 mm/s. This is below the level at which no impacts are predicted (i.e. less than 3-5 mm/s).
Former Queen Victoria Inn (Ruins)	Approximately 1.8 km outside the Project Area boundary Approximately 2.5 km from the open cut mining proposed as part of the Project at its closest point	Listed on the Singleton LEP 2013. Identified to be of local significance.	Enviro Strata (2016) predicted potential vibration impacts to this item as a result of the project to be between 0.1 and 1.5 mm/s. This is below the level at which no impacts are predicted (i.e. less than 3-5 mm/s).
Old Anglican Cemetery	Approximately 3.9 km outside the Project Area boundary	Listed on the Singleton LEP 2013. Identified to be of local significance.	No impacts predicted.

Item Name	Location in Relation to the Project Area	Assessed Significance	Potential Impacts
	Approximately 4.2 km from the open cut mining proposed as part of the Project at its closest point		

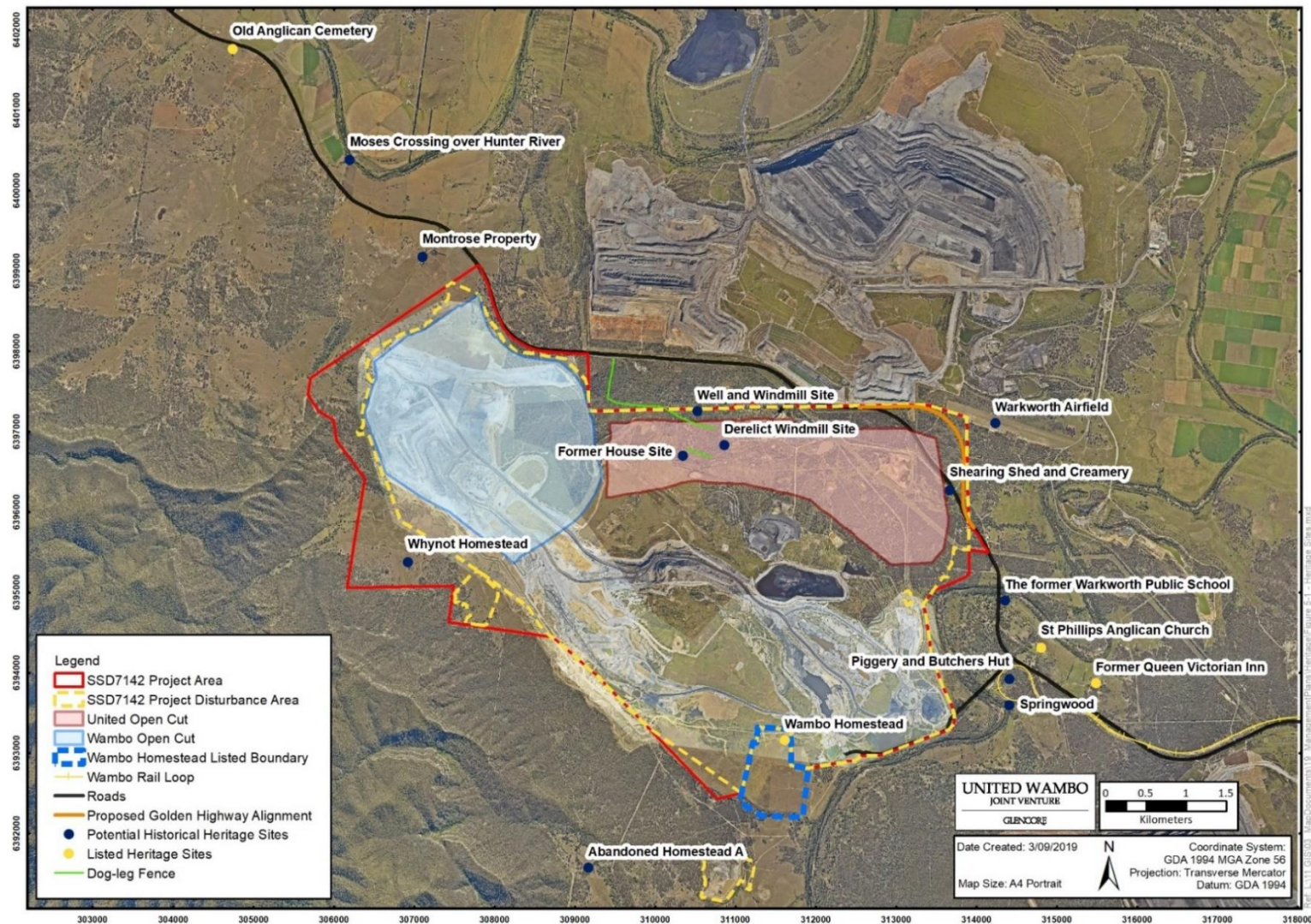


Figure 6-1: Listed and Potential Heritage Items Within, and in the Vicinity of, the Project Area

7. Statements of Significance

This section of the HHMP provides brief descriptions and statements of significance for potential heritage items that will, or have the potential to, be impacted by the Project.

7.1 Within the Project Area

7.1.1 The Dog-Leg Fence

Description

Two sections of dog-leg fence are located within the Project Area. A dog-leg fence is any form of fence with pairs of dog-legs forming crutches supporting a higher log or rail (Pickard 2105:4).

The main section of fence comprises approximately 1.7 kilometres of dog-leg fence located both within and outside (on land owned by Hunter Valley Operations) the Project Area (refer **Figure 6-1**). The second, smaller section of fence, is located wholly within the proposed United Open Cut. Photographs of the fence are provided in **Plate 7-1** and **Plate 7-2** for reference.



Plate 7-1: Relatively Intact Section of the Dog-Leg Fence Located Within the Project Area

© Umwelt, 2015



Plate 7-2: Section Located Outside the Project Area within Coal & Allied Land

© Umwelt, 2015

Plate

7-2



provides an example of rocks packed under the bottom log to reduce the gap and prevent stock escaping.

The fence was erected before 1920, most likely in the 1870s, along boundaries of Conditional Purchases. The fence comprises two horizontal logs, both ironbark, the lower supported on sandstone blocks. Pairs of dog-legs rest across the lower log and support the higher log in their crutch. The dog legs are split ironbark, and like the logs, were sourced from trees that would have been present in the immediate area of the fence. The sandstone blocks have shallow circular channels chiselled across their tops forming a more secure bed for the lower log. While the overall structure is typical of dog-leg fences, the use of sandstone blocks is considered unique. These blocks are all that remain at the eastern end of the fence alignment; the logs having been burnt in bushfires. There are no truly intact portions of the fence, and considerable lengths simply comprise logs lying on the ground or alignments of the sandstone blocks.

Approximately 335 metres of the fence at the eastern end is located within the proposed United Open Cut area and will be removed as part of the Project. A further 340 metres is located outside the Open Cut area but within the Project Area and proposed Project disturbance boundary. As such, approximately 675 metres of the dog-leg fence is likely to be removed as part of the Project. Note that a further 1,230 metres is located outside the Project Area. Within the section located outside the Project Area, there are many places where the original structure is intact, although partially collapsed.

Statement of Significance

“General evidence of rural fences...may provide information about how the landscape was used and changed during its use as pastoral land. However, in general as individual items they have little research potential beyond the immediate physical presence of their type.” (Pickard 2015)

Although the condition of the dog-leg fence has been assessed as being poor, it is a unique example of the former private and government dog-leg fences once common across NSW, and could be seen as an important icon in Australian history (Pickard 2007). Its physical presence within the Project Area provides an opportunity to study and better understand this form of early fence.

As such, the dog-leg fence is considered to be of State significance as it is a unique example of a rare and endangered type of fence; the significance of the fence will be subject to further, more detailed assessment as part of an archival recording of the item undertaken in accordance with the management strategy outlined in this HHMP (refer to **Section 8.5.1**). Only one other example of a dog-leg fence, at Mt Trooper south of Ingebyra, NSW, is known to have been recorded (Pickard 2009:45). The dog-leg fence at Mt Trooper does not have the unique stone supporting blocks of the fence located partially within the Project Area.

7.1.2 Former House Site

Description

The former house site is located to the north of Redbank Creek within Lot 55 DP 753792 and comprises evidence of three former structures in the form of brick and sandstone rubble and concrete slabs (refer to **Plate 7-3** and **Plate 7-4**).



Plate 7-3: Detail of Concentration of Brick Rubble at Former House Site

© Umwelt, 2015



Plate 7-4: Detail of Cistern at Former House Site

© Umwelt, 2015

The three former structures likely comprised:

- two small brick-built structures (one with brick chimney on sandstone footing); and
- one concrete slab with timber frame walls (now gone) and corrugated iron cladding roof.

There are several different sized bricks within the areas of brick rubble; each size seemingly relating to a different former structure. A number of the bricks appear to be made from local clay and were likely fired on site, however, there was no evidence of any clay pits or brick clamps found. A timber block is located within the concrete slab area and may have been a support for an anvil or the base of a butcher's block.

A number of horseshoes were evident in the immediate area of the timber block. There is also an approximately two metre diameter, 1.80 metre deep, circular brick built roughly mortared cistern, scatters of thin sandstone pavers and some evidence of ceramic and glass artefactual material, including a clear glass coffee and chicory essence bottle. The manufacturer of the bottle was Thomas Symington of Edinburgh, one of the leading makers of coffee products during 1920s – 1940s (nzmuseums n.d).

It is reported that there was also a large timber fenced enclosure/corral and 'butchery' located in the immediate area that were destroyed in a substantial bush fire twenty years ago (Ben Kemp Geologist United Collieries, pers comm. 2015).

The former house site would have been constructed by Isaac Frith between 1868 and 1871. Frith appears to have lived there and worked the property until he sold it to a William Hickson in 1920.

Statement of Significance

Former house has been assessed as being of local significance based on the potential to reveal archaeological information regarding what may be a small farmstead enterprise from the mid nineteenth to early twentieth centuries.

The visible physical evidence of a concentration of several different structures, potentially with differing functions, suggests there could be intact archaeological evidence of a working pastoral farmstead, with the ability to provide information about the historical development, occupation and use of the site.

7.1.3 Shearing Shed and Creamery

Description

This site comprises two timber sheds; the 'shearing shed' and a former 'creamery building'. Previous assessment of this site has focused on the creamery, which is reported to have been relocated to the site from the Cheshunt homestead and dairy site to the north of the Project Area on Coal & Allied owned land. The former creamery building was identified by ERM in 2008 as a potentially significant heritage item.

The site is located between Redbank Creek (to the south) and the Golden Highway (to the north). Its location immediately adjacent to the Golden Highway, and the provision of picnic tables makes it a location known and utilised by passing vehicles as a rest stop.

The shearing shed and creamery buildings are located on the 80 acre (32.4 ha) Lot 134 DP 753792 (Portion 134, Parish of Lemington, formerly Portion 4). The site is likely to have comprised a federation period small farm site constructed and operated by Robert Moss, who owned the land between 1919 and 1969, before passing into his wife's hands until 1981 when it was purchased by the CFMEU, Mining and Energy Division.

Creamery

In 2005, Weir & Phillips assessed the Cheshunt homestead and dairy site located to the north of the Project Area on Coal & Allied owned land, including the then in situ creamery building, as being typical of farm homestead groups in NSW dating to approximately the 1880s. Any limited significance was assessed as being on a local level. The creamery building is likely to have originally contained a hand operated separator designed to provide cream to make butter and cream for domestic use and supply skim milk to feed calves (Weir & Phillips 2005:6) (refer to *Plate 7-5*). At the time of the 2005 assessment, the creamery building was identified as a small slab shed with no evidence of the separator surviving.

Since the 2005 assessment, the creamery has been relocated to its present site on the Golden Highway. The relocation of the creamery away from its context within the Cheshunt farm homestead group and the resulting alteration of its construction and fabric, has removed any potential local heritage significance. Slab huts are easily transportable and relocated, making it a fairly common practice. In the absence of any documentation with regards to the reasoning behind its relocation, it seems likely that it was thought it would suit the setting of the extant timber shearing shed adjacent to the Golden Highway, and moved accordingly.

The corrugated iron cladding used in the creamery's construction is trademarked 'Lysaght Australia Orb'. The original Lysaght brand of corrugated iron (under the trademark 'ORB') was exported in large quantities to Australia from 1897. John Lysaght had first established his company in Bristol and commenced manufacture (and export) of corrugated iron in 1857 (Warr 2000:3). John Lysaght (Australia) Ltd was established in 1921 to manufacture uncoated and coated steel sheet (National Library of Australia n.d). The Lysaght Australia Orb stamp on the corrugated iron cladding dates the creamery to post 1921, assuming the corrugated iron comprises the creamery's cladding moved from Cheshunt.



*Plate 7-5: View to West of Creamery and Timber Tank Stand
Note, new concrete slab floor of creamery
© Umwelt, 2015*

Shearing Shed

Aerial photography obtained from the Department of Lands, dating from 1963, shows a much larger farm complex than survives today. The 1963 image shows a number of cleared paddocks associated with what is likely the main house adjacent to the road, a number of outbuildings and the dam, which survives today. Only the shearing shed, dam, an in-ground cistern and a water tank stand survive today (refer to *Plate 7-6*).

The shearing shed has been heavily modified since it was first constructed with numerous alterations and additions, including changes to its use. It may have originally comprised a smaller timber slab hut (or house) that was expanded into a shearing shed. It is possible that it comprised the original residence at the site before the main house (now demolished) was constructed. Apart from the vertical timber slab frontage, which has had a verandah added, the shearing shed comprises a timber framed corrugated iron clad shed. There is a derelict concrete sheep dip to its rear and a brick built in-ground cistern immediately in front of the shed.

As discussed, the main house has been demolished and there is no evidence of it remaining. The former house site is now a levelled area with picnic benches for passing motorists. Planting, likely dated to the use of the property, survive. United personnel have advised that they understand that, previously, there were yards associated with the shed that were extant in the 1980's, however, no evidence of the yards survive today.

Based on the above and further information in the 2016 HIS, the NSW Heritage Branch has required that this site be subject to archaeological investigation in order to assess archaeological potential. A Research Design and Excavation Methodology has been prepared for the site and is appended to this HHMP as **Appendix B - Research Design and Methodology**.

Statement of Significance

This site may have some local significance with the community and the community's sense of place, as a frequently seen landmark and ruin standing in the rural landscape that has been present at the junction of Comleroi Road and The Golden Highway for possibly close to 100 years. The site has also been identified as having archaeological potential, which requires further investigation in order to assess the significance of any archaeological remains present (refer to **Appendix B - Research Design and Methodology**).



*Plate 7-6: View to West of Shearing Shed
Note, in-ground cistern in front of shed
© Umwelt, 2015*

7.2 In the Vicinity of the Project Area

7.2.1 Montrose Property

Description

The Property includes a concrete masonry and fibrous cement sheet constructed house on reinforced concrete piers and slabs. It has a number of additions and modifications (refer to **Plate 7-7**). The house is located within overgrown gardens with a tennis court and in-filled swimming pool. There are also a number of outbuildings, including a shearing shed approximately 400 metres to the north-west of the main house, adjacent to the Golden Highway. A number of other weatherboard buildings and timber/corrugated iron sheds are also within the wider property boundaries.

The shearing shed is located immediately adjacent to the Golden Highway at the entrance to the Montrose property (refer to **Plate 7-8**). It comprises a timber framed corrugated iron clad structure

with a number of smaller attached shed and pen areas. A derelict concrete constructed sheep dip is located immediately adjacent to the shearing shed. There is no evidence of yards remaining in the vicinity of the shed.

The corrugated iron cladding used has the brand 'Redcliffe Trademark'. This brand of imported British corrugated iron was a cheaper version of the original Lysaght brand of corrugated iron (ORB) exported in large quantities to Australia from 1897. John Lysaght was established in Bristol and commenced manufacture of corrugated iron on 1857 (Warr 2000:3).

Although potentially located within the boundary of an early grant (to Smith), on Robert Dixon's 1837 Map of the Colony (refer to Figure 3.2 of the 2016 HIS), the Montrose property is reported to have been constructed during the Federation period from approximately 1910 and is not thought to be related to the early land grant (EJE 2003:CC-15). The current house is not thought to date to the early period of the property and may comprise a more recent reconstruction of an earlier house no longer evident at the site. The current house is starting to show considerable fatigue in its building fabric.



Plate 7-7: View to West of Montrose Property House
© Umwelt, 2015



Plate 7-8: View to North of Montrose Property Shearing Shed
© Umwelt, 2015

Statement of Significance

In 1991, Envirosciences assessed the Montrose property house as a site of potential heritage significance (Envirosciences, 1991: 59). The homestead and associated outbuildings were noted as being in good condition by EJE in 2003, and assessed:

“...to be slightly significant in terms of its heritage and the ability to yield information that might contribute to the cultural history of the wool industry in the early part of the twentieth century (EJE 2003:CC-15).”

The Montrose property is, therefore, assessed to have limited historical significance on a local level, being representative of the historical development of the local area.

7.2.2 Former Warkworth Public School

Description

The former Warkworth Public School opened in 1859 and closed in 1997. The school was called Cockfighters Creek when first opened in May 1859, however, by June was known as Warkworth Public School (NSW Department of Education and Communities). It is Victorian Gothic in style and currently a mine-owned occupied residence.

Statement of Significance

This site was identified by ERM in 2008 as a potentially significant heritage item. It is not subject to any form of statutory heritage listing.

The former school is assessed to have limited historical significance on a local level, being representative of the historical development of the local area as well as the historical provision of education within the local area. The former school is shown in *Plate 7-9*.



Plate 7-9: View to West of the Former Warkworth Public School
© Umwelt, 2015

7.2.3 Springwood Homestead

Description

The Springwood Estate comprises approximately 102 hectares of land and the Springwood Homestead. The Homestead is likely to have been constructed c1860 and displays a number of characterises of late Old Colonial Georgian to Victorian Georgian architecture. The Homestead consists of a timber slab cottage with a wrap-around verandah, a dressed sandstone chimney and later exterior weatherboard cladding. The building had a shingle broken-back roof with dormer windows. The Homestead is shown in *Plate 7-10*.

Within the Estate, and surrounding the Homestead, are a variety of other features, including an orchard, sheds and shed remains, pipes, gates, a pumping house, timber fence posts, dams, and pepper trees.

Statement of Significance

The Springwood Estate CMP states that the Homestead has rarity value in a local context through its construction in slab and weatherboard, rather than masonry. The CMP also states that the cultural heritage significance of Springwood Homestead is related to its historic, associational and aesthetic heritage values as well as its local rarity. The CMP does not identify the Homestead to be significant on a State level and did not recommend local heritage listing.



Plate 7-10: View to South-West Showing Front Elevation of Cottage

© Umwelt, 2015

7.2.4 Piggery and Butcher's Hut

Description

The piggery comprises a small timber and corrugated iron shed open on one side with three interior partitions. The shed is within a small wire fence with metal post enclosure. The butcher's hut is timber frame with timber cladding and a concrete slab floor. The site was identified by EJE Town Planning as being in a dilapidated condition in 2003. Due to the close proximity to each other, this site may have been related to Springwood.

Statement of Significance

EJE Town Planning assessed the site as dating to approximately 1900, of 'minor local significance' in terms of demonstrating a "facet of life of the inhabitants of Warkworth" in the early twentieth century (EJE 2003:C-16).

8. Historic Heritage Management Strategy

This section of the HHMP details the management strategies that have been developed for the historical (non-Aboriginal) heritage and archaeology associated with the Project. It addresses the outcomes of construction undertaken with DPIE and the NSW Heritage Branch, as well as commitments made in the EIS and HIS for the Project.

8.1 Consultation

The 2016 EIS (including the 2016 HIS) has previously been discussed and reviewed by the then NSW Heritage Branch. Initial comments were provided by the Division in September 2016. To address these comments, Umwelt provided a Response to Submissions (RtS) in March 2017.

The NSW Heritage Branch provided further comments and a request for further information in response to the March 2017 RtS in June 2017. Umwelt again responded via a Response to Request for Further Information, dated September 2017. In response to this, a final round of review and comments was provided by the NSW Heritage Branch in October 2017.

This HHMP has been prepared with reference to all of the above referenced consultation, and with particular regard for review and comment provided by the NSW Heritage Branch. The management strategies presented in this document are, in large part, based on the recommended conditions of consent outlined by the Division in their final correspondence, dated October 2017.

This HHMP was submitted to the Heritage Branch on 24 May 2019 and Singleton Council on 25 June 2019 with a request to provide comment. Correspondence was received from the Heritage Branch on 12 July 2019 and Singleton Council on 2 September requesting edits to the HHMP. These edits have been addressed prior to finalisation of this HHMP. Letters from Heritage Branch and Singleton Council regarding their satisfaction with the changes were received 11 October 2019 and 21 November 2019, respectively.

Consultation has been undertaken with neighbouring private landholders and mining companies, Wambo Coal and Coal & Allied (now Hunter Valley Operations - Yancoal/Glencore, and Mount Thorley Warkworth - Yancoal) since the beginning of the Environmental Impact Statement assessment process.

There are no private landholders whose land or buildings have been assessed as being impacted from a historic heritage perspective.

Evidence on consultation on the HHMP is provided in *Appendix A - Evidence of Consultation*.

8.2 Approval of Changes to the HHMP

Any modifications of this HHMP must be submitted to the Secretary of DPE for approval prior to implementing the changes.

8.3 Compliance with Relevant Conservation Management Plans (CMPs)

As discussed in *Section 4.2*, the Project is fully compliant with the relevant policies of existing CMP's for items of heritage significance located in the vicinity.

- Wambo will continue to be responsible for the implementation of the CMP and overall management of the Wambo Homestead. Under the Joint Venture agreement between Wambo and United, United Wambo will be responsible for managing all aspects of the open cut mining operations. This will include implementing all relevant controls relating to Wambo Homestead that relate to open cut mining activities (refer to *Section 4.2.1*). United Wambo will also implement blast controls and monitoring consistent with the existing management regime in place, including achievement of the relevant blasting criteria.
- Springwood Homestead is located approximately two kilometres from the United Open Cut and, therefore, outside of the radius identified in the CMP as requiring management. It is also noted that, despite the distance between the Open Cut and Springwood, the homestead was included within the 2016 HIS, with potential impacts to the site assessed. This 2016 HIS determined that the maximum predicted vibration to Springwood as a result of the Project (2.2mm/s) will be below the conservative vibration limit nominated for heritage items (5mm/s). The Project is, therefore, fully compliant with Policy 9 of the CMP.

8.4 Assessment of Vibration Impacts

As part of the *Blasting Impact Assessment* prepared for the Project by Enviro Strata (Enviro Strata 2016), predicted vibration levels were identified for the non-listed potential heritage items located outside, but in the vicinity of, the Project Area. This was assessed as vibration from blasting that has the theoretical potential to damage/destroy/disturb historical heritage items.

The Blasting Impact Assessment (Enviro Strata 2016) undertook modelling to assess the potential impact of vibration caused by blasting using a blast emission criteria of 5mm/s. As noted in the *Blasting Impact Assessment* (Enviro Strata 2016:30):

“Considering the variety of structures, the applicable assessment criteria are 5 mm/s and 133 dBL.

“The specified assessment criteria are well below the blast damage levels specified by the ANZECC (1990) guidelines “Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration”, adopted by the Office of Environment and Heritage (OEH) (i.e. the lowest transient vibration value for cosmetic damage is estimated as 15 mm/s at 4 Hz).

“The assessment criteria are in line with the ACARP Report (No. C14057) findings for Heritage Sites, which recommends ‘safe’ vibration limits such as those used by British Standard BS7385. Note that these assessment criteria are not limits that must be met but indicate the levels at which no impacts are predicted.”

The applicable ground vibration criteria used in the 2016 HIS and continued in this HHMP is, therefore, 5mm/s. Ground vibration less than 5mm/s is not anticipated to result in any adverse impacts to listed or potential heritage items.

Table 8-1 details the potential heritage items located outside, but in proximity to, the Project Area that should be considered in terms of potential vibration impacts (refer to **Figure 6-1**). Maximum predicted vibration levels are indicated as detailed in the blast assessment (Enviro Strata 2016). The predicted vibration levels are noted in relation to the closest open cut area with the highest predicted range of vibration.

Table 8-1: Identified Potential Heritage Items Located in the Vicinity of the Proposed Open Cut Area and Predicted Ground Vibration Due to Blasting

Item Name	Location	Coordinates (MGA)	Listing and Significance	Predicted Range of Ground Vibration (mm/s)
Montrose Property	Golden Highway	307106.11, 6399174.85	No statutory listing Local significance	Wambo Open Cut 1.7 to 14 United Open Cut 0.1 to 1.1
The former Warkworth Public School	Warkworth	314356.24, 6394899.78	No statutory listing Local significance	Wambo Open Cut 0.1 to 0.7 United Open Cut 0.5 to 6.7
Springwood Homestead (formerly Abandoned Homestead B)	Warkworth	314410.89, 6393600.87	No statutory listing Local Significance	Wambo Open Cut to 0.5 United Open Cut 0.2 to 2.2
Piggery and Butcher's Hut	Warkworth	314410.89, 6393922.23	No statutory listing. Local Significance	Wambo Open Cut to 0.6 United Open Cut 0.2 to 2.8

As **Table 8-1** demonstrates, the following items will not be subject to any identified impacts as a result of vibration caused by blasting:

- Springwood Homestead (formerly Abandoned Homestead B); and
- piggery and butcher's hut.

As such, no further management measures are required for these items, and they are not considered within the remainder of this HHMP.

Refer to **Section 8.6** for management of the Montrose property and the former Warkworth Public School.

8.4.1 The Dog-Leg Fence

With regard to the dog-leg fence, the *Blasting Impact Assessment* (Enviro Strata 2016:30) states the following:

“It is inferred that with time there has been a gradual and substantial deterioration of the whole structure due to timber-intensive construction and exposure to the elements of nature.

“The remaining components of the fence are positioned low, above ground level and most likely wedged against each other enabling the structure to sustain significant vibration impact.

“There is no vibration criteria set for the dog-leg fence. Due to the nature of the structure, the impact of blasting on the fence cannot be accurately predicted.”

As such, the dog-leg fence is not included in *Table 8-1*.

8.5 Management of Direct Impacts

Direct impacts are considered to be physical impacts to a site, including removal/destruction.

8.5.1 The Dog-Leg Fence

Two sections of dog-leg fence are located within the Project Area. Approximately 335 metres of the fence is located within the proposed United Open Cut and will be removed as part of the Project. A further 340 metres is located outside the open cut area but within the proposed Project disturbance boundary and is also likely to be removed as part of the Project. As such approximately 675 metres of the dog-leg fence is likely to be removed as part of the Project. Note that a further 1,230 metres is located outside the Project Area.

Due to the nature of the item, protecting the dog-leg fence against fire would be impossible and hazard reduction is not a preferred option on land associated with open-cut coal mines. Mechanical fire breaks would not be wide enough to be effective in the type of vegetation surrounding the fence line. As such, detailed recording of the full length of both sections of the dog-leg fence is the only practicable option.

The dog-leg fence has been assessed as being of State significance.

8.5.1.1 Management Strategies

Detailed Archival Recording

- A detailed survey and photographic/archival recording was undertaken in accordance with Heritage Branch guidelines *Photographic Recording of Heritage Items Using Film or Digital Capture* (2006) on the 27 August 2021.
- Recording the full surviving alignment of the dog-leg, including the section located outside the Project Area, ensures all surviving physical aspects of the fence are identified and documented prior to any disturbance as a result of the Project or everyday natural threats such as bush fires, termite attack and decay. The proposed detailed archival recording will ensure that a full understanding and record of the dog-leg fence will be available for future generations.
- As part of the archival recording additional research was undertaken to identify (if the information is available) an exact date of construction and who may have built the fence, as well as to confirm the preliminary assessment of the fence as State significant. Inspection reports associated with each Conditional Purchase may provide useful information in this regard (Pickard 2015) and will be reviewed as part of this additional research.

- The archival record will be submitted to DPE, the Heritage Council, and the relevant local Council libraries.

Interpretation Strategy

- In addition to the detailed recording, an interpretation strategy has been developed for the dog-leg fence. In accordance with comments received from the NSW Heritage Branch, United Wambo committed to developing and implementing an interpretation strategy for the fence **within two years of commencement of operations under SSD 7142**. The interpretation Strategy has been developed, however, implementation was not achieved within 2 years of commencement due to the proposed location in the Jerrys Plains Recreation Area forming part of upgrades associated with funding from the Project Voluntary Planning Agreement. DPE was notified on the 23 December 2021, and requested “undertake all endeavours to complete the requirements of condition B82(d) of SSD-7142 as soon as practicable”.
- The interpretation strategy was developed in consultation with the NSW Heritage Council and in accordance with relevant Heritage Council guidelines including:
 - *Interpreting Heritage Places and Items Guidelines* (2005); and
 - *Heritage Interpretation Policy* (2005).
- The interpretation strategy to date has been, and will continue to involve and be informed by consultation with the community, local historical society and Singleton Council.
- As part of this interpretation strategy, a plan to salvage, reconstruct and publicly display a section of the dog-leg fence will be developed. Consideration will be given to the feasibility of salvaging the stone blocks of the fence and combining these with logs cut from within the Project Area, when it is cleared as part of site preparation works for the open cut.
- The strategy will assess the potential location of the reconstructed fencing, including at the entrance to the mine site or within a community space/park in Jerrys Plains or Warkworth.
- Consideration will also be given to enhancing the interpretive potential of the dog-leg fence through the use of signage, as this would provide an opportunity to highlight the heritage significance in a way that the general community can identify with.

8.5.2 Former House Site

The former house site is located within the proposed United Open Cut and will be removed as part of the Project.

The former house site has the potential for a locally significant archaeological resource.

8.5.2.1 Management Strategies

Archaeological Investigation

- Prior to the commencement of works that impact on this site, including ground preparation/clearing works, archaeological investigation of the former house site will be undertaken to normal professional standards. The investigations should comprise (subject to consultation with the NSW Heritage Branch) a program of archaeologically monitored machine stripping of the grass cover focusing around the known former building locations.
- Prior to archaeological works commencing, a full, detailed Research Design, including an Archaeological Excavation Methodology, will be prepared in accordance with the Heritage Council guidelines for the approval of the Secretary, DPE, upon receipt of advice from the NSW Heritage Branch.

- An archaeological consultant will be nominated for the works. The consultant(s) will have appropriate qualifications and experience commensurate with the scope of the Major Project works and will meet the requirements of the Excavation Director Criteria published by the Heritage Council of NSW. The name and experience of the consultant(s) will be submitted to the Secretary of the DPE for approval prior to the commencement of works.
- Following the completion of archaeological works, a copy of the final excavation report(s) will be lodged with the Heritage Council of NSW, the local Council, and the DPE.
- A repository will be nominated for any relics salvaged from the historical archaeological excavations.

The Research Design, including an Archaeological Excavation Methodology, prepared for the former house site, is included as **Appendix B - Research Design and Methodology** of this HHMP.

8.5.3 Shearing Shed and Creamery

The shearing shed and creamery is located within the proposed United Open Cut disturbance area immediately adjacent to the proposed United Open Cut and will be removed as part of the Project.

The former creamery building was identified by ERM in 2008 as a potentially significant heritage item. The 2016 HIS found that the shearing shed and creamery may have some local significance with the community and the community's sense of place as a frequently seen landmark and ruin standing in the rural landscape that has been present at the junction of Comleroi Road and the Golden Highway for possibly close to 100 years.

8.5.3.1 Management Strategies

Detailed Archival Recording

- A detailed photographic archival recording was undertaken in accordance with Heritage Branch guidelines *Photographic Recording of Heritage Items Using Film or Digital Capture* (2006) on the 27 March 2020 (Umwelt 2020a).
- This photographic recording included views to and from the site, as well as drawings and plans of the site, in accordance with the above referenced guidelines.
- The archival record was submitted to DPIE, the Heritage Council, and the relevant local Council libraries on 24 July 2020.

Archaeological Investigation

- Prior to the commencement of works that impact on this site, including ground preparation/clearing works, archaeological investigation of the shearing shed and creamery will be undertaken to normal professional standards.
- Prior to archaeological works commencing, a Research Design including an Archaeological Excavation Methodology will be prepared in accordance with the Heritage Council guidelines for the approval of the Secretary, DPE, upon receipt of advice from the NSW Heritage Branch.
- An archaeological consultant will be nominated for the works. The consultant(s) will have appropriate qualifications and experience commensurate with the scope of the Major Project works and will meet the requirements of the Excavation Director Criteria published by the Heritage Council of NSW. The name and experience of the consultant(s) will be submitted to the Secretary of the DPE for approval prior to the commencement of works.
- Following the completions of archaeological works, a copy of the final excavation report(s) will be lodged with the Heritage Council of NSW, the local Council, and the DPE.

- A repository will be nominated for any relics salvaged from the historical archaeological excavations.

The Research Design, including an Archaeological Excavation Methodology, prepared for the shearing shed and creamery is included as **Appendix B - Research Design and Methodology** of this HHMP.

8.6 Management of Indirect Impacts

Indirect impacts are considered to include vibration from blasting, which has the theoretical potential to damage/destroy/disturb historical heritage items.

8.6.1 Montrose Property

The Montrose property is located to the northwest of the Project Area approximately 750 metres from proposed extension to the north-west corner of the approved Wambo Open Cut.

The maximum predicted level of ground vibration for the site is 14 mm/s. It is noted that this figure is a worst-case scenario prediction for the largest predicted blast at the closest point to the Montrose property. However, the Montrose property, and in particular, the shearing shed, may be susceptible to damage from ground vibration.

As discussed at **Section 7.2.1**, the main house on the Montrose property has been previously assessed by EJE to have been constructed during the Federation period, from approximately 1910, and is not thought to be related to any early land grant (EJE 2003:CC-15). The current house is not thought to date to the early period of the property and may comprise a more recent reconstruction of an earlier house no longer evident at the site. The main house on the Montrose property was recorded as part of the 2016 HIS; the photographic catalogue (photographic record sheets) and photographs (as thumbnail image sheets/proof sheets and burned to CD) are included as Appendix C of the 2016 HIS. Based on its age and the photographic recording already undertaken, the main house is considered to have been sufficiently recorded and does not require any further archival recording.

8.6.1.1 Management Strategies

Detailed Archival Recording

- As a result of the property's susceptibility to damage from ground vibration, a photographic/archival recording of the shearing shed on the Montrose property was undertaken in accordance with Heritage Branch guidelines *Photographic Recording of Heritage Items Using Film or Digital Capture* (2006) on the 26 March 2020 (Umwelt, 2020b). This investigation was completed prior to any blasting being undertaken as part of the Project, with blasting commencing on the 6 April 2020.
- As part of the archival recording, further research was undertaken of the Montrose property, to better understand the history of occupation and use of the property.
- The archival record was submitted to DPIE, the Heritage Council, and the relevant local Council libraries on the 24 July 2020.

8.6.2 Former Warkworth Public School

The former Warkworth Public School is located 480 metres outside, to the east of, the Project Area boundary, approximately 930 metres from the proposed United Open Cut.

The maximum predicted ground vibration level for building is 6.7 mm/s. As such, the former Warkworth Public School may be susceptible to damage from ground vibration.

However, although the maximum predicted ground vibration levels for the former Warkworth Public School are up to 6.7 mm/s, the potential vibration impact for the building can be effectively managed via the application of lower charge masses (Enviro Strata 2016:35). As an additional precautionary measure, subject to discussions with the landowner, United Wambo will undertake an inspection of the former Warkworth Public School prior to commencement of the Project. Regular inspections will also be undertaken, in accordance with the United Wambo Joint Venture Blast Management Plan, to confirm that no damage has occurred due to the Project at the former Warkworth Public School.

8.6.2.1 Management Strategies

Blasting Management

Blast sizes will be managed to 5 mm/s for this building via the application of lower charge masses, except where agreed otherwise with the owner and/or based on a structural assessment that identifies an alternate acceptable vibration level. Ongoing blast vibration monitoring will be undertaken as part of the Project to monitor compliance with the relevant criteria.

Condition Assessment

United Wambo committed to complete a baseline condition assessment of the former Warkworth Public School prior to blasting as part of the Project, subject to landowner consent. Due to being denied access to the property over concerns and restrictions regarding COVID-19 the baseline assessment was not able to be undertaken until 25 May 2020 (Umwelt 2020c), after blasting had commenced for the Project on the 6 April 2020.

In the period from 6 April to 25 May, there were 8 blasts in the United Pit. The vibration results for these blasts at the monitor nearest the former Warkworth Public School (BM02) reached a maximum of 0.57 mm/s vibration, making it unlikely that there would have been any impact to the former Warkworth Public School from blasting activities.

8.7 Program/Procedures for Photographic/Archival Recording

All photographic/archival recording will be undertaken prior to the commencement of any activities that would potentially disturb/impact the heritage item nominated for photographic/archival recording.

The archival recordings will be undertaken in accordance with Heritage Council guidelines *Photographic Recording of Heritage Items Using Film or Digital Capture* (2006).

The photographic recordings will include:

- a brief report detailing background information and methodology in addition to the actual archival record (where relevant, this will include additional historical research and detailed significance assessment (i.e. for the dog-leg fence, as discussed at **Section 8.5.1**);
- detailed photographs of site/item (this will include contextual photographs showing site/item and remains, and relevant relationships to other sites/items and surroundings);
- photographic catalogue sheets (photographic record sheets);
- measured plans of the sites/item (unless nature of site/item does not warrant a site plan, in these instances the photographs will be accompanied by an appropriate plan indicating the location of the site only); and
- photographic plans (referenced to the photographic catalogue sheets) particular to each site showing the locations of all the photographic images (unless nature of item does not warrant a photographic plan).

Sites to have photographic/archival recording:

- dog-leg fence;
- shearing shed and creamery; and
- shearing shed on Montrose property.

The archival recordings will be submitted to DPE, the Heritage Council, and the relevant local Council libraries.

8.8 General Management Strategies

8.8.1 Historic Heritage Induction

Historic heritage is a component of the United Wambo Site Induction. The induction is required for all personnel prior to working at United Wambo. It is also a requirement to obtain an approved Ground Disturbance Permit (GDP) from the E&C department prior to any disturbance at United Wambo which includes a review and avoidance of any known heritage sites.

The induction includes details on the following:

- the nature and location of the heritage sites;
- the historical heritage values and significance of the heritage sites;
- the nature of the protection measures being undertaken;
- the content of this HHMP; and
- information related to the relevant legislation for the protection of historical heritage sites/items (particularly provisions Section 139 and 146 of the Heritage Act 1977 (NSW)) and the penalties which may arise if sites/items are disturbed/destroyed.

8.8.2 Protection of Listed and Potential Heritage Items During Works

Potential heritage items located within the Project Area, which will not be impacted by the Project, must be:

- appropriately fenced during the course of any works being undertaken within 100 metres of the potential items to avoid incidental physical impacts.
 - Appropriate fencing would include chainmesh or similar, or orange safety mesh fencing or similar.
 - The installation of fencing should not result in any physical impacts to the potential items or their associated fabric.
 - The installation of complementary, appropriate and informative signage to any fencing erected is recommended. The signage would act to inform workers and users of the area of the purpose of the fencing and identify the relevant personnel to be contacted in the event that incidental impacts to the potential item(s) occur during the course of works.
 - For the purposes of this project, the above fencing requirements apply to the 'Whynot Homestead'. Due to the nature of its use and its spatial extent, fencing of the 'Warkworth Airfield' is not feasible. Information pertaining to the 'Airfield' and the potential heritage significance of this item is to be communicated to relevant staff, contractors and visitors via induction material and mapping.

- recorded on a complete map showing the location of all listed and potential heritage items located within the Project Area is to be prepared prior to works commencing within the Project Area.
 - This mapping is to be provided to all relevant staff and contractors that will or that have the potential to work in the vicinity of these items.

8.8.3 Management of Discovery of New Heritage Sites/Items

If, during the course of works, any previously unknown historical archaeological material or heritage sites/items are uncovered or identified, all work in the area of the item(s) shall cease immediately and a qualified heritage consultant/archaeologist consulted. If the archaeologist considers the material uncovered constitutes an archaeological 'relic' or a heritage item, the Heritage Branch will be consulted, in accordance with Section 146 of the Heritage Act 1977 (NSW), to determine an appropriate course of action prior to the recommencement of work in the area of the item.

A 'relic' under the Heritage Act is defined as any deposit, object or material evidence that:

- relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement; and
- is of State or local heritage significance.

Appropriate management strategies for the discovery of new and/or unexpected Aboriginal archaeological material are provided separately in the ACHMP (Ozark, in prep).

8.8.4 Potential Human Skeletal Remains

In the event that a potential burial site or potential human skeletal remains are exposed in any area subject to surface disturbance or remediation works, the procedure below is to be implemented in accordance with the *Policy Directive – Exhumation of Human Remains* (NSW Department of Health 2008), *Skeletal Remains – Guidelines for the Management of Human Skeletal Remains under the Heritage Act 1977* (NSW Heritage Office 1998) and the *Aboriginal Cultural Heritage Standards and Guidelines Kit* (NPWS 1997):

- as soon as remains are exposed, work is to halt immediately to allow assessment and management;
- contact local police, the Biodiversity & Conservation Division (BCD) of DPE and the Heritage Branch;
- a physical or forensic anthropologist will inspect the remains in situ, and make a determination of ancestry (Aboriginal or non-Aboriginal) and antiquity (pre-contact, historical or forensic);
- if the remains are identified as forensic, the area is deemed as crime scene;
- if the remains are identified as Aboriginal and not forensic, the site is to be secured and the OEH and all registered Aboriginal parties are to be notified in writing; or
- if the remains are non-Aboriginal (historical) remains and not forensic, the site is to be secured and the Heritage Branch is to be contacted.

The above process functions only to appropriately identify the remains and secure the site. From this time, the management of the remains is to be determined through liaison with the appropriate stakeholders (New South Wales Police Force, forensic anthropologist, BCD, Heritage Branch, and registered Aboriginal parties, etc) and in accordance with the Public Health Act 1991.

Approval from NSW Health, under the Public Health Act 1991, will be required prior to removing/exhuming any skeletal remains. If removal/exhumation is required and approved, controlled excavation and removal by the site archaeologists and other appropriate specialists (forensic anthropologist, Aboriginal stakeholders, New South Wales Police Force, as appropriate) will be undertaken in accordance with *Heritage Council Skeletal Remains Guidelines* and any requirements of the BCD and NSW Health.

If removal/exhumation is required, a site-specific management policy for the removal of any potential human skeletal remains uncovered within the proposed Project area will be developed, in consultation with a physical anthropologist, the Heritage Branch and relevant stakeholder groups. The management policy will consider the issues detailed in the *Heritage Council Skeletal Remains Guidelines*. These issues include but are not limited to:

- excavation issues, including personnel who may need to be required, Occupational Health & Safety and recording;
- access issues, including limited access, security and public and professional participation;
- management issues, including management during excavation and analysis, publicity, interpretation, location of interim resting place (in consultation with relevant stakeholders), ongoing curation of recovered materials and professional access to data; and
- re-interment and commemoration.

8.9 Reporting and Review

8.9.1 Internal Reporting

United Wambo's Environment & Community team will review blast monitoring results to assess whether there have been, or are likely to have been, any exceedances of the blast vibration criteria for each of the heritage items discussed in **Section 6**. If recorded exceedances (or likely exceedances) are identified, the relevant heritage item must be inspected, and potential impacts to the heritage item and any remediation works or further assessment that may be required, recorded.

United Wambo's Environment & Community Manager will report to the Operations Manager the results of any investigations of recorded exceedances or likely exceedances. The findings of these investigations, including an outline of required mitigation actions (if any), will be reported to United Wambo's Senior Management.

8.9.2 External Reporting

8.9.2.1 Annual Report

Compliance with the requirements of the development consent (including implementation of this Plan) will be reported in the Annual Review submitted to the Planning Secretary as per the requirements set out in the development consent.

8.9.2.2 Incident Report

Any breach of performance measures or recorded exceedance of vibration criteria at a heritage item identified in **Section 6** will be reported to the Planning Secretary in accordance with the requirements of the development consent.

8.9.3 Review

This HHMP is to be reviewed and updated, if necessary, within three months of:

- the submission of an Annual Review (refer to **Section 8.9.2.1**);
- the submission of an incident report in relation to a heritage item (refer to **Section 8.9.2.2**); and
- the submission of an audit report required under the development consent,

unless otherwise directed by the Planning Secretary. The review process is to reflect changes in environmental legislation and guidelines, and changes in technology or operational procedures.

9. Document Information

Relevant legislation, standards and other reference information must be regularly reviewed and monitored for updates and should be included in the site management system. Related documents and reference information in this section provides the linkage and source to develop and maintain site compliance information.

9.1 Related Documents

Related documents, listed in **Table 9-1** below, are *documents* directly related to or referenced from within this document.

Table 9-1: Related Documents

Number	Title
UWOC-1689771511-366	United Wambo Aboriginal Cultural Heritage Management Plan
WA-ENV-MNP-510	Wambo Coal Heritage Management Plan

9.2 Reference Information

Reference information, listed in **Table 9-2** below, is *information* that is directly referred to for the development of this document.

Table 9-2: Reference Information

Reference	Title
Collins 1994	Collins, B. 1994. Wambo Homestead near Warkworth, NSW: A Conservation Plan.
Dean-Jones and Mitchell 1993	Dean-Jones, P. and Mitchell, P. 1993. New South Wales Department of the Environment and Conservation. Hunter Valley Aboriginal Sites Assessment Project: Environmental Modelling for Archaeological Site Potential in the Central Lowlands of the Hunter Valley. Report to NSW National Parks and Wildlife Service.
EJE 2003	EJE Town Planning (EJE) 2003. Wambo Development Project Non-Aboriginal Heritage Impact Statement.

Reference	Title
Enviro Strata 2016	Enviro Strata Consulting. 2016. United Wambo Open Cut Coal Mine Project Blasting Impact Assessment. For Umwelt (Australia) Pty Ltd on behalf of United Collieries Pty Ltd.
ERM 2008	ERM. January 2008. Hunter Valley Operations South Coal Project. Environmental Assessment Report. Prepared for Coal & Allied Operations Pty Ltd.
Envirosciences, 1991	Envirosciences Pty Limited. 1991. Environmental Impact Statement Extension of United Collieries Underground Mine at Warkworth. Prepared for United Collieries Pty Ltd.
ERM 2015	ERM. 2015. Springwood Homestead Conservation Management Plan. Prepared for Rio Tinto Coal Australia.
GML 2010	Godden Mackay Logan (GML). 2010. Wambo Homestead Complex Heritage Strategy. Report prepared for Wambo Coal Pty Ltd
DUAP 1996	Heritage Office and Department of Urban Affairs and Planning (DUAP), 1996. Regional Histories. Department of Urban Affairs and Planning and Heritage Council of New South Wales.
NSW Department of Education and Communities	NSW Department of Education and Communities. Accessed 7 December 2015. http://www.governmentschools.det.nsw.edu.au/index.shtm .
Pickard 2007	Pickard, John. 2007. Australian Rural Fences: Heritage Challenges for Conserving the Unconservable. International Journal of Heritage Studies, 13:6.
Pickard 2015	Pickard, John. 2015. Dog-leg fences within proposed United Collieries open cut
Rappoport 2006	Rappoport. 2006. Edderton, 1477 Edderton Road, Muswellbrook, Conservation Management Plan. DRAFT.
Umwelt 2016	Umwelt (Australia) Pty Ltd. 2016. United Wambo Open Cut Coal Mine Project Environmental Impact Statement. For United Collieries Pty Limited.
Umwelt 2016	Umwelt (Australia) Pty Ltd. 2016. United Wambo Open Cut Coal Mine Project Heritage Impact Statement. For United Collieries Pty Limited.
Umwelt 2017a	Umwelt (Australia) Pty Ltd. March 2017. United Wambo Open Cut Coal Mine Project: Response to Submissions. For United Collieries Pty Limited.
Umwelt 2017b	Umwelt (Australia) Pty Ltd. September 2017. United Wambo Open Cut Coal Mine Project: Response to Request for Further Information. For United Collieries Pty Limited.

Reference	Title
Umwelt 2020a	Umwelt (Australia) Pty Ltd. April 2020. Photographic Archival Record Shearing Shed and Creamery United Wambo Open Cut Coal Mine Project – SSD 7142
Umwelt 2020b	Umwelt (Australia) Pty Ltd. June 2020. Photographic Archival Record Shearing Shed on the Montrose Property United Wambo Open Cut Coal Mine Project – SSD 7142
Umwelt 2020c	Umwelt (Australia) Pty Ltd. July 2020. Baseline Condition Assessment Former Warkworth Public School.
Warr 2000	Warr, A. 2000. Roofing Corrugated Iron – Options for Repair. Paper given as part of NSW Heritage Office Material Evidence Conserving Historic Building Fabric Seminar 13-14 April 2000.
Weir and Phillips 2005	Weir & Phillips. 2005. Heritage Assessment Cheshunt Singleton. Report prepared for ERM Australia on behalf of Coal & Allied Industries Ltd.
Weir and Phillips 2007	Weir & Phillips. 2007. <i>Heritage Impact Statement Warkworth Aerodrome, Warkworth, New South Wales</i> . Report prepared for Coal & Allied Industries Ltd.

9.3 Change Information

Full details of the document history are recorded in the document control register, by version. A summary of the current change is provided in **Table 9-3** below.

Table 9-3: Change Information

Version	Date	Change Details
1.0	July 2019	New document
1.1	November 2019	Updated to address comments received from Department of Planning Industry and Environment Approved 25/11/2019
2.0	May 2021	Updated to confirm completion of mitigation measures relating to the Montrose property (including the shearing shed), the Shearing Shed and Creamery and inspection of the former Warkworth Public School. Approved 26/10/2021
3.0	April 2022	Reviewed and updated in accordance with Condition E7 – Modification 1. Revised Section 8.5 with updates to Dog-leg Strategy – development and implementation.
4.0	September 2022	Minor formatting and revision of version number

10. Accountabilities

The key accountabilities associated with the HHMP are highlighted below.

Table 10-1: Accountabilities

Title	Roles and Responsibilities
Operations Manager	• Authorise internal and external reporting requirements as well as subsequent revisions of this HHMP; • oversee implementation of the HHMP to ensure compliance with consent requirements; and • provide adequate resources for the implementation of this HHMP.
Environment & Community Manager	• Ensure that sufficient time and resources are allocated to allow for the implementation of the HHMP; • coordinate the day-to-day implementation of the HHMP, including the implementation of all management activities; • analyse and collate documentation for inclusion in the Annual Review; • ensure all internal and external reporting requirements are met; • ensure that all relevant records are effectively maintained on site; • periodically review progress against targets and performance indicators; • ensure that personnel involved in the carrying out and monitoring of the HHMP activities and values are appropriately qualified, licensed and experienced to undertake the task; • ensure non-Aboriginal heritage information is included in inductions undertaken by relevant mine personnel; • contact qualified archaeologist/heritage consultant and Heritage Branch as appropriate, should previously unknown historical archaeological material/heritage sites/items be uncovered or identified; and • contact all appropriate stakeholders in the event human skeletal material is exposed during works.
Other United Staff and Contractors	• Ensure staff and contractors are informed and trained where relevant in relation to historic heritage; • undertake activities in line with directions from the Operations Manager and Environment & Community Manager; • manage heritage related complaints in accordance with Glencore's complaints management procedure; • assist with the review of this plan as required; • comply with the management requirements and commitments contained within this management plan; and • report all non-compliances with this plan in accordance with Glencore reporting procedures.

Appendix A - Evidence of Consultation

A.1 Heritage Branch



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Our ref: DOC19/445244

Ms Aislinn Farnon
Glencore

By email: Aislinn.Farnon@glencore.com.au

Dear Ms Farnon

United Wambo Project Historic Heritage Management Plan - SSD 7142

I refer to your email dated 24 May 2019 seeking Heritage comments on the draft United Wambo Project Historical Heritage Management Plan (HHMP) (undated) prepared by Umwelt (Australia) Pty Limited.

Heritage Council previously recommended draft conditions to address concerns regarding historic heritage and archaeology in a letter dated 4 October 2018 to the Department of Planning and Environment. One of the conditions required preparation of the Historic Heritage Management Plan in consultation with the Heritage, Community Engagement (formerly Heritage Division).

It is noted that the submitted draft HHMP is prepared to satisfy the draft Condition B70 of the recommended conditions of consent for SSD 7142.

The draft HHMP has been reviewed and the Heritage Council provides the following comments:

- The HHMP adequately addresses the concerns regarding the historic heritage within and near the project area. All the heritage items within and in the vicinity have been identified and their condition has been assessed. The document provides description of the measures to be implemented by United Wambo to manage and protect these known heritage items and includes strategies for ongoing blast vibration monitoring and comprehensive archival recording of the heritage items proposed to be removed.
- The Research Design and Methodology included as Appendix A of the HHMP prepared by Umwelt Pty Ltd has been reviewed for this project. The research design needs to identify appropriate questions that archaeological investigation can address based on the historical evidence and significance assessment, including comparative information about the site (in a local/state regional setting). The two sites which are discussed in this research design include an 1868 House Site linked to Isaac Frith and a Shearing Shed and Creamery dating from the late 1910s.
- There is no link in the A.1.4 research questions to the research themes identified in Table 1 and how the proposed questions could contribute meaningful information about its material evidence which no other resource can provide. The need to archaeologically investigate and record this site is noted, however the questions to guide this program are broad and focus on whether any archaeological evidence will be present to record and if evidence is present what it could tell us about the development of the local area.

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- It is noted the program of physical investigation will focus on machine monitoring because the location of former structural elements is unknown. Monitoring is an appropriate strategy to employ in this circumstance, with more detailed physical recording following, where such evidence is found.
- To resolve the issue of the current research questions posed, it is recommended that the research design be amended so that following Phase 1 investigation (monitoring) and before commencing the detailed phase 2 works, the research questions are revised by the Excavation Director to respond more clearly to the historical evidence of this site, its assessed significance values, and the historic themes identified in Table 1.

Those revised questions should be used to guide and focus the detailed investigation and recording of these sites. If works do not proceed to Phase 2, the research questions currently proposed are likely to satisfy the Phase 1 monitoring program as a result of limited physical evidence surviving to warrant further detailed investigation.

- It is noted the requirements for the Archaeologist who will act as the Excavation Director is linked to Condition B70 of the CoA.
- The Care and Control Strategy (identified in Appendix A of the HHMP – Section A.6) needs to clearly identify the Applicant will retain long term management of the artefacts including their conservation as historical archaeological 'relics' at the completion of this SSD project.

If you have any questions regarding the above, contact Vibha Upadhyay, Senior Heritage Assessment Officer, at Heritage, Community Engagement, on 9873 8587 or vibha.upadhyay@environment.nsw.gov.au.

Yours sincerely



12/07/2019

Katrina Stankowski
Senior Team Leader, Regional Heritage Assessments, North
Heritage, Community Engagement
Department of Premier and Cabinet
As Delegate of the Heritage Council of NSW



DOC19/791740

Ms Aislinn Farnon
Approvals Manager
United Wambo JV Project
134 Jerrys Plains Road
WARKWORTH NSW 2330

By email to: Aislinn.Farnon@glencore.com.au

Dear Ms Farnon

**RE: HISTORIC HERITAGE MANAGEMENT PLAN FOR THE UNITED WAMBO PROJECT
(SSD-7142)**

I refer to your email dated 10 September 2019 inviting comment on the final Historic Heritage Management Plan (HHMP) prepared by Umwelt Australia Pty Ltd (undated).

The HHMP was required to be prepared in consultation with Heritage NSW (formerly Heritage Division) to satisfy Condition B70 of the conditions of consent for the SSD 7142. Comments were provided by Heritage NSW on the draft HHMP in a letter dated 12 July 2019. The final HHMP has been assessed and is considered to have addressed the outstanding issues as follows:

- The Research Design and Methodology has been amended so that following completion of Phase 1 (investigation) and prior to commencement of the Phase 2 works (detailed investigation), revision of the research questions by the nominated Excavation Director is to be undertaken with consideration of the historical evidence of the site, the significance of the site and the historic themes identified in Table 1 (B.1.4 HHMP).
- The Care and Control Strategy identifies the applicant as responsible for the storage and long-term management, including conservation, of any historical artefacts or samples collected (B.6 HHMP).

If you have any questions regarding the above, please contact Tempe Beaven, Senior Heritage Assessment Officer at the Heritage NSW, Community Engagement, Department of Premier and Cabinet, on 9873 8629 or Tempe.Beaven@environment.nsw.gov.au.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Katrina Stankowski'.

11/10/2019

Katrina Stankowski
Senior Team Leader, Regional Heritage Assessments – North
Heritage NSW, Community Engagement, Department of Premier and Cabinet
As Delegate of the NSW Heritage Council

Helping the community conserve our heritage

A.2 Singleton Council



Our Ref: M9-4

2 September 2019

Aislinn Farnon
Approvals Manager
United Wambo JV Project
134 Jerrys Plains Road
WARKWORTH NSW 2330

Dear Ms Farnon

RE: Request for comment: Historic Heritage Management Plan

I refer to your email to Singleton Council dated 25 June requesting comment from Council on the Historic Heritage Management Plan. This letter forms Council's comments in relation to that request.

Council has referred to the Historic Heritage Management Plan to our Heritage Advisor, who has provided feedback to council staff, which has been incorporated into this letter.

The Historic Heritage Management Plan (HHMP) prepared by Umwelt addresses the historical (non-Aboriginal) heritage and archaeological management issues associated with the United Wambo JV (United Wambo) Project for historic heritage items listed in the 2016 Historic Heritage Assessment, undertaken as part of a suite of studies related to the EIS for the above-mentioned project.

The purpose of the HHMP subsequent to this study is to provide a description of the measures to be implemented by United Wambo to manage and protect known heritage values within and in the vicinity of the project area. All the items listed for management are located in the Singleton Local Government Area.

Sections 5, 6 and 7 of the HHMP contain the key information which lists the items identified, assesses their individual heritage significance and outlines management parameters for them. The review has found the report successfully captures those items in the mine project area and discusses those outside the project area. The HHMP discusses the nature of the risk to heritage items located outside the project area, with perhaps one omission, as discussed further below.

Whilst there is no doubt mapping of the various heritage items has likely been undertaken, it was difficult to identify where certain items were situated in relation to the mine project area as no map is provided. To ensure adequate management controls are in place for local heritage items likely to be affected by the project, and to

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ensure those identified in the 2016 Environmental Impact Statement had been included in the HHMP, the reader will need to cross reference the application documentation to find a figure that contained most of this information. It is therefore recommended a revised figure showing the location of all items discussed in the report be added into the HHMP.

It appears local heritage item I30 (as listed in Schedule 5 of the Singleton Local Environment Plan 2013), which is the Old Anglican Cemetery at Jerrys Plains, Lot 11, DP658775 on the Golden Highway may be situated close to, or inside, EL7211. As mentioned above there is no mapping to show proximity of this particular item and so it is unknown if this item is at risk, or if it has been assessed and identified already as being outside of impact and therefore not considered. The proponent should advise Council accordingly.

Of note to council is that many of the items discussed in the report are not listed on the LEP at all. Below is a table of items in the vicinity of the mine project area that perhaps merit inclusion.

Item Name	Location	Coordinates (MGA)	Listing and Significance
The former Warkworth Public School	Warkworth	314356.24, 6394899.78	No statutory listing. Local significance
Springwood Homestead	Warkworth	314410.89, 6393600.87	No statutory listing.

It should also be noted the former Warkworth Public School is potentially susceptible to damage from ground vibration.

In closing, the HHMP management protocols and timeline for actions appear comprehensive and in line with expectations for managing historic heritage over the next two years. Council has no requirements above or beyond what is already proposed. However, it is requested that the following be considered:

- The proponent should prepare a clear figure showing the location of all historic heritage items discussed in the HHMP in relation to the mine project area including exploration areas or similar, proposed for future expansion and provide it to Council.
- The proponent provide clarification that local LEP heritage item I30, which is the Old Anglican Cemetery at Jerrys Plains, Lot 11, DP658775 situated on the Golden Highway is not at-risk from current or future mining activities.
- Further details be provided for those heritage items listed in the HHMP that are not listed on the Singleton Local Environment Plan 2013, to enable Council to assess their potential inclusion on future revisions to Schedule 5 Environmental Heritage of the Singleton Local Environment Plan.

I would like to thank the Project for the opportunity to provide comment on the Historic Heritage Management Plan. Should you have any questions or comments, please

contact Mary-Anne Crawford, Manager Development and Environmental Services on 02 6578 7290.

Yours faithfully



Mary-Anne Crawford
Manager Development and Environmental Services

Appendix B - Research Design and Methodology

This Research Design including an Archaeological Excavation Methodology (herein referred to as 'Research Design and Methodology') has been prepared by Umwelt (Australia) Pty Limited (Umwelt) on behalf of United Wambo Joint Venture (herein referred to as 'United Wambo').

This Research Design and Methodology has been prepared as part of the Historic Heritage Management Plan (HHMP) for the United Wambo Open Cut Coal Mine Project (the Project). This document has been prepared in response to the outcomes of consultation undertaken with the NSW Heritage Branch regarding the Project to date, as well as to address commitments made in the Environmental Impact Statement (EIS) and Heritage Impact Statement (HIS) prepared for the Project by Umwelt (2016).

Any archaeological investigation is to be undertaken by a suitably qualified and experienced archaeologist, as per condition B82 e) (iii) of SSD 7142.

B.1 Research Design

B.1.1 Introduction

A research design is an important prerequisite for an archaeological investigation. A research design is a set of research questions developed specifically for a site within a wider research framework to ensure that when the archaeological resources of the site are destroyed by excavation, their information content is preserved and can contribute to current and relevant knowledge about the past. An archaeological research design aims to ensure that the excavation of an archaeological site is managed in a way to recover information available through no other technique.

A fundamental requirement of an archaeological research design is that the questions posed must be responsive to the nature of the archaeological evidence that is likely to be encountered. However, the nature of an archaeological resource cannot be accurately determined until excavation commences. It is essential that the research design is adaptable and can be revised as the nature and extent of the resources within the site become better understood. With the better understanding of an archaeological resource, more informed management of the remains can be undertaken.

B.1.2 Research Framework

Archaeological investigation should consider physical evidence associated with the following potential heritage sites identified as part of the HIS for the Project (Umwelt 2016).

Former House Site

- Located to the north of Redbank Creek within Lot 55 DP 753792 and comprises evidence of three former structures in the form of brick and sandstone rubble and concrete slabs. There is also an approximately two-metre diameter, 1.8 metre deep circular brick built, roughly mortared cistern; scatters of thin sandstone pavers; and some evidence of ceramic and glass artefactual material, including a clear glass coffee and chicory essence bottle. The former house site is considered to have been constructed by Isaac Frith between 1868 and 1871.

Shearing Shed and Creamery

- Located between Redbank Creek (to the south) and the Golden Highway (to the north), this site comprises two timber sheds, the 'shearing shed' and a former 'creamery building'. The shearing shed and creamery buildings are located on the 80-acre (32.4 ha) Lot 134 DP 753792. The site is likely to have comprised a federation period small farm site constructed and operated by

Robert Moss between 1919 and 1969. The main house has been demolished and there is no evidence of it remaining; it is now a levelled area with picnic benches for passing motorists. There is a derelict concrete sheep dip to the rear of the shearing shed and a brick built in-ground cistern immediately in front of it.

Consideration should be given to the historical development, use and occupation of these sites within a broad thematic context as well as within a local and site-specific context (Heritage Council NSW 2001).

B.1.3 NSW Historical Themes

A historical theme is a research tool, which can be used at the national, state or local level to aid in the identification, assessment, interpretation and management of heritage places (AHC 2001:1). The development of the Project Area can be assessed in the context of the broader historic themes defined by the Heritage Branch and AHC. In accordance with the Heritage Branch and AHC framework of historic themes, the themes in **Table 10-2** are relevant to the Project Area and locality.

Table 10-2: Historic Themes

Australian Theme	New South Wales Theme
Peopling Australia	Aboriginal cultures and interactions with other cultures
	Migration
Developing local, regional and national economies	Commerce
	Industry
Building settlements, towns and cities	Towns, suburbs and villages
Working	Labour
Developing Australia's cultural life	Leisure

B.1.4 Research Questions

An archaeological research design is developed in order to establish a series of general and site-specific questions for the archaeological investigation of a site. The research design develops a series of questions aimed to confirm the historical record and, most importantly, identify and record the physical information to supplement and provide information that may not be recorded in the historical record, prior to partial and/or complete removal of the archaeological resource.

In order to achieve the above and the aforementioned identified objectives, the following research questions have been established in order to guide the Phase 1 monitoring works. Following the completion of Phase 1 Works and prior to the commencement of Phase 2 Works (detailed investigation), if determined to be required, the research questions will be revised by the nominated Excavation Director. Revision of the research questions will be undertaken to respond more directly and clearly to the historical evidence of the site, the significance of the site and the historic themes identified in **Table 10-2** as required.

Relevant research questions for Phase 1 monitoring works are:

- is there physical evidence of previously identified surface features?
- is there physical evidence of a former house or other related structures at the former house site?
- is there physical evidence of the former main house at the shearing shed and creamery site?
- is there archaeological evidence within the cisterns present at the former house site, and shearing shed and creamery site?
- what is the level of sub-surface integrity across the two sites, and is there a correlation between the level of disturbances and/or fill deposits and the exposure of archaeological remains?
- is the archaeological evidence able to contribute to the understanding of the historical development of the local area?
- how do the archaeological features and remains and sub-surface integrity compare to historic archaeological sites within the vicinity of the Project Area?
- are there any deposits/ features that contain artefacts and, if so, what do they reveal about the inhabitants of the sites, in particular the former house site?
- if present at the former house site, what can the artefactual assemblage tell us about living conditions and the socio-economic context of a small farmstead enterprise from the mid nineteenth to early twentieth centuries?

B.2 Excavation Methodology

B.2.1 Introduction

An excavation methodology is prepared to recommend specific methodologies with regards to the archaeological investigation of a site or sites. The recommendations will vary depending on the type and size of the site, the potential archaeological resource and its significance and the level of impacts resulting from the proposed development. Methodologies (recommended by the Heritage Branch) could include no further action, archaeological monitoring, test excavation, archaeological excavation, or in situ conservation (Heritage Office 1996:8).

B.3 Excavation Program and Methodology

The main aim of the archaeological program is to identify the location and fabric of any potential structures or other archaeological material that may be present at either the former house site or the shearing shed and creamery site.

As the location of former buildings or other elements (such as infrastructure) within these two sites is not known, a program of archaeological monitoring is recommended (Phase 1 Works). The program of monitoring may result in more detailed investigation and recording of certain areas if intact archaeological remains are identified (Phase 2 Works). The abovementioned phased approach would be undertaken across those areas identified as requiring excavation works associated with the Project.

In addition to the above, a program of targeted archaeological investigation is recommended for the cisterns present at both two sites (Targeted Works).

B.3.1 Phase 1 Works – Archaeological Monitoring

Archaeological monitoring of initial machine stripping/clearing of current ground cover/topsoil would be undertaken where all excavation works are to occur.

All machine excavation is proposed to be undertaken under the direction of the approved nominated Archaeological Excavation Director. The monitored machine work will continue until archaeological material (if present) has been encountered and/or the maximum depth of excavation required for the approved works.

In the event that archaeological monitoring works uncover intact archaeological remains, further investigation and recording in these areas would be undertaken before works can proceed. The archaeological Excavation Director will need the authority to halt site works, as necessary, to undertake further investigation and/or detailed recording, if required, of any remains exposed.

In the event that archaeological monitoring works identify archaeological features and/or relics during the archaeological monitoring works, the remains would be recorded in accordance with best practice standards as outlined below in **Phase 2**. Machine excavation work would not recommence in these areas until directed by the approved Excavation Director on site and once the remains have been appropriately assessed and recorded.

B.3.2 Phase 2 Works – Detailed Archaeological Investigation

The historical archaeological investigations would be undertaken under the direction of the approved nominated Archaeological Excavation Director. The Phase 2 investigations would be undertaken where archaeological remains have been exposed during Phase 1 works.

All historical archaeological excavation would be undertaken to normal professional standards. Phase 2 works would include comprehensive archaeological investigation of all identified archaeological remains in order to recover information through the excavation and recording of the archaeological remains and, thus, realise any archaeological research potential the sites may have.

Where required, detailed historical archaeological investigation should continue until:

- the nominated Archaeological Excavation Director is satisfied that the research potential of the subsurface deposits/archaeological remains has been realised;
- culturally sterile deposits have been encountered; or
- the maximum depth of excavation required for the approved development of the sites has been reached.

B.3.3 Targeted Works – Cisterns

Cisterns are present at each of the two sites. Owing to their nature and construction, cisterns have the potential to contain archaeological material. As such, the cisterns at each site will be subject to targeted investigation prior to their removal as part of the Project.

- If possible, and depending on the depth of the cisterns, they will initially be excavated by hand to recover any artefactual material that may be present and to identify and record the nature of their construction.
- In the event that the cisterns are too deep to allow for non-intrusive hand excavation, the cisterns may be half-sectioned by mechanical excavator under archaeological supervision, to identify and record the nature of construction, the depth of survival and to record and/or investigate any internal deposits (including the recovery of any artefactual material that may be present).
- In the case of the former house site and as it is located within an area of approved bulk excavation, the surrounding area could be progressively excavated by machine to allow for the safe excavation of the cistern.

- If, at any stage, the archaeological investigations are determined to pose a safety risk due to the depth of excavation or any issues concerning the stability of the excavation site, it will be the responsibility of the nominated Excavation Director to re-configure and/or cease works. Any re-configuration and/or cessation of works due to safety concerns must be detailed in the associated post-excavation reporting.

B.4 Archaeological Recording

Any archaeological remains exposed during Phase 1 and 2 archaeological investigation/excavation works would be recorded in accordance with the requirements of the Heritage Branch and accepted best practice procedures. All archaeological investigations, including machine monitoring, would be recorded in the following way:

- scale photographs would be taken;
- all archaeological remains (whether a cut, fills, feature, work or relic, etc) would be defined, manually excavated, recorded and given either an appropriate feature or context number as outlined below:
 - all archaeological remains would be recorded on individual recording sheets,
 - all archaeological remains would be drawn to scale with scaled plan and section drawings also produced across each excavation area and across the two sites,
 - a photographic record would be undertaken across the two sites with a focus on all archaeological relics and features identified. All photographs associated with each context, cut, feature, work and/or relic would also be recorded on the corresponding record sheet;
 - a Harris matrix would be developed incorporating all context, cut, fill, feature, work, relic and surfaces identified, and recorded;
 - all surfaces contexts, cuts, fills, features, works and relics would be recorded by a surveyor providing accurate spatial and temporal data across the two sites; and
 - all recovered movable heritage items/artefacts would be cleaned, bagged and archived according to the contexts from which they were recovered. They would be retained and recorded using standard recording methods. Where possible, initial processing of artefacts and other preliminary analysis, and any required conservation treatment, would occur on site during the excavation phase. The detailed analysis and cataloguing of artefacts would be undertaken as part of post excavation works and the results included in the final archaeological report.

B.5 Post Archaeological Excavation Recording and Reporting

Following finalisation of the historic archaeological investigations at either of the two sites, a summary of archaeological program will be prepared and forwarded to the Heritage Branch in accordance with consultation undertaken to date and the HHMP prepared for the Project.

As part of the post fieldwork analysis, all artefacts would be subject to comprehensive analysis. It is noted that United Wambo is responsible for the post analysis storage of any historical artefacts or samples collected from the sites and should arrange for the collection to be stored in an appropriate repository, preferably within the Project Area. At the completion of the archaeological investigation and reporting, a suitable storage facility will be nominated by United Wambo in which to store artefacts retained from the excavations.

The results of all historical archaeological investigations, including the archaeological monitoring works, would be collated into one over-arching historical excavation report for each site. The final

excavation report would discuss the results of the investigations and the site formation and post depositional processes. Using the data gathered in conjunction with the data collated as part of the HIS (Umwelt 2016), the report would discuss the results and determine if the objectives of the investigations have been met and answer all research questions (as outlined in the Research Design *Section B.1*).

The format, content and length of the report will be determined by the nature and extent of the archaeological remains uncovered during archaeological investigation and the size of the artefact collection recovered from the site (Heritage Office 1996). The report would also include:

- a description of the results of the investigation;
- a formal response to the research design;
- the results of post excavation analysis of artefact collection; and
- primary site records, including measured drawings, digitised photographic data, context sheets, Harris matrix data and all survey data.

The report would also reassess the heritage significance of the identified archaeological resources and the archaeological potential of the two sites. The report would be submitted to the Heritage Branch and the Singleton Council.

B.6 Care and Control Strategy

As noted at *Section B.5*, United Wambo is responsible for the storage of any historical artefacts or samples collected from the site and should arrange for the collection to be stored in an appropriate repository.

At the completion of the archaeological investigation and reporting, a suitable storage facility will be nominated by United Wambo in which to store artefacts retained from the excavations. United Wambo will be responsible for the long-term management of any recovered artefacts. Long-term management may include the conservation of artefacts.