

MGO
MT OWEN / GLENDELL

GLENCORE



Historic Heritage Management Plan

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1 Commitment and Policy

1.1 Background

This Historic Heritage Management Plan (HHMP) is one of a series of Environmental Management Plans that together form the Environmental Management System for Mount Owen / Glendell Operations (MGO).

Current and approved mining operations within MGO include:

- Mount Owen North Pit
- Ravensworth East (Bayswater North Pit)
- Glendell Barrett Pit.

Mining operations at the MGO include the integrated use of the Mount Owen coal handling and preparation plant (CHPP), coal stockpiles and rail load-out facility.

This HHMP documents procedures for management of historic heritage values within the approval area for Mount Owen Continued Operations (Mt Owen) Development Consent (SSD 5850) and Glendell Mine Development Consent (DA 80/952).

A modification, 'MOD 1' of SSD 5850 was approved by the NSW Department of Planning and Environment (DP&E) on 19 September 2017. The modification approves the construction and operation of a water pipeline from Integra Underground Operations to MGO.

A modification, 'MOD 2' of SSD 5850 was approved by the NSW Department of Planning, Industry and Environment (DPI&E) (formerly DP&E) on 4 September 2019 permitting the recovery of an additional 35Mt of ROM Coal from the North Pit and extending Life of Mine to 2037.

The following figures provide context for this HHMP, namely:

- **Figure 1-1** shows the location of the MGO
- **Figure 1-2** shows the area in which this HHMP is applicable (the HHMP Area)
- **Figure 1-3** shows the development consent boundaries for both the Mt Owen (SSD 5850) and the Glendell Mine (DA 80/952). Together, these constitute the HHMP Area.

Figure 1-1 – HHMP Area location map

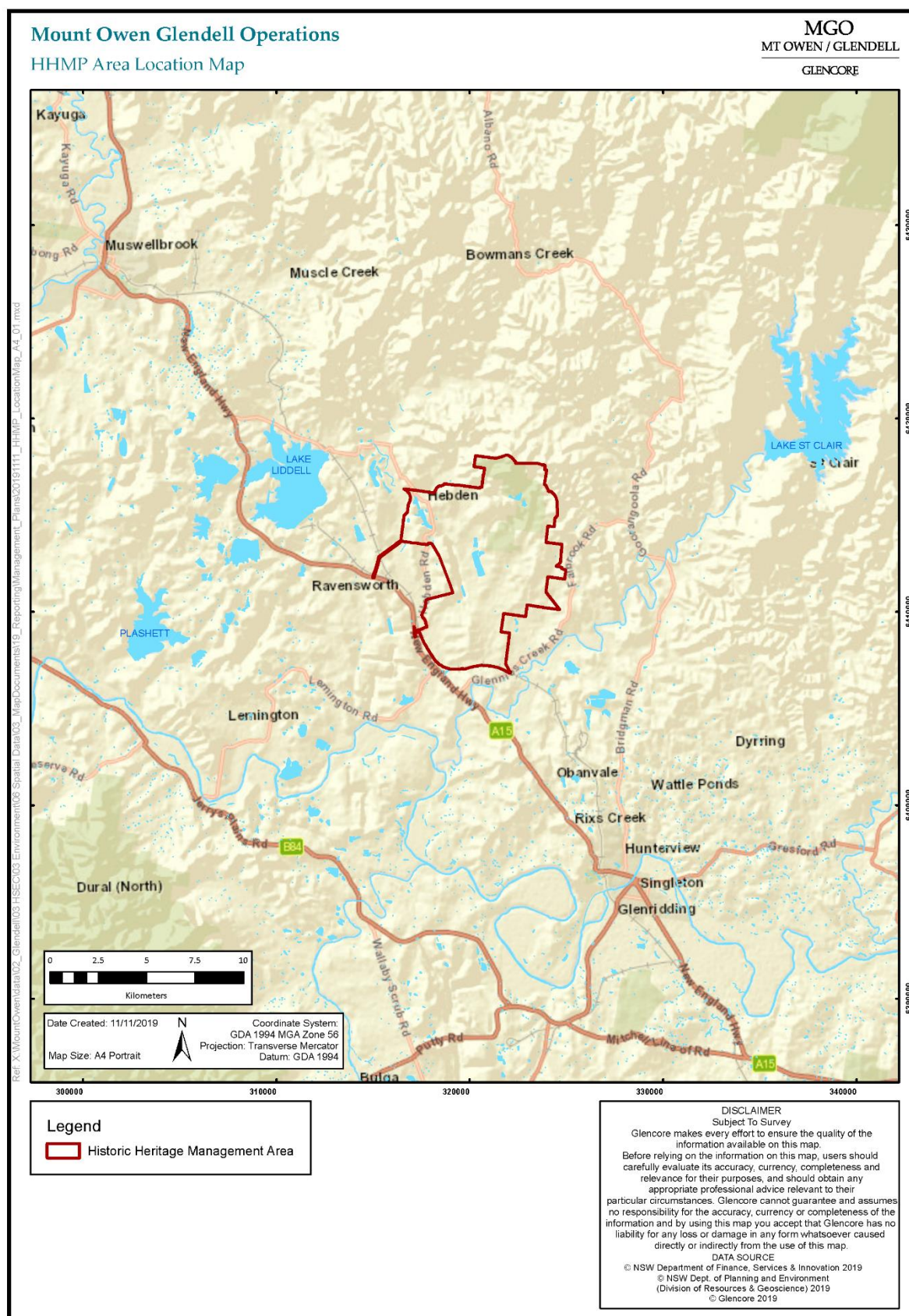


Figure 1-2 – HHMP Area

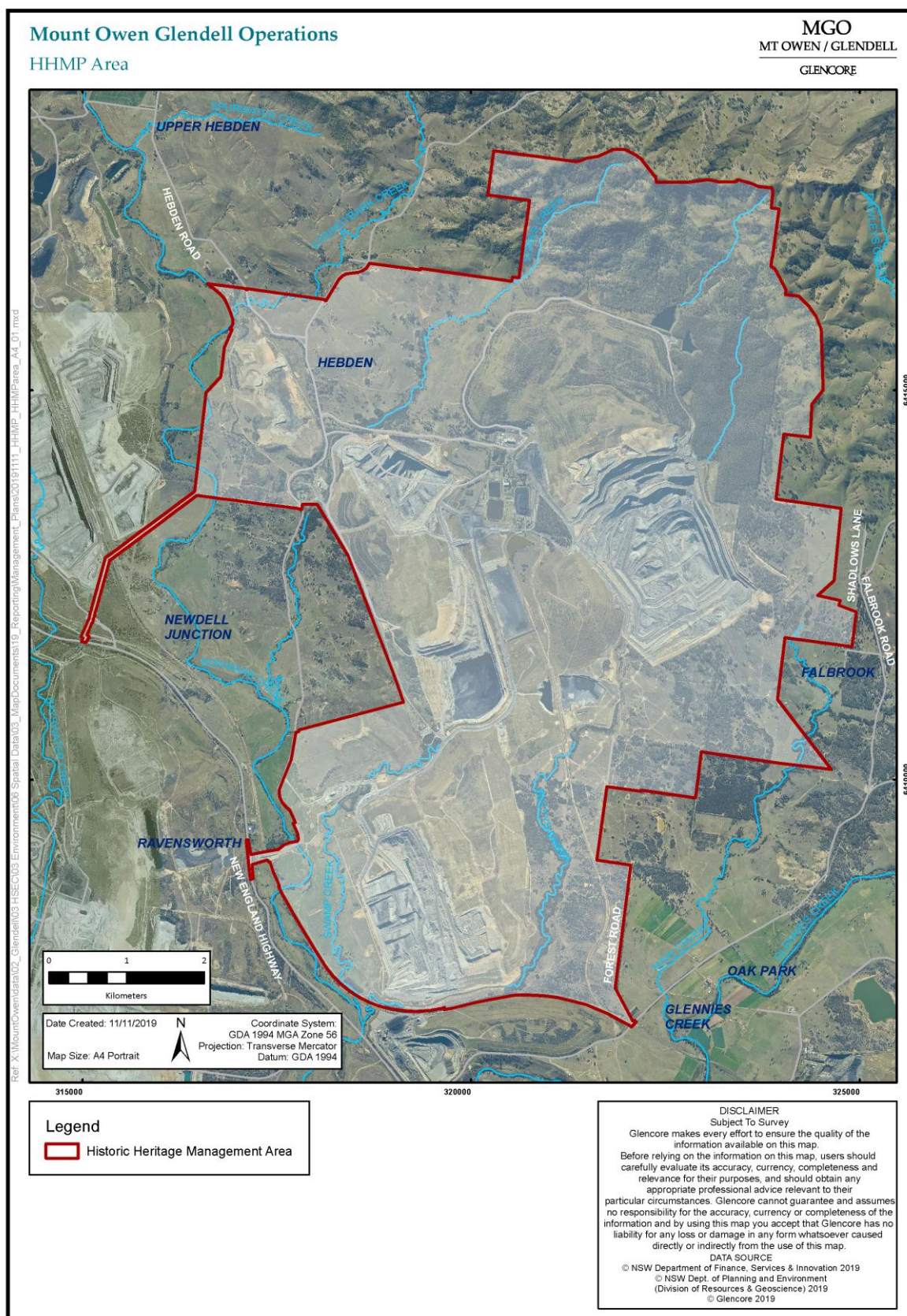
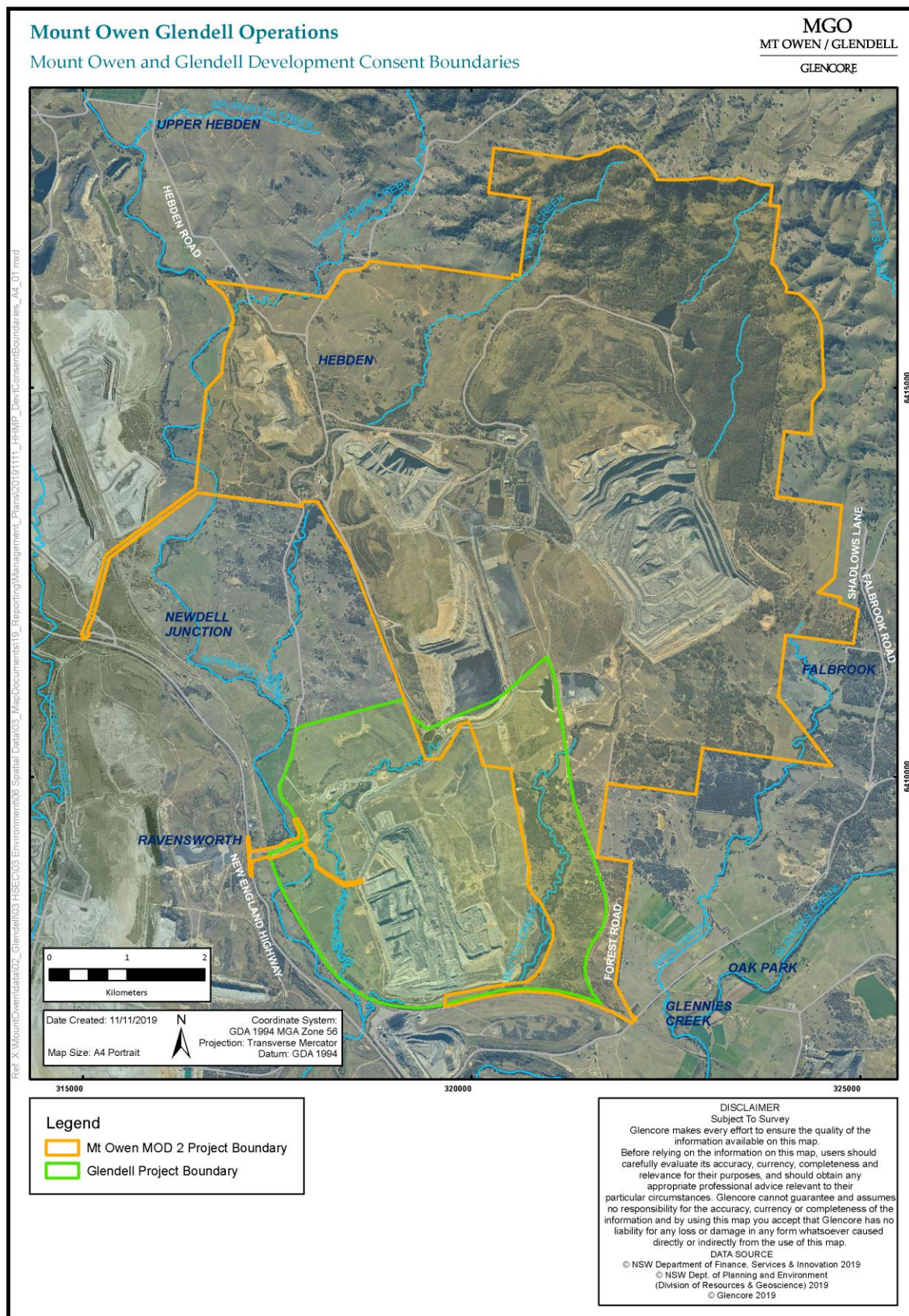


Figure 1-3 – Mount Owen and Glendell Development Consent Boundaries



1.2 Objectives of the Historic Heritage Management Plan

This HHMP addresses the historic heritage and archaeological management issues associated with MGO. It does not include a heritage management strategy with regards to Aboriginal cultural heritage. The management of Aboriginal cultural heritage is addressed in the MGO Aboriginal Cultural Heritage Management Plan (ACHMP).

The purpose of this HHMP is to provide a description of the measures to be implemented by Glencore to manage and protect known heritage values within and in the vicinity of MGO.

1.3 MGO – Historic Heritage

1.3.1 Mount Owen

A comprehensive assessment of the potential impacts of Mt Owen Continued Operations on historic heritage values was completed as part of the Environmental Impact Statement (EIS) for the Mt Owen Continued Operations Project. The assessment is included as Appendix 14 (*Historic Heritage Assessment – Mount Owen Continued Operations Project* (Umwelt 2014)).

This Assessment identified no sites/items with any statutory heritage listing. Several listed items were identified in the vicinity of the Mt Owen Continued Operations Project Area.

The Ravensworth village area was assessed in Umwelt 2014 as having local heritage significance and archaeological research potential. Umwelt 2014 recommended that prior to the commencement of works associated with the Hebden Road upgrade works that on-site archaeological investigation of the area proposed to be impacted be undertaken. These archaeological investigations were completed in 2017 (OzArk 2017).

No further management of sites is required at Mt Owen.

1.3.2 Glendell

In 2007, Umwelt prepared a historical heritage assessment, as part of an Environmental Assessment (EA) to seek project approval for the modifications of the Glendell Mine development consent. The report provided an assessment of the impact of the modified Glendell operations on historical heritage within and surrounding the disturbance area.

The management strategy developed as part this historical heritage assessment included the archival recording of all heritage items identified within the disturbance area to the standards of local heritage significance as specified by the guidelines of the NSW Heritage Office. This recording also includes all heritage items within the Glendell mine site that may be indirectly impacted by proposed blasting as these sites were assessed as being in a fragile condition.

The archival recording of all historical heritage items that may, directly or indirectly, be impacted as a result of proposed mining as part of Glendell Open Cut Mine was undertaken in accordance with Condition 45 of modified DA 80/952 (refer to Umwelt 2008).

No further management of sites is required at Glendell.

2 Requirements of the Historic Heritage Management Plan

2.1 Statutory Requirements

Both the Mt Owen (SSD 5850) and Glendell Mine (DA 80/952) development approvals stipulate requirements related to this HHMP. These are summarised in **Table 2-1**.

Table 2-1 – Relevant Development Consent Conditions and Commitments

Mount Owen Continued Operations (SSD 5850)	Glendell Mine (DA 80/952, Schedule 4)	Condition	Relevant Section of the HHMP
35		Historical Heritage Management Plan The Applicant must prepare a Historic Heritage Management Plan for the development to the satisfaction of the Secretary. This plan must:	
		(a) be prepared in consultation with the Heritage Branch ¹ , Council, local historical organisations and relevant landowners, and submitted to the Secretary for approval prior to the commencement of development under this consent, unless the Secretary agrees otherwise; and	Section 5.1 , Appendix A, Appendix B
		(b) include the following for the management of historic heritage:	
		plans/strategies to monitor, mitigate and manage the effects of blasting on historic heritage items, particularly those identified in condition 13(b) ² , and including details of baseline (ie pre-blasting) and ongoing risk-based dilapidation surveys (subject to landowner access arrangements);	Section 5.4
		ensure any workers on site 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 5.5.3
		a program and description of the measures/procedures that would be implemented for:	
		undertaking surface surveys and archaeological investigations (where subsurface disturbance is proposed) of any items of heritage significance (including the former Ravensworth Public School and Ravensworth village) that would be directly impacted by the Hebden Road construction works;	Completed (see Section 5.2.2, 5.2.3 and OzArk 2017)
		protecting heritage items located outside the disturbance area from the impacts of the development;	Section 5.2 and 5.3
		managing any new historic heritage items discovered during the development; and	Section 5.5.1

¹ The Heritage Council (formerly the NSW Heritage Branch and Heritage Office) is a part of the NSW Office of Environment and Heritage.

² Condition 13b. Ensure that blasting on the site does not damage heritage items, and develop specific measures to protect the Ravensworth Homestead, Chain of Ponds Inn, Kangory (Dulwich) Homestead, Former Hebden Public School and John Winter Memorial from any blasting damage associated with the development.

		additional archaeological excavation and/or recording of any significant heritage items requiring demolition.	Section 5.5.1
		The Applicant must implement the approved Historic Heritage Management Plan as approved from time to time by the Secretary.	Section 6.3
Mt Owen Continued Operations Commitments			
		Prior to the commencement of works for the construction of the Hebden Road upgrade works and if any physical or sub-surface impacts are proposed in the area to the north of Hebden Road, the area will be surface surveyed to identify, or confirm the absence of, the potential for items or remains that may be associated with the listed former Ravensworth Public School.	Completed (see Section 5.2.3 and OzArk 2017)
		If any potential items or remains are identified, management measures will be developed by Mount Owen in consultation with the Heritage Branch ³ to ensure the items or remains are protected or, if appropriate, mitigated.	Section 5.5.1
		Prior to the commencement of works for the construction for the proposed Hebden Road upgrade works, on-site archaeological investigation of the associated portion of the Proposed Disturbance Area will be undertaken.	Completed (see Section 5.2.2 and OzArk 2017)
	45	The Applicant must prepare an archival record of the heritage items listed in the table in Appendix 7 (see Table 5-1 , prior to any activity associated with the development that may disturb these sites, in consultation with, and in accordance with the requirements of, the Heritage Branch, and to the satisfaction of the Secretary.	Completed (see Section 5.3.9 and Umwelt 2008)
Glendell Mine Commitments			
	1.13.1	The Applicant will commission archival recording of sites identified within the Glendell Mine site by a qualified heritage consultant to Heritage Branch's standards of local significance prior to the commencement of mining.	Completed (see Section 5.3.9 and Umwelt 2008)
	1.13.2	Install fencing to protect remaining sites (Items 4a to 4d and Item 5) to manage these <i>in situ</i> .	Section 7
	2.1.9	Historic Heritage item 7g will be identified in the field to ensure it is not disturbed by MOD 3 activities.	Section 7
	2.1.10	The dilapidated shed associated with Historic Heritage item 8b will be manually dismantled, with salvaged materials removed from site.	Completed (see Section 5.3.10)

³ See footnote 1.

3 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 HHMP Area prepared as part of past historical heritage assessments to provide an understanding of the significance of any heritage sites within the HHMP Area. The assessments should be referred to for the full historical context of the HHMP Area.

3.1 Land Use

Historical research shows that from the 1820s to the 1970s, the HHMP Area has been predominantly used for grazing sheep and cattle. Pastoral grazing was the earliest established industry within the region of the Mt Owen Continued Operations Project Area, which was first settled in the 1820s. Pastoralism has been the dominant historical land use and although no longer the dominant land use, the area's pastoral history is evidenced by the history of clearance of native vegetation and construction of infrastructure such as dams and fences along with homesteads and other rural structures. There was a shift from wool production in the nineteenth century as mixed farming, dairying and grazing became more important in the twentieth century. Dairying was one of the initial impetuses for the division of large estates in the Upper Hunter; like that of the Blaxland family's Fordwich estate. By the 1890s dairying had become an important industry in the Upper Hunter and remained so until the second half of the twentieth century when the industry went into a gradual decline (Umwelt 2014).

Today's Broke-Fordwich Wine Region has its beginnings with the early settlers experimenting with growing vines on their large estates; the Reverend Richard Hill is reported to have planted over two and a half thousand vines on his Milbro Dale Estate by 1834. However, it was not until the dairying industry declined in the second half of the twentieth century that wine growing really began to grow in importance in the region (Umwelt 2014).

The development of coal resources in the late twentieth century also comprises an important part of the area's history. Coal was not commercially exploited in the Upper Hunter until the 1890s. In the 1950s a rapid expansion of coal mining in the area took place with the establishment of large open-cut mines. Mining at the MGO commenced in the 1960s at the former Swamp Creek Mine.

3.2 Ravensworth Village

The Ravensworth village comprised a small community, based around a train station, post office, public school and a long established wine store/saloon. Prior to 1876, the small village grew around the needs of workers on the railway and the Ravensworth Estate. The railway station opened on 1 June 1869, and in 1876 a half-time school was constructed in a slab building located close to Ravensworth Station. In 1880, the extant Ravensworth Public School at the corner of Hebden Road and the New England Highway opened.

The Ravensworth village was originally part of James Bowman's Ravensworth Estate. The Ravensworth Estate was 12,160 acres encompassing Bowmans Creek and Yorks Creek. The property was later expanded to include frontage to the Hunter River and by 1828 over 40 convicts and overseers worked on the property as shepherds, labourers, carpenters, sawyers, blacksmiths and stone masons.

Following the First World War, the Commonwealth and State Governments cooperated to initiate programs to enable returned soldiers to settle on their own farms to secure their own homes. In 1931, the Ravensworth Memorial Hall was officially opened and used for community balls. The Lot was owned by the 'Trustees for a Memorial Hall' until purchased by Glendell Tenements Pty Ltd. The existing road in the Ravensworth village area was formalised in 1952 when the road was dedicated to the public pursuant to the *Local Government Act 1919*.

3.3 Great Northern Road and Great Northern Railway

In the Upper Hunter area, roads were the most important means of transport until 1869 when the Great Northern Railway reached Muswellbrook.

The Great North Road was constructed between 1826 and 1836 using convict labour. The road was constructed to provide a route between Sydney and the rapidly growing settlements in the Hunter Valley. The northern section of the Great North Road linking the Upper Hunter Valley was planned by Surveyor General Major Thomas Mitchell with three branches, separating first at Wollombi and then again at Broke. Mitchell believed that the 'best, scientific or true roads were based on...the straightest lines possible'. The third planned branch stretched from Broke to Warkworth (including present Charlton Road) and construction started between 1834 and 1836. The history of the construction of these northern branches is not as well documented as southern portion of the road and these northern branches are not likely to have been fully completed.

The Great Northern Railway's first section was built from Newcastle to Victoria Street, Maitland in 1857. It then extended to Singleton in 1863, and stopped at the Ravensworth village railway station between 1869 and 1975. The railway station was originally named Camberwell Station but was renamed Ravensworth in 1876. The railway line in part diverges through the Ravensworth Estate and forms the southern boundary of the HHMP Area. The Ravensworth Station building was destroyed by fire in 1980 and remnants of the station building have since been removed.

4 Evaluation of Heritage Sites

Previous historic heritage assessments examined the historic heritage issues associated with the MGO with the aim of assessing and evaluating the potential heritage impacts of the mining operations. Reports identified the heritage items with some form of statutory listing in addition to the potential heritage sites/items both within, and in the vicinity of, the HHMP Area, along with a heritage impact statement and recommended mitigation and management measures for the sites/items that were assessed as being significant. The mitigation and management controls that will be implemented for these sites are discussed in **Section 5**.

Previous archaeological assessments have assessed the historic heritage sites/items present within, and in the immediate vicinity of, the MGO as having no heritage significance and no research potential. Following the 2017 archaeological investigations at the site of Ravensworth Village it was assessed that this area also had low archaeological potential. No further management is required for many of the identified heritage sites.

Figure 4-1 shows the location of heritage sites within the HHMP Area and adjacent region. Sites labelled 1–9 refer to the recorded historic sites within the Glendell mine area (see **Table 5-1**).

A number of these sites have been previously destroyed by approved mining activities, namely:

- Sites RE31 to RE33 – Archaeological investigation and reporting contained in *The Historical Archaeology of Ravensworth East Mine, near Singleton, NSW: Excavation and Recording of Sites RE31, RE32 and RE33*. Prepared by Umwelt for Xstrata Mt Owen (2006)
- Sites MOH1 to MOH4 – Archaeological investigation and reporting contained in *Historical Archaeology: Archival Recording and Excavation, Mt Owen Operations, Singleton, NSW*. Prepared by Umwelt for Xstrata Mount Owen (2006)
- Sites 2, 3, 6 and 9 – Archaeological investigation and reporting contained in *Archival Recording of Heritage Items, Glendell Mine*. Prepared by Umwelt for Xstrata Mount Owen (2008)
- Ravensworth Village site – areas to the south of Hebden Road within the approval area for Mount Owen Continued Operations (OzArk 2017)

Following their excavation and/or recording in accordance with the relevant approval conditions, RE31 to RE33, MOH1 to MOH4 and sites 2, 3, 6 and 9 have been removed as part of approved works. In general, these previously identified and managed sites were representative of early dairy farming in the Upper Hunter in the twentieth century, after F.J.L. Measures subdivided the Ravensworth Estate and sold the subdivided lots to prospective mixed farming and dairy enterprises.

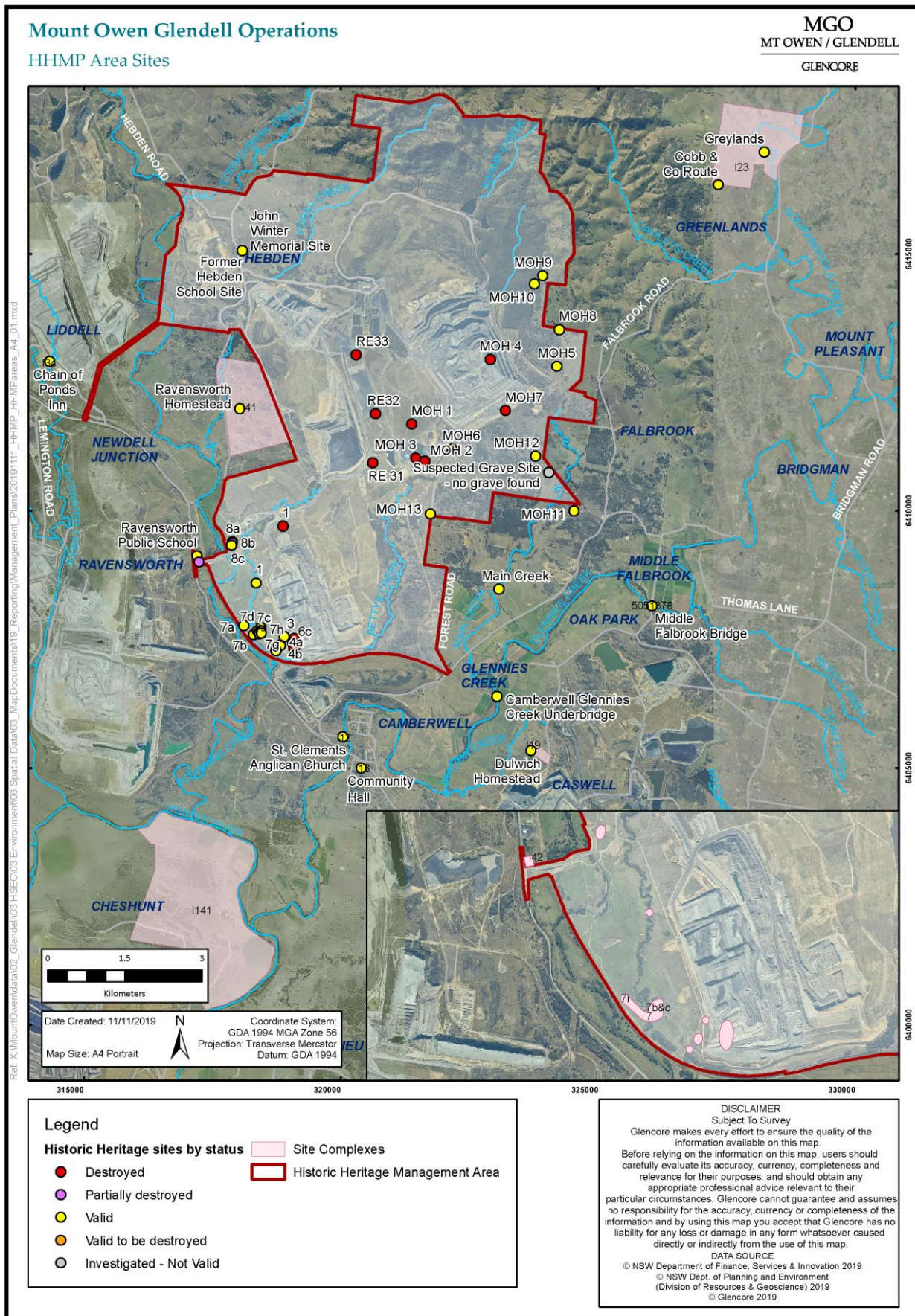
Ravensworth Village was subject of subsurface archaeological investigations that demonstrated that all deposits within the approval area for Mount Owen Continued Operations dated to the mid to late twentieth century. The deposits here demonstrated the vernacular occupation of the Ravensworth Village during its latest occupation phase.

Several heritage items with a statutory listing are located outside, but within the vicinity of, the MGO. These items are summarised in **Table 4-1** and shown in **Figure 4-1**.

Table 4-1 – Listed heritage items in the vicinity of the MGO

Heritage Item	Heritage Significance
Ravensworth Homestead	Local
Former Chain of Ponds Inn	State
Middle Falbrook Bridge over Glennies Creek	State
Greylands and Outbuildings	Local
Ravensworth Public School	Local
St. Clements Anglican Church	Local
Camberwell Community Hall	Local
Camberwell Glennies Creek Underbridge	Local
Former Dulwich Homestead (Kangory Homestead)	Local

Figure 4-1 – Listed and non-listed heritage sites within and surrounding the HHMP Area



5 Historic Heritage Management Strategy

This section of this HHMP details the historic heritage management strategy for the MGO and addresses the relevant aspects of Condition 35 of SSD 5850, Condition 45 for DA 80/952 (refer to **Table 2-1** and **Table 5-1**) and MGO's commitments in terms of the environmental management of the HHMP Area.

5.1 Consultation

5.1.1 Consultation with Internal (MGO) Stakeholders

This HHMP has been reviewed by members of the MGO Environmental Management System (EMS) Committee and endorsed at the meeting of 28 November 2016.

Consultation with External Stakeholders

The original version of this HHMP that included the methodology for the archaeological investigation at Ravensworth Village, was prepared in consultation with Singleton Council, Heritage Division (NSW Office of Environment and Heritage [OEH] (now Biodiversity & Conservation Division (BCD) of DPI&E) as delegate of the Heritage Council of NSW) and the Singleton Historical Society and Museum Inc.

The prevailing version of the HHMP includes no new management measures as it is being updated following the completion of the archaeological investigations at Ravensworth Village. Without new management protocols, further consultation on this version of the HHMP has not taken place. This revision was approved by DPI&E in October 2017. A copy of the DPI&E approval of the HHMP is in Appendix A.

The current draft revision of the HHMP was submitted to DPI&E on 2nd December 2019. This is an administrative revision post Mount Owen Continued Operations MOD 2 approval on the 4th September 2019. Currently awaiting DPI&E response.

All heritage items to be managed by this HHMP are located on land owned by Glencore Coal Assets Australia Pty Limited. As such, additional landholder consultation was not required.

5.2 Management of Direct Impacts

Heritage significance of all sites to be directly impacted are discussed in Umwelt 2014. Umwelt 2014: 5.7 concludes:

The (Mt Owen Continued Operations) Project Area is typical of a rural landscape within the Upper Hunter region of NSW. The history of the area from the early to mid-nineteenth century, including its settlement by Europeans and subsequent use as cleared pastoral and agricultural land through to its exploitation for mineral resources is reflected in the low potential of the archaeological resource and in the evidence of former house and dairy sites and other rural structures and infrastructure. Similar sites, both within the (Mt Owen Continued Operations) Project Area and in the immediate vicinity, have been assessed and recorded as part of previous heritage studies, archaeological investigative works and archival recordings. In general terms, with the exception of the Ravensworth Village area, the John Winter Memorial site and the former Hebden Public School site, the identified and potential historical heritage components of the (Mt Owen Continued Operations) Project Area have been assessed as having no significance with no research potential.

It is noted that of the sites identified by Umwelt 2014 as having heritage significance:

- Ravensworth Village area;
- the John Winter Memorial site; and
- the former Hebden Public School site).

Only the Ravensworth Village Area (southern portion) has been impacted by the Mt Owen Continued Operations Project. The John Winter Memorial site and the former Hebden Public School site are located well beyond the approved Disturbance Area and will not be directly impacted.

The Ravensworth Village area has been partially impacted as much of the former village, including those portions first settled, are to the north of the approved Disturbance Area, and will not be impacted. The southern portion predominantly dates to the twentieth century and was assessed in Umwelt 2014: Table 5.1 as possibly providing “a *tangible link to this period of the area’s history and would have research potential*”. However, the heritage significance of this portion of the village has been shown to be low with a very limited ability to meaningfully add to the research potential of the site.

5.2.2 Ravensworth Village

Ravensworth Village is located at the intersection of the New England Highway and Hebden Road. An approximately 180m by 100m area of the former village was located to the south of the existing Hebden Road and was impacted as a result of the Hebden Road upgrade works.

Prior to the commencement of works associated with the Hebden Road upgrade works, on-site archaeological investigation of the area proposed to be impacted was undertaken to normal professional standards. The aim of this investigation was to ascertain if the archaeological record matches, enhances or contradicts the written sources regarding the site examined in Umwelt 2014.

Following the archaeological investigation it was shown that all deposits within the approved Disturbance Area dated to the mid to late twentieth century and that there was no evidence, either in the form of built structures or artefacts, of nineteenth century occupation related to the Wolfgang Wine Shop.

As a result of these investigations, it was determined that the upgrade works at Hebden Road will have little adverse impact on the overall archaeological potential of Ravensworth Village.

5.2.3 Ravensworth Public School

Prior to the commencement of upgrade works for Hebden Road an ‘area of archaeological interest’ identified in Umwelt 2014 to the north of Hebden Road (within the approved Disturbance Area; **Figure 5-1**), was surveyed to identify, or confirm the absence of, the potential for items or remains that may be associated with the listed former Ravensworth Public School. This survey demonstrated that there has been considerable disturbance in this area and that there was no likelihood for subsurface deposits in the area impacted by the Hebden Road works.

A conservation protocol will be used in relation to the Disturbance Area on the north side of Hebden Road to ensure there are no physical or other impacts to the fabric of the former school buildings during the Hebden Road works.

The protocol will include:

- a) archival recording of the exterior of the 1880s Ravensworth Public School has been undertaken prior to construction associated with the Hebden Road upgrade works to ensure that a record exists in the unlikely event that the building fabric is in-directly affected by the construction
- b) minimising all ground disturbance within the ‘Area of Archaeological Interest’ shown in **Figure 5-1**. This includes minimal ground excavation to retrieve buried services
- c) no stockpiling of materials with the ‘Area of Archaeological Interest’ shown in **Figure 5-1**
- d) establishing a fenced buffer area to the south of the former school buildings along the northern boundary of the approved Disturbance Area
- e) ensuring that the areas to the north of the approved Disturbance Area (adjacent to the ‘Area of Archaeological Interest’ shown in **Figure 5-1**) are a no-go zone for vehicle parking, material storage, or personnel access
- f) ensuring that dust during construction is suppressed in the area adjacent to the Ravensworth Public School buildings
- g) ensuring that heavy machinery and resulting vibrations are minimised in the vicinity of the 1880s Ravensworth Public School. Should heavy machinery be required to excavate or bore within 20 metres of the 1880s Ravensworth Public School building (approximately equating to the areas to the east of the current verge of the New England Highway or areas to the north of the existing verge of Hebden Road), a qualified archaeologist should be on site to monitor the impact of this

work on the fabric of the building. Should impacts to the building fabric be noted, all work within 20 metres of the building will cease and an appropriate conservation strategy developed to ensure the integrity of the building fabric is maintained

- h) archival recording of the exterior of the 1880s Ravensworth Public School following construction associated with the Hebden Road upgrade works will be undertaken to ensure that a record exists to demonstrate that the building fabric has not been affected by the construction.

Figure -1 – Area of Archaeological Interest associated with the Ravensworth Public School



5.2.4 Hut on East Side of Bowmans Creek

The former location of a hut indicated to the east of Bowmans Creek on an 1889 subdivision plan of part of the Ravensworth Estate will be impacted as a result of the proposed Hebden Road works. However, there is unlikely to be any surviving archaeological evidence of the hut, which is likely to have been of a temporary construction with little potential for any intact archaeological resource. In addition, the former location of the hut is at the junction of current Hebden Road and an access track, and is also immediately adjacent to the current crossing of Bowmans Creek. As a result, the area has previously been disturbed.

No further management in relation to the former location of the hut on the east side of Bowmans Creek is required.

5.2.5 MOH6 – Former House Site

Site MOH6 comprises a former house site located within the HHMP Area and the approved Disturbance Area. The site will be impacted as part of works associated with the North Pit Continuation.

This site has been photographically recorded as part of the preparation of the 2014 Historic Heritage Assessment (Umwelt 2014; Appendix 1).

No further management of MOH6 is required as the site has no heritage significance.

5.2.6 MOH7 – Timber Yards

Site MOH7 will be impacted as part of works associated with the North Pit Continuation.

This site has been photographically recorded as part of the preparation of the 2014 Historic Heritage Assessment (Umwelt 2014; Appendix 1).

No further management of MOH7 is required as the site has no heritage significance.

5.3 Management of Indirect Impacts

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

Operations will undertake blasting in accordance with a detailed design process that will consider operational, geological and environmental constraints. Management of vibration impacts is considered in **Section 5.4**.

5.3.1 Former Hebden Public School Site

The former Hebden Public School Site is within the north-west corner of the MGO, but outside of any Disturbance Area. Vibration limits at the site have been identified as 16 to 19 mm/s. As such, there are not expected to be any impacts (either direct or indirect as a result of vibration from blasting) at the former Hebden Public School site.

This site has been photographically recorded as part of the preparation of the 2014 Historic Heritage Assessment (Umwelt 2014; Appendix 1). The site has also been fenced and signposted.

No further management of the former Hebden Public School site is required.

5.3.2 John Winter Memorial Site

The John Winter memorial site is within the north-western corner of the MGO, but outside of any Disturbance Area. The inferred safe vibration level for the John Winter Memorial has been identified to be in the order of 250 mm/s. From a blasting perspective, the memorial is constructed using very strong and homogenous materials that are not easily susceptible to damage by ground vibration movement (Enviro Strata Consulting 2014b).

This site has been photographically recorded as part of the preparation of the 2014 Historic Heritage Assessment (Umwelt 2014; Appendix 1). The site has also been fenced and signposted.

No further management of the former John Winter memorial site is required.

5.3.3 MOH5 – Former homestead and dairy complex

Site MOH5 will not be impacted as a result of the mining operations at the MGO. Site MOH5 has been photographically recorded in accordance with NSW Heritage Office guidelines in 2006 and 2010. A February 2013 site inspection noted that, apart from the continued natural degradation of the timber clad with corrugated iron dairy shed, the site appears to be in a similar condition to both its 2003 and 2010 photographically recorded condition. As two photographic recordings of the site have previously been undertaken, there has been no significant change to the condition and integrity of the site as a result of mining undertaken under current approvals.

As mining operations are moving further away from the site, no further management of site MOH5 is considered necessary beyond installing signage to protect the site. It is noted that the former Mount Owen Operations development consent (DA 14-1-2004, Condition 55, Schedule 2) states "*The Applicant shall prepare a photographic record of the condition and integrity of heritage site MOH5 (homestead and dairy), and to update this record every 5 years until the cessation of mining, to the satisfaction of the Director-General*". However, Umwelt 2014: 6.7 states "*As discussed, to date photographic recording in accordance with Consent Condition 55 has been undertaken in 2006 (Umwelt 2006b) and 2010 (Umwelt 2010). As two photographic recordings of the site have previously been undertaken, there has been no significant change to the condition and integrity of the site as a result of mining undertaken under the current approval and proposed mining as part of the (Mt Owen Continued Operations) Project will be moving further away from the site no further management of site MOH5 is required for the (Mt*

Owen Continued Operations) *Project*". This HHMP follows the advice in Umwelt 2014 that no further photographic recording of site MOH5 is required.

5.3.4 MOH8 – Timber Yards

Site MOH8 comprises an area of timber yards located within the HHMP Area but is not proposed to be impacted as a result of mining operations at MGO.

This site has been photographically recorded as part of the preparation of the 2014 Historic Heritage Assessment (Umwelt 2014; Appendix 1).

This site (comprising the timber yards) has been assessed as having no significance and no research potential.

No further management of site MOH8 is required to prevent inadvertent impact..

If any physical ground disturbance is proposed in the area as part of any future works consideration should be given to the area as the potential location of Russell's Station as marked on an 1855 *Plan of 2 Sections of Land: County of Durham; Parish of Vane*.

5.3.5 MOH9 – Timber Yards and former House Site

Site MOH9 comprises an area of timber yards adjacent to a fenced former house site located within the HHMP Area and within an existing biodiversity offset area. The site is not proposed be impacted as a result of mining operations at MGO.

This site has been photographically recorded as part of the preparation of the 2014 Historic Heritage Assessment (Umwelt 2014; Appendix 1).

This site has been assessed as having no significance and no research potential.

No further management of site MOH9 is required to prevent inadvertent impact to the site.

5.3.6 MOH10 – Timber Loading Ramp

Site MOH10 comprises a timber and earth constructed loading ramp located within Ravensworth State Forest and within the HHMP Area. The site is not proposed be impacted as a result of mining operations at MGO.

This site has been photographically recorded as part of the preparation of the 2014 Historic Heritage Assessment (Umwelt 2014; Appendix 1).

This site has been assessed as having no significance and no research potential.

No further management of site MOH10 is required.

5.3.7 MOH11 – Former House and Dairy Site

Site MOH11 is located immediately outside the MGO boundary. There is potential for some impacts to occur as a result of vibration. However, the site is currently a standing ruin and will remain a standing ruin standing in a rural landscape.

This site has been photographically recorded as part of the preparation of the 2014 Historic Heritage Assessment (Umwelt 2014; Appendix 1). No further management of site MOH11 is required.

5.3.8 MOH12 – Former House Site

Site MOH12 is located within the HHMP Area and immediately outside the approved Disturbance Area. There is potential for some impacts to occur as a result of vibration. However, the site is currently a standing ruin and will remain a standing ruin located in a rural landscape.

This site has been photographically recorded as part of the preparation of the 2014 Historic Heritage Assessment (Umwelt 2014; Appendix 1).

No further management of site MOH12 is required beyond installing signage to prevent inadvertent impact to the site.

5.3.9 MOH13 – Timber Cattle Yards

MOH13 is located outside the MGO Project Boundary. MOH 13 will not be impacted by mining activities at MGO.

This site has been photographically recorded as part of the preparation of the 2017 Integra to Mount Owen Complex Water Pipeline Modification 1 Environmental Assessment (Hansen Bailey, 2017).

This site has been assessed as having no significance and no research potential.

No further management of site MOH13 is required beyond signage to prevent inadvertent impact to the site.

5.3.10 Sites 1 to 9 (Glendell)

As part of the Glendell EA, Umwelt provided a detailed assessment of historic heritage (Umwelt 2007) that included management and mitigation measures which considered the impact of Glendell Mine on nine historical heritage items (Sites 1 to 9, see **Table 5-1**, **Figure 4-1**) within and surrounding the approved Glendell Disturbance Area.

The management strategy developed as part of the Glendell EA Heritage Assessment included the archival recording of all heritage items identified within the approved Disturbance Area to the standards of local heritage significance as specified by the guidelines of the Heritage Council.

Condition 45 of DA 80/952 required a record all historic items through archival photography to be undertaken. This has been completed (see Umwelt 2008). A copy of the receipt of this report by DP&E and its adequacy in satisfying Condition 45 of DA 80/952 is included in **Appendix B**.

Extant items outside the Disturbance Area which are not to be indirectly impacted by proposed blasting were fenced off, protected and conserved *in situ*.

During works associated with Glendell Mine Modification 3, it was determined that the eastern-most sub-site of site 7 (site 7g: 'yards in paddock') was located within 50 metres of the approved electricity easement but was able to be avoided by the works. A shed associated with Site 8 (Site 8b), had to be removed to facilitate the powerline relocation, but a second shed associated with Site 8b was not removed during the powerline relocation.

Table 5-1 – Glendell Mine heritage items for which archival recording has been undertaken

Item ID	Complex	Description
1	-	Wooden bridge across Swamp Creek to the west of the former Marali homestead site.
2	-	Tree stump bearing surveyors mark. Within approved mining area (destroyed).
3	-	Cattle yard remains. Within approved mining area (destroyed).
4a to 4d	Unidentified Potential Dairy Site	Sandstone and conglomerate concrete footings (Items 4a and 4b); mortar lined drain/gutter (Item 4c); machine made and sandstock wire cut bricks (Item 4d).
5	-	Corduroy road remains.
6a to 6l	Unidentified Ruined Homestead	Peppercorn trees and footings (Item 6a); house footings (Item 6b); bricks (Item 6c); footings of associated structures (Item 6d); sandstone footings Item 6e); salt glazed drainage pipes (Item 6f); shaft/well (Item 6g); water tank, combine box and fence line remains (Item 6h); <i>in situ</i> wall (Item 6i); borehole (Item 6j); scatter of ceramic and glass (Item 6k); fence line remains (6l). Within approved mining area (destroyed).
7a to 7i	Ruins of Marali Homestead	House ruins (Item 7a); a telegraph pole (Item 7b); wooden bridge across Swamp Creek (Item 7c); footbridge remains (Item 7d); shed (Item 7e); yards associated with shed (Item 7f); yards in paddock (Item 7g); water tank (Item 7h); well, trough and yards (Item 7h and 7i).
8a to 8c	Ruins of Hillview Homestead	House ruins (Item 8a); sheds (Items 8b to 8c). Umwelt 2008: 5.3 states that these items have local historical and social significance as they meet the Heritage Council criteria (a), (d), (f), (g) although criterion (f) for being 'endangered'. These items are threatened in the immediate locality by mining

Item ID	Complex	Description
		developments but are not rare in the region. The ruins and associated sheds and yards demonstrate local vernacular construction (a shed associated with 8b has been destroyed).
9	Great Northern Road	Former road. Within approved mining area (destroyed).

5.4 Management of Vibration Impacts

Controls that will be implemented to manage the vibration impacts on the heritage items discussed in **Section 5.3**, are detailed in the MGO Blast Management Plan and include, but are not limited to:

- designing each blast to reduce vibration at the heritage items
- use of adequate stemming to maximise confinement of explosive charged
- utilising blast design software to limit the Maximum Instantaneous Charge
- provide for charge distributions suited to observed face burden
- evaluating new technology and alternative blasting methodologies via a continual improvement process.

The *MGO Blast Management Plan* also contains details of the monitoring that will be undertaken to assess compliance with the vibration criteria identified in the relevant development consent. Monitoring will occur in locations which are considered to be representative of sites that are subject to specific vibration limits. In the event that a potential exceedance of the vibration limits for the heritage items is recorded at a representative location, an investigation will be undertaken.

The Blast Impact Assessment of the Mt Owen Continued Operations Project (Enviro Strata Consulting 2014) undertook modelling to assess the potential impact of blasting based on the model specified for MGO conditions. Results from this assessment regarding indirect impacts to listed heritage items is shown in **Table 5-2**.

The German standard DIN 4150: Part 3 Effects of Vibration on Structures includes a building type 'Particularly Sensitive' which is assigned vibration limits of 3mm/s (at less than 10Hz), 3 to 8mm/s (at 10-50Hz) and 8 to 10mm/s (at 50-100Hz). Swiss Standard SN640 312:1978 also includes a 'Particularly Sensitive' structural type which is assigned vibration limits of 3mm/s (at 10 to 30Hz) and 3 to 5mm/s (at 30 to 60 Hz).

None of the listed items detailed in **Table 5-2** have a predicted ground vibration level that exceeds 3mm/s. As such, there are not expected to be any direct or indirect impacts to the listed items as part of the Mt Owen Continued Operations Project. As no impacts on these sites are proposed or predicted, no management measures are required in relation to these items as part of the Mt Owen Continued Operations.

Table 5-2 – Indirect impacts to listed heritage items

Site	Listing	Predicted range of maximum ground vibration mm/s
Ravensworth Homestead	Local	0.1-2.9
Former Chain of Ponds Inn	State	0.1 to 0.6
Middle Falbrook Bridge over Glennies Creek	State	0.1 to 1.3
Greylands and Outbuildings	Local	Less than 0.1 to 0.5
Ravensworth Public School (former)	Local	0.1 to 0.5
St. Clements Anglican Church	Local	Less than 0.1 to 0.9
Community Hall	Local	Less than 0.1 to 0.8

Site	Listing	Predicted range of maximum ground vibration mm/s
Camberwell Glennies Creek Underbridge	Local	0.1 to 0.9
Former Dulwich Homestead (Kangory Homestead)	Local	0.1 to 0.7

5.5 General Management Strategies

5.5.1 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 specialist consulted. If the specialist considers the material uncovered constitutes an archaeological 'relic' or a heritage item, the Heritage Council 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
- is of state or local heritage significance.

MGO will protect any exposed potential historical archaeological material or heritage sites/items by temporarily fencing the areas and ceasing work within a 20 metre radius immediately after the material is uncovered.

5.5.2 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):

- a) as soon as remains are exposed, work is to halt immediately to allow assessment and management; contact local police, BCD and the Heritage Council
- b) 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, historic or forensic)
- c) if the remains are identified as forensic the area is deemed as crime scene
- d) if the remains are identified as Aboriginal and not forensic, the site is to be secured and the BCD and all registered Aboriginal parties are to be notified in writing
- e) if the remains are non-Aboriginal (historical) remains and not forensic, the site is to be secured and the Heritage Council 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 Council, 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 *Guidelines for the Management of Human Skeletal Remains under the Heritage Act 1977* (NSW Heritage Office 1998) 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 HHMP Area will be developed, in consultation with a physical anthropologist, the Heritage Council, BCD 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, workplace health and 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
- re-interment and commemoration.

5.5.3 Worker Inductions

The MGO will ensure any workers on site receive suitable heritage inductions prior to carrying out any activities which may cause impacts to historic heritage.

The MGO introduced suitable heritage inductions during 2017. These inductions include:

- an overview of the MGO Environmental Management System
- an overview of heritage protection in NSW
- an overview of historic heritage at the MGO
- a competency assessment.

All suitable records associated with these inductions are retained by the MGO.

6 Reporting and Review

6.1 Internal Reporting

Blast monitoring results will be stored in the Environmental Monitoring Database and reviewed to assess whether there have been or are likely to have been any exceedances of the blast vibration criterion for each of the heritage items discussed in **Section 5.3**. If recorded 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.

6.2 External Reporting

6.2.1 Annual Review

Compliance with the requirements of the development consents (including implementation of this HHMP) will be reported in the Annual Review submitted to the Secretary of DPI&E.

6.2.2 Incident Reporting

Any breach of performance measures or recorded exceedance of vibration criteria at a heritage item identified in **Section 5.3** will be managed through the protocols set out in the Blast Management Plan.

6.3 HHMP Review

This HHMP will be reviewed in accordance with the MGO *Environmental Management Strategy*, that is within three months of:

- the submission of the Annual Review
- the submission of an Incident Report to DPI&E
- the submission of an Independent Environmental Audit
- modification to the conditions of development consent.

If the review leads to revisions to the HHMP, the revised document will be submitted to DPI&E for approval within four weeks of the review.

7 Commitments

All commitments outlined within this Plan are detailed in **Table 7-1**. Management commitments requiring actioning were entered and have been actioned in the MGO Compliance Management system (CMO). Records of documentation associated with the management commitments is maintained within CMO.

Table 7-1 – Management Plan Commitments

No.	Commitment	Status
1	Plan to be prepared in consultation with the Heritage Division and Singleton Council	<i>Completed</i>
2	Archaeological investigation at Ravensworth Village prior to works commencing for the Hebden Road upgrade works	<i>Completed</i>
3	Possible archaeological investigation adjacent to Ravensworth Public School prior to works commencing for the Hebden Road upgrade works	<i>Completed</i>
4	Site 7g will be identified in the field by fencing and signage to ensure it is not disturbed by Glendell Mine Modification 3 activities	<i>Completed</i>
5	The shed associated with Site 8b will be manually dismantled and removed from the site.	<i>Completed</i>
6	Install protective fencing and signage at: a) Former Hebden Public School Site; b) John Winter Memorial site; c) Wooden bridge across Swamp Creek (Site 1); d) Unidentified Potential Dairy Site (Site 4 Items 4a to 4d); e) Remains of corduroy road (Item 5); f) Ruins of the former Marali homestead (Site 7 Items 7a to 7i); and g) Ruins of the former Hillview homestead (Site 8a to 8c).	<i>Completed</i>
7	Install signage to identify the presence of a heritage site at: a) MOH5	<i>Completed</i>
8	Sites to be recorded on the MGO GIS but not requiring further management: a) MOH8; b) MOH9; c) MOH10; and d) MOH12.	<i>Completed</i>
9	Introduce suitable heritage inductions in 2017	<i>Completed</i>

8 Accountabilities

Table 8-1 outlines the accountabilities associated with this HHMP.

Table 8-1 – Accountabilities

Role	Accountabilities for this document
Operations Manager	<p>Approve the HHMP.</p> <p>Provide adequate resources for the implementation of the HHMP.</p>
Environment and Community Manager	<p>Coordinate the day to day implementation of the HHMP, including the implementation of all management activities.</p> <p>Analyse and documentation for inclusion in the Annual Review.</p> <p>Undertake internal and external reporting requirements.</p> <p>Maintain relevant records on site.</p> <p>Periodically review progress against targets and performance indicators.</p> <p>Contact qualified archaeologist/heritage consultant and Heritage Council, BCD as appropriate, should previously unknown historical archaeological material/heritage sites/items be uncovered or identified.</p> <p>Contact all appropriate stakeholders in the event that human skeletal material is exposed during works.</p>
Environment and Community Coordinator / Officer	<p>Assist the Environment and Community Manager as required in implementation of the HHMP.</p>
Other MGO Staff and Contractors	<p>Comply with the management requirements and commitments contained within the HHMP.</p> <p>Report all non-compliances with this plan in accordance with MGO reporting procedures.</p>

9 Document Information

9.1 Relevant Legislation

The following legislation is relevant to this HHMP:

- a) *Environmental Planning and Assessment Act 1979*
- b) *Heritage Act 1977*
- c) *Public Health Act 1991*

9.2 Related Documents

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

Table 9-1 – Related documents

Title
GCAA
Ground Disturbance Permit
Mount Owen
Environmental Management Strategy
Aboriginal Cultural Heritage Management Plan
Blast Management Plan
Ground Disturbance Permit Process Presentation
Ground Disturbance Permit Process for Task Coordinators Competency

9.3 Reference Information

Reference information, listed in **Table 9-2**, is information that is directly related to the development of this document or referenced from within this document.

Table 9-2 – Reference information

Reference	Title
Enviro Strata Consulting Pty Ltd 2014	<i>Blast Impact Assessment of the Mount Owen Continued Operations Project on the Adjacent Community, Infrastructure and Underground Mine.</i>
Enviro Strata Consulting Pty Ltd 2014b	<i>Vibration Limits for Former Hebden School and John Winter's Memorial Site.</i>
NPWS 1997	<i>Aboriginal Cultural Heritage Standards and Guidelines Kit</i>
NSW Department of Health 2008	<i>Exhumation of Human Remains</i>
NSW Heritage Office 1998	<i>Skeletal Remains – Guidelines for the Management of Human Skeletal Remains under the Heritage Act 1977</i>
OEH 2006	<i>Photographic Recording of Heritage Items Using Film or Digital Capture</i>
OzArk 2017	<i>Historic Heritage Salvage Report. Ravensworth Village Site</i>

Reference	Title
Umwelt 2006a	<i>Historical Archaeology of Ravensworth East Mine, near Singleton, NSW: Excavation and Recording of Sites RE31, RE32 and RE33.</i>
Umwelt 2006b	<i>Historical Archaeology: Archival Recording and Excavation, Mt Owen Operations, Singleton, NSW.</i>
Umwelt 2007	<i>Historical Heritage Assessment for the Modification of Glendell Mine Operations</i>
Umwelt 2008	<i>Archival Recording of Heritage Items, Glendell Mine</i>
Umwelt 2014	<i>Historic Heritage Assessment - Mount Owen Continued Operations Project.</i>
Umwelt 2015	<i>Mount Owen Continued Operations Project Environmental Impact Statement</i>

9.4 Change Information

A summary of the document history is provided in **Table 9-3**.

Table 9-3 – Change information

Document Number	Version	Date	Description	Author/Owner	DPE Approval
XMO SD PLN 0064	1	February 2017	First plan for SSD 5850	OzArk EHM, Mt Owen EMS Committee	14/03/2017
XMO SD PLN 0064	2	October 2017	MOH13 has been added to the HHMP as a requirement of the 2017 Integra to Mount Owen Complex Water Pipeline Modification 1 Environmental Assessment (Hansen Bailey, 2017).	E&C Manager	17/10/2017
XMO SD PLN 0064	3	May 2018	Minor updated to take into account the archaeological investigations at Ravensworth Village in 2017 and the completion of works associated with Glendell Modification 3.	OzArk EHM, E&C Manager	17/10/2017
	4	December 2019	Administration Review and Revision following approval of SSD-5850 (MOD 2)	OzArk EHM, E&C Manager	TBC

Appendix A - Historic Heritage Management Plan Approval

To be inserted once approved by the Department.

Appendix B - DP&E receipt of Umwelt 2008



NSW GOVERNMENT
Department of Planning

Barbara Crossley
Director
Umwelt (Australia) Pty Limited
PO BOX 838
TORONTO NSW 2283

15 August 2008

Contact: Phil Jones
Phone: (02) 9228 6442
Fax: (02) 9228 6466
Email: phil.jones@planning.nsw.gov.au
Our ref: S03/00049

RECEIVED

21 AUG 2008

Dear Barbara

**Glendell Coal Mine (DA80/952)
Archival Record of Heritage Items**

Thank you for forwarding the Archival Record of Heritage Items as required under Condition 45, Schedule 3 of the Glendell Coal Mine development consent (as amended).

The Heritage Branch and Major Development Assessment Branch of the Department have reviewed the content, format and presentation of the document and are satisfied that it has been prepared in accordance with the terms of the condition.

If you have any queries, please contact Phil Jones on (02) 9228 6442.

Yours sincerely

Howard Reed 15-8-08
A/Manager
Mining and Extractive Industries
As delegate for the Director-General