

Appendix G

Statement of heritage impact assessment

M1 Mount Ousley Road Climbing Lanes

Statement of Heritage Impacts

Report to Roads and Maritime
Services

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EXECUTIVE SUMMARY

Roads and Maritime Services (Roads and Maritime) is proposing to increase the number of climbing lanes and alter the road alignment of the M1 Princes Motorway (formerly Mount Ousley Road) at Mount Ousley. The project area is located in the Wollongong Local Government Area, 60 km south of Sydney and seven kilometres northwest of Wollongong City.

Three design proposals with several road alignment options have been proposed. This report focuses on the most recent design proposal, designated by Roads and Maritime as the 'climbing lanes scope change' (the proposal).

The proposal involves road widening, grading and re-aligning along the segment of the M1 Princes Motorway between the Picton Road interchange and Bulli Tops. The proposal has been divided into two stages. Stage one proposes to add two climbing lanes (for a total of three lanes in each direction) to the Motorway between the Picton Road interchange and Bellambi Creek. Stage two proposes to add two climbing lanes (for a total of three lanes in each direction) to the Motorway between Bellambi Creek and Bulli Tops. The proposal also includes the construction of stockpile yards and amenity access points.

Artefact Heritage has been engaged by Roads and Maritime to prepare a Statement of Heritage Impact (SoHI), including a non-Aboriginal archaeological assessment, for the proposal. This report will form part of the review of environmental factors (REF) in preparation by Roads and Maritime in accordance with the requirements of Part 5 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).

This report assesses and documents potential impacts of the proposal on non-Aboriginal heritage values.

Overview of findings

- There are four listed heritage items located within the proposal area. These are:
 - The Old Mountain Road (Wollongong LEP 2009)
 - Rixons Pass Road (Wollongong LEP 2009)
 - The site of the former 'Biddulph farm' (Wollongong LEP 2009)
 - The Illawarra Escarpment Landscape Area (Wollongong LEP 2009 and Wollongong DCP 2009).
- There is also one listed heritage item located within 50 m of the proposal area. This is:
 - The Bellambi Creek Dam (Illawarra Regional Environment Plan 1986).
- There is one unlisted item of potential local heritage significance within proposal area – Mount Ousley Road former alignments. There are two particular items of significance associated with the former alignments. These are:
 - A sandstone culvert and sandstone retaining wall, associated with the embankment built during construction of Mount Ousley Road in the early 1940s.
 - A chiselled sandstone drain, associated with water drainage management during construction of Mount Ousley Road in the early 1940s.

- There are no identified areas with the potential to contain subsurface archaeological remains within the proposal area.

Recommendations

- Archival recording would be undertaken prior to the commencement of works for two heritage items associated with the construction of Mount Ousley Road. One copy of the archival recording should be submitted to RMS. These items are:
 - The sandstone culvert and associated sandstone retaining wall
 - The chiselled sandstone drain
- Wollongong City Council would be consulted in regard to potentially reducing the curtilages of the four heritage listed items located within the study area
- Recommendations made by the visual impact assessment in relation to the Illawarra Escarpment Landscape Area would be followed in order to mitigate visual impacts to the item.
- If unexpected archaeological finds are discovered during the proposed works, the Roads and Maritime Standard Management Procedure for Unexpected Heritage Items (2015) would be followed. The NSW Heritage Division would be notified of the discovery of a relic in accordance with Section 146 of the NSW *Heritage Act 1977*
- A heritage induction would be provided to workers before construction begins informing them of the location of heritage items, and guidelines to follow if unexpected heritage items or deposits are located during works.

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1.0 INTRODUCTION AND BACKGROUND

1.1 Introduction

Roads and Maritime Services (Roads and Maritime) is proposing to increase the number of climbing lanes and alter the road alignment of the M1 Princes Motorway (formerly Mount Ousley Road) at Mount Ousley (proposal). The proposal area is located in the Wollongong Local Government Area (LGA), 60 km south of Sydney and seven kilometres northwest of Wollongong City.

The proposal involves road widening, grading and re-aligning along the segment of the M1 Princes Motorway between the Picton Road interchange and Bulli Tops.

Artefact Heritage has been engaged by Roads and Maritime to prepare a Statement of Heritage Impact (SoHI), including a preliminary non-Aboriginal archaeological assessment for the proposal. This report forms part of the review of environmental factors (REF) in preparation by Roads and Maritime in accordance with the requirements of Part 5 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).

This report assesses and documents potential non-Aboriginal heritage impacts of the proposal.

1.2 Study area

The proposal area comprises approximately 7.5 km of the M1 Princes Highway (formerly Mount Ousley Road). The proposal area extends from the intersection of Picton Road and the M1 Princes Motorway in the south, with its northern boundary at Bulli Tops, 400m south of the intersection of the Mount Ousley Road and the Princes Highway at Bulli Pass. Proposed new road alignments extend into adjacent areas of bushland on either side of the M1 Princes Motorway.

The study area aligns with the proposal area, with 50m buffer incorporating adjacent areas of surrounding road shoulders, cleared land and vegetated bushland. Proposed stockpile and works yards were also included in the study area.

The study area is outlined in Figure 1 and Figure 2 below.

1.3 The Proposal

Roads and Maritime have proposed to upgrade the section of the M1 Princes Motorway between Picton Road and Bulli Tops in order to improve traffic capacity and road safety. Three design proposals with several road alignment options have been proposed. This report focuses on the most recent design proposal, designated by Roads and Maritime as the 'climbing lanes scope change'.

This design proposal is separated into two stages of works. Stage one is located in the southern extent of the proposal area, where the present M1 Princes Motorway would be upgraded from the intersection of Picton Road to Bellambi Creek in the north.

Features of stage one include:

- Increasing the number of continuous lanes from four to six (three in each direction)
- Realigning the M1 Princes Motorway to improve minimum curve radii from a low of 253m to between 300m and 460m
- Retaining the present straight section of road over Cataract Creek

- Developing new 'offline' road alignments through areas to the east of the present M1 Princes Motorway, in particular:
 - A 950m extent of road to replace the present alignment between the Picton Road interchange and Cataract Creek
 - A 1,250m extent of road to replace the present alignment between Cataract Creek and Bellambi Creek
- Generally improving road grades and horizontal alignment.

Stage two of this design proposal is located in the northern extent of the M1 Princes Motorway Corridor, extending from Bellambi Creek in the south to Bulli Tops in the north.

Features of stage two include:

- Increasing the number of continuous lanes from four to six (three in each direction)
- Retaining the present alignment of the road corridor with the exception of one new 'offline' road alignment:
 - A 650m extent of road to replace the present alignment between Woonona Mountain and the Princes Highway interchange at Bulli Tops
- Generally improving road grades and horizontal alignment.

In addition, proposed stockpile and works yards are included in the proposal area. Disused road alignments of the original Mount Ousley Road are also likely to be employed for vehicle access during the construction process.

It is expected that physical impacts in the proposal area will be considerable, with sandstone cutting, earth excavation and the deposition of fill to create embankments required to redevelop the horizontal topography for the new climbing lanes. Vegetation clearance and the construction of works sites will also cause a significant physical impact.

1.4 Scope of this assessment

The purpose of this SoHI is to assess potential impacts to non-Aboriginal heritage values as a result of the proposal. The SoHI will inform the REF for the project.

The scope of assessment includes:

- An overview of the historical development of the study area
- Identification of listed and unlisted heritage items and potential archaeological remains within the study area
- A site inspection
- Assessment of significance for heritage items and potential archaeological remains within the study area
- Recommendations on appropriate management and mitigation measures in line with statutory requirements.

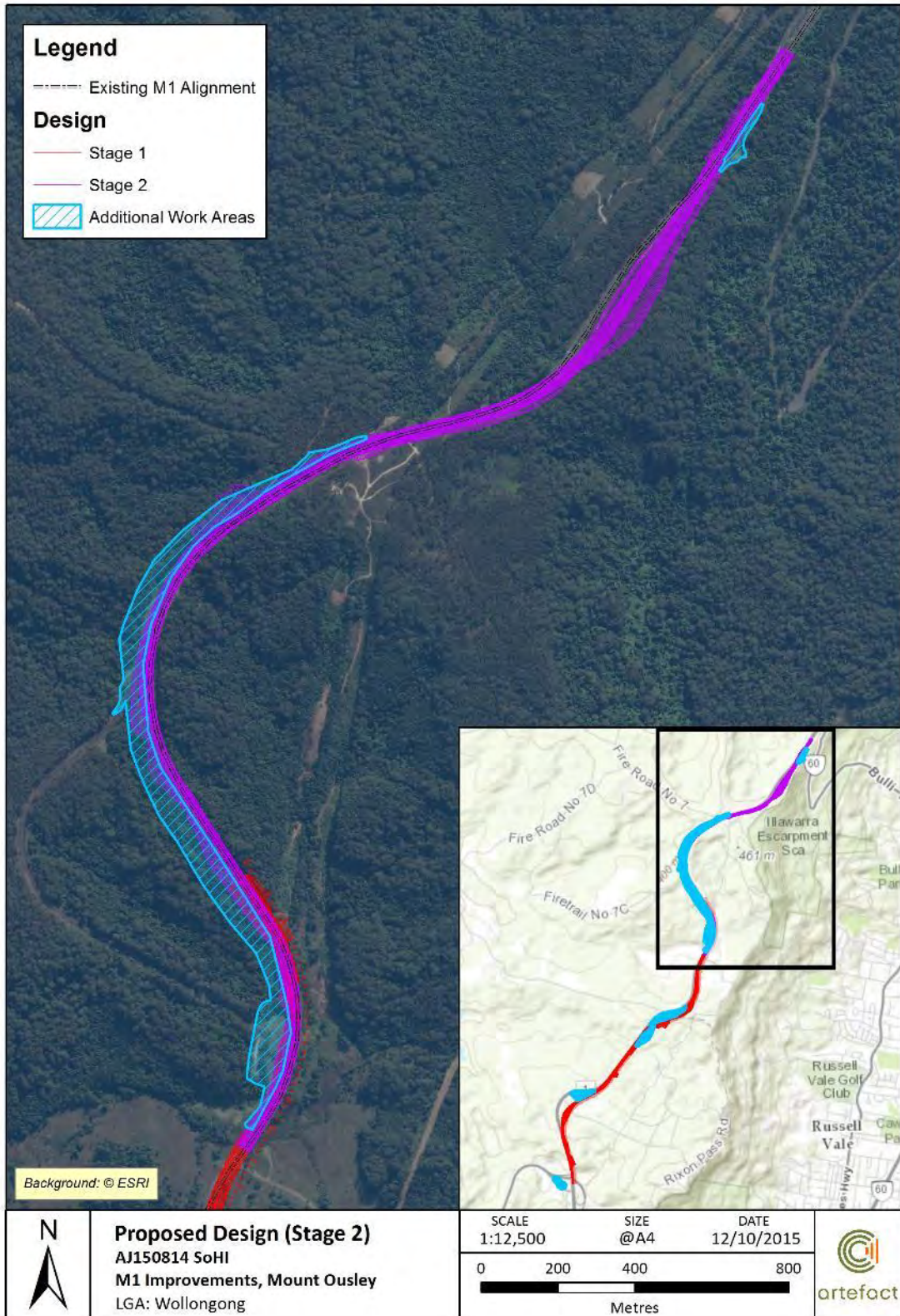
1.5 Report authorship and acknowledgements

Duncan Jones, Heritage Consultant for Artefact Heritage, prepared this report with management input from Josh Symons (Senior Archaeologist). Principal Archaeologist Dr Sandra Wallace provided management input and reviewed the report. Duncan Jones and Heritage Consultant Alex Timms attended the site inspection.

Figure 1: Location and design of M1 upgrade project – stage 1



Figure 2: Location and design of M1 upgrade project – stage 2



2.0 LEGISLATIVE CONTEXT

2.1 Introduction

There are several items of NSW State legislation that are relevant to the current study. A summary of these Acts and the potential legislative implications for the proposed development follow.

2.2 *Heritage Act 1977*

The NSW *Heritage Act 1977* (Heritage Act) is the primary item of State legislation affording protection to items of environmental heritage in NSW. The Heritage Act is designed to protect both listed heritage items, such as standing structures, and potential archaeological remains or relics. Under the Heritage Act, 'items of environmental heritage' include places, buildings, works, relics, moveable objects and precincts identified as significant based on historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic values. State significant items are listed on the NSW State Heritage Register (SHR) and are given automatic protection under the Heritage Act against any activities that may damage or affect its heritage significance.

State Heritage Register

The State Heritage Register (SHR) was established under Section 22 of the Heritage Act and is a list of places and objects of particular importance to the people of NSW, including archaeological sites. The SHR is administered by the Heritage Division of the Office of Environment and Heritage (OEH). This includes a diverse range of over 1500 items, in both private and public ownership. To be listed, an item must be deemed to be of heritage significance for the whole of NSW.

There are no items listed on the SHR located within the study area.

Section 170 Registers

Under the Heritage Act all government agencies are required to identify, conserve and manage heritage items in their ownership or control. Section 170 requires all government agencies to maintain a Heritage and Conservation Register that lists all heritage assets and an assessment of the significance of each asset. They must ensure that all items inscribed on its list are maintained with due diligence in accordance with State Owned Heritage Management Principles approved by the Government on advice of the NSW Heritage Council. These principles serve to protect and conserve the heritage significance of items and are based on NSW heritage legislation and guidelines.

There are no items listed on the s170 registers of relevant government agencies within the study area.

Archaeological relics

Part 6 Division 9 of the Heritage Act protects archaeological 'relics' from being exposed, moved, damaged or destroyed. This protection extends to situations where a person has reasonable cause to suspect that archaeological remains may be affected by the disturbance or excavation of the land. It applies to all land in NSW that is not included in the SHR. Section 4(1) of the Heritage Act (as amended 2009) defines 'relic' as follows:

"relic means any deposit, artefact, object or material evidence that:

(a) relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and

(b) is of State or local heritage significance.”

Sections 139-145 of the Heritage Act prevent the excavation or disturbance of land known or likely to contain relics, unless in accordance with an excavation permit. Excavation permits are issued under Section 140 of the Heritage Act, or Section 60 for sites listed on the SHR. Excavation Permit Applications must be supported by an Archaeological Research Design. Section 146 of the Heritage Act requires that any discovery or location of a ‘relic’ is reported to the Heritage Council.

If the proposed works are minor and would have minimal impact on the heritage significance of the place or site, they may be granted an exception or exemption under Section 139 (4) of the Heritage Act.

Section 146 of the Heritage Act requires any person who is aware or believes that they have discovered or located a relic must notify the Heritage Council of NSW providing details of the location and other information required.

Works

The Heritage Act identified ‘works’ as being in a separate category to archaeological ‘relics.’ ‘Works’ refer to past evidence of infrastructure. ‘Works’ may be buried, and therefore archaeological in nature, however, exposure of a ‘work’ does not trigger reporting obligations under the Heritage Act. ‘Works’, as items of environmental heritage, have the potential to provide information that contributes to our knowledge of past practices, and good environmental practice recognises this. Roads and Maritime, for example, uses its Standard Management Procedure: Unexpected Heritage Items (Roads and Maritime 2015) to manage the discovery of such items.

2.3 *Environmental Planning and Assessment Act 1979*

The *Environmental Planning and Assessment Act 1979* (EP&A Act) establishes the framework for cultural heritage values to be formally assessed in the land use planning and development consent process. The EP&A Act requires that environmental impacts are considered prior to land development; this includes impacts on cultural heritage items and places as well as archaeological sites and deposits. The EP&A Act requires that Local Governments prepare planning instruments (such as Local Environmental Plans [LEPs] and Development Control Plans [DCPs]) in accordance with the Act to provide guidance on the level of environmental assessment required. The current proposal site boundary falls within the boundary of the Wollongong City LGA and is subject to the Wollongong 2009 LEP. This includes a schedule of local heritage items and planning controls related to development in the vicinity of heritage items. In addition, one significant item in the study area, the Illawarra Escarpment Landscape Area, is given explicit treatment in the Wollongong City Council Development Control Plan.

Wollongong City Council LEP 2009

The study area falls within the Wollongong LEP. The Wollongong LEP aims to conserve the heritage significance of heritage items and heritage conservation areas, including associated fabric, settings and views; and to protect archaeological sites. The LEP stipulates development controls in relation to development proposed on or near heritage listed properties, archaeological sites, or Aboriginal places of heritage significance.

There are four heritage items listed in the Wollongong LEP that are located within the study area. These are summarised in Table 1 below.

Table 1: Heritage items within the study area listed on the Wollongong LEP 2009

LEP designation	Name	Location	Significance
6517	Old Mountain Road	North of Rixons Pass Road, Bulli	Local
6518	Rixons Pass Road	Rixons Pass, Woonona	Local
61064	Biddulph Farm	Mount Ousley intersection with Rixons Pass Road, Cataract	Local
Marked with a green outline and green vertical hatch	Illawarra Escarpment Landscape Area	Illawarra Escarpment	Local

Illawarra Regional Environment Plan 1986

The study area is located within an area provisioned under a Regional Environment Plan for the Illawarra area. Near to the study area, one item has been listed to be of 'Environmental Heritage' on the REP 1986.

Table 2: Environmental Heritage Objects listed on the Illawarra REP 1986

Item	Location	Associated With	Significance
Bellambi Creek Dam or Charlesworth's Dam	Bellambi Creek, west of the Bellambi Creek Bridge on Mount Ousley Road	South Bulli Colliery, Russell Vale	Local

Wollongong City Council Development Control Plans 2009

The study area contains one significant item listed in the Wollongong City Council DCP, the Illawarra Escarpment Landscape Area. It should be noted that the boundary demarcation for the Illawarra Escarpment Landscape Area as a listed heritage conservation zone in the Wollongong LEP, and as a special conservation area in the Wollongong City Council DCP, are different (see Figure 14 for LEP boundaries and Figure 3 for DCP boundaries below). The study area partially coincides with the Illawarra Escarpment Landscape Area under both boundary definitions.

Chapter B6 of the Wollongong City Council DCP 2009 specifically outlines requirements for development in the Illawarra Escarpment Landscape Area. Requirements in relation to heritage are:

- If the subject site contains an item of environmental heritage or is within a heritage conservation area, a heritage impact assessment report will be required to accompany any Development Application for subdivision or development upon the subject site
- The preparation of the heritage impact assessment report must be carried out in accordance with the requirements of the Heritage Chapter in Part E of the DCP.

Figure 3: Illawarra Escarpment Landscape Area boundaries in Wollongong City Council DCP (study area in blue)



2.4 Environmental Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides a legislative framework for the protection and management of matters of national environmental significance, that is, flora, fauna, ecological communities and heritage places of national and international importance. Heritage items are protected through their inscription on the World Heritage List, Commonwealth Heritage List or the National Heritage List.

The EPBC Act stipulates that a person who has proposed an action that will, or is likely to, have a significant impact on a World, National or Commonwealth Heritage site must refer the action to the Minister for Environment and Energy (hereafter Minister). The Minister will then determine if the action requires approval under the EPBC Act. If approval is required, an environmental assessment would need to be prepared. The Minister would approve or decline the action based on this assessment.

A significant impact is defined as “an impact which is important, notable, or of consequence, having regard to its context or intensity.” The significance of the action is based on the sensitivity, value and quality of the environment that is to be impacted, and the duration, magnitude and geographic extent of the impact. If the action is to be undertaken in accordance with an accredited management plan, approval is not needed and the matter not need be referred to the Minister.

Commonwealth Heritage List

The Commonwealth Heritage List has been established to list heritage places that are either entirely within a Commonwealth area, or outside the Australian jurisdiction and owned or leased by the Commonwealth or a Commonwealth Authority. The Commonwealth Heritage List includes natural, Indigenous and historic heritage places which the Minister for Sustainability, Environment, Water, Population and Communities is satisfied have one or more Commonwealth Heritage values.

No sites within or near the proposal site boundary are included on the Commonwealth Heritage List.

National Heritage List

The National Heritage List has been established to list places of outstanding heritage significance to Australia. It includes natural, historic and Indigenous places that are of outstanding national heritage value to the Australian nation.

No sites within or near the study area are included on the National Heritage List.

2.5 State Environmental Planning Policy (Infrastructure) [ISEPP] 2007

State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) aims to facilitate the effective delivery of infrastructure across the State. ISEPP clarifies the consent arrangements for certain infrastructure projects.

Clause 94(1) of ISEPP permits development for the purpose of a road or road infrastructure facilities to be carried out, by or on behalf of a public authority, without consent on any land (except for land reserved under the *National Parks and Wildlife Act 1974* where it can only be carried out if it meets certain requirements).

As the proposal meets the definitions of 'road infrastructure facilities' provided for by clauses 93 and 94(2), and is being carried out by Roads and Maritime, it is permissible without consent under ISEPP. As a result, it can be assessed under Part 5 of the EP&A Act. Development consent from Wollongong City Council is not required. Part 2 of the ISEPP contains provisions for public authorities to consult with local councils and other public authorities before the commencement of certain types of development.

3.0 HISTORICAL CONTEXT

3.1 Aboriginal histories in the Illawarra region

Aboriginal people traditionally lived in small family or clan groups that were associated with particular territories or places. The study area is located within the Dharawal language group area (Attenbrow 2010: 34). The Dharawal language group was largely coastal and is thought to have extended from the Shoalhaven River in the south, to Botany Bay in the north and then inland to Camden (Attenbrow 2010: 34). The Dharawal language group was bordered to the north in the Botany Bay – southern Sydney region by the Darug and to the west in the Mittagong – Moss Vale region by the Gundungurra.

Long-term areas of interaction and ‘travel corridors’ for movement between different language groups may have existed where there were shared boundaries. Laila Haglund has suggested that the Campbelltown area in south-west Sydney may have represented the intersection between the boundaries of the Dharawal, Darug and Gundungurra, and that the Narellan Valley may have been part of a ‘travel corridor’ facilitating movement between north-western Sydney and the Illawarra (JMcD CHM 2007: 21).

Several of the early British settlers in the Illawarra recorded large gatherings of Aboriginal people, including a reference by Navin (1994: 8) that Robert James, a local resident of the area, recorded a camp of around 100 Aboriginal people on the banks of American Creek at Mount Kembla. In 1836 a group of around 200 Aboriginal people were observed in the Illawarra area as they were preparing to travel to Cowpastures in south-west Sydney (AMBS 2010: 33).

3.2 Early colonial history and land grants

Early observations of the Illawarra region by the British included observations made during Captain Cook’s voyage along the east coast of Australia in 1770, and by early explorers through the region, such as George William Evans (Organ 1993: 49). Organ (1993: 49) documents an anonymous exploration journal attributed to surveyor George William Evans, which documented an overland expedition north from Jervis Bay via Wollongong in 1812. The exploration party encountered several groups of Aboriginal people, and at one point exchanged some of their possessions with one of the groups for oysters (Organ 1993: 49).

The earliest British settlement of the Illawarra region was part of a southwards movement from Sydney by pastoralists searching for grazing land. One of the first people to move their cattle beyond the Nepean River in the cow pastures area of south-west Sydney was Charles Throsby. Around 1815, Throsby had moved cattle to the Wollongong area (Barwick 1978: 2) and by 1819 had established a pastoral property in the vicinity of the Wingecarribee River in the southern highlands. Throsby did not reside in the area, instead leaving stockman in charge of the cattle (Barwick-Hooke 1988: 8).

The establishment of new areas of grazing land allowed Governor Macquarie to fulfil land grant promises made to free settlers arriving in the colony (Barwick-Hooke 1988: 8). The first five land grants in the Illawarra were organised by John Oxley, the Surveyor-General of the colony, in November 1816 (Barwick 1978: 2). Oxley advertised in the Sydney Gazette on 16 November 1816 for any person who had obtained a promise of land in the Illawarra area to meet at the hut of Throsby’s stockman on 2 December 1816 (Sydney Gazette 16/11/1816).

Many of the early land grants in the region were awarded as large allotments to pastoralists who were given use of convict labourers to help clear vegetation from their newly acquired properties. With the decline in convict transportation and the increase in free settlers from the 1840s onwards, smaller

allotments of land were divided out to new immigrants. However, the thickly vegetated and precipitous Illawarra escarpment was only slowly taken up by new settlers, with small allotments being granted along the escarpment in the study area only from the 1850s onwards (Kass 2010:21).

One such escarpment allotment was a 180 acre purchase from the Crown by Edmund Biddulph Henning in 1855. The history of this property has been well documented due to the residence of Rachel Biddulph Henning, who's collection of letters describing early colonial life were published in the 1950s. Edmund Henning built a house on the edge of the Illawarra escarpment and cleared some of his land for cattle pasturage (Henning 2014 [1963]).

In 1857 Edmund Henning sold his property to the landowner Henry Osborne, who was:

“... buying all the land he could about, with a view to the future value of the timber and the coal underneath. I realised all I had expended on the property.” (Henning 2014 [1963])

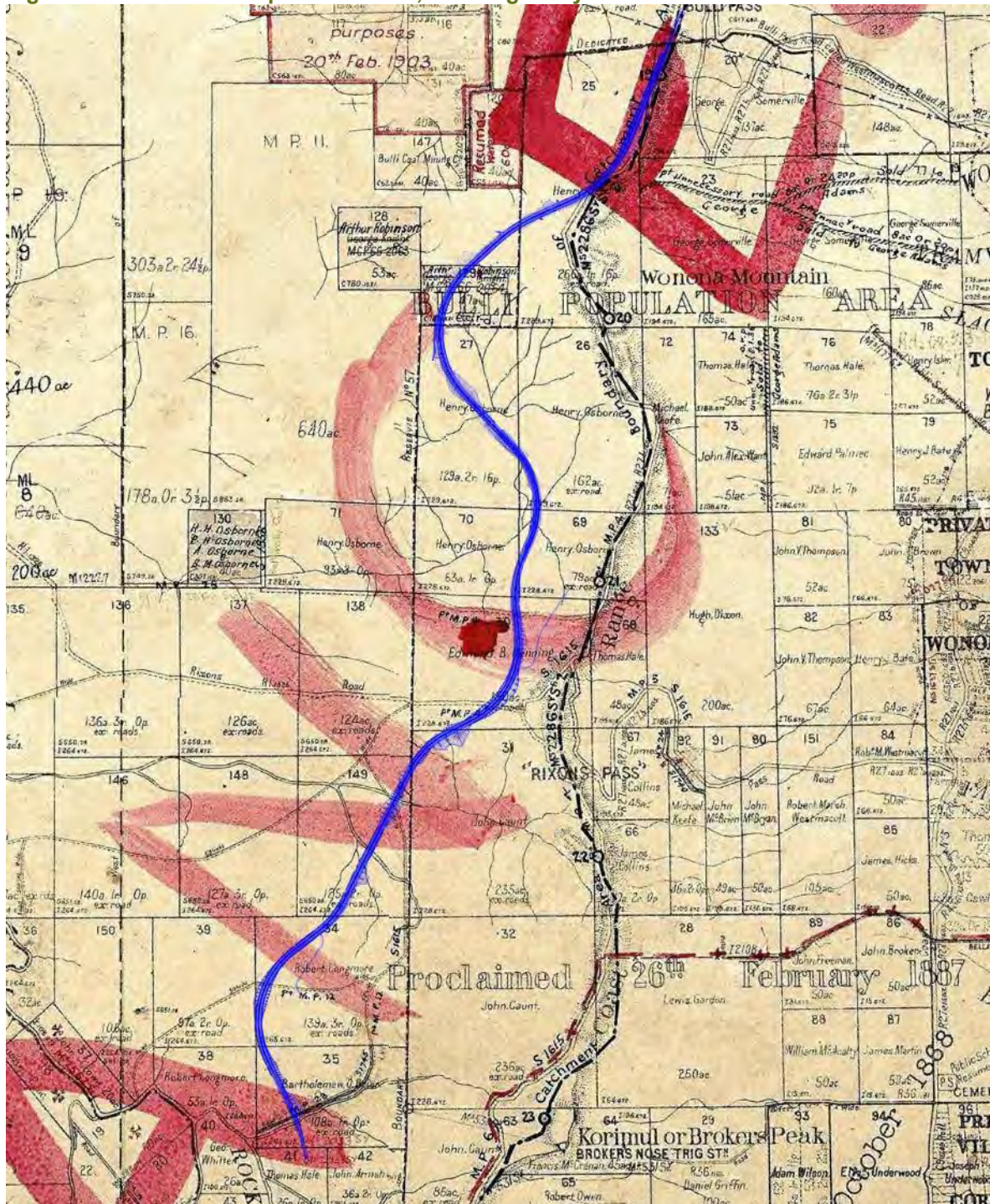
Henry Osborne was a wealthy pastoralist who throughout the 1830s and 1840s acquired large areas of land for dairying in both the Illawarra and Hunter regions. With the development of the coal industry in the Illawarra in the 1840s and 1850s, Osborne purchased large areas of land for the exploitation of coal, running the Osborne Wallsend Colliery in Bulli (later the Kemira Colliery). When he died in 1859 his descendants took over his property and coal mining ventures (King 1964: 9). By the end of the 19th century, almost all of the escarpment was owned or leased by individuals representing coal mining interests (see Figure 4 below).

3.3 The Illawarra coal industry

The first discovery of coal in the Illawarra region was made in 1797 by a shipwrecked crew of sailors as they were travelling overland to Sydney (Lindsay 1994: 10). Despite this and other early discoveries the coal industry in the Illawarra was not exploited until after 1848 when the coal mining monopoly in the Hunter Valley held by the Australian Agricultural Company was repealed (Kass 2010: 30). Within ten years several large yield coal mines were established along the edge of the Illawarra escarpment, where the Bulli and Mount Kiera coal seams were easiest to access (Kass 2010: 30 – 31).

While no collieries were established within the study area, several collieries were located on the Illawarra escarpment near to it. The Corrimal Colliery and the Bellambi and Woonona Coal Mines were located around 1.5 km to the east of the study area, on the lower slopes of the escarpment while the one of the Bulli Coal Mining Company mines was 250 m northwest of the study area on the escarpment. Several of these coal mines have horizontal shafts that lie at a significant depth underneath the study area (ERM 2009: 7).

Figure 4: 1898 Parish Map of Woonona, showing study area in blue



The Illawarra coal industry came to dominate the economy of the northern Illawarra region by the late 19th century (Kass 2010: 32). The need for large scale transport of coal supplies for export encouraged the development of tram and train lines from the lower slopes of the escarpment to the coastline and workers housing was built on the escarpment edge near the coal shafts themselves (Kass 2010: 31). With the acquisition of many of the Illawarra coal ventures throughout the 20th century by large mining conglomerates, combined with the use of car and truck transport for workers and coal hauling, the use of the escarpment for coal mining was substantially reduced by the 1970s and 1980s. Combined with environmental protection measures introduced during this time, the

number of coal mining ventures that operate directly on the Illawarra escarpment today have diminished (Kass 2010: 33).

3.4 The Nepean Water Scheme

The growth of Sydney in the mid-19th century necessitated a greater water supply capacity than that being utilised from the Botany Swamps. In 1869 a water supply commission recommended obtaining water from the upper tributaries of the Nepean River and the establishment of canals and aqueducts to channel this water into Sydney. These headwaters included the Cordeaux and Cataract Rivers which begin at their eastern watershed on the edge of the Illawarra Plateau (OEH 2008). In 1880 much of the western lee of the Illawarra escarpment was declared part of the Sydney water catchment and areas that had already been privately apportioned were reclaimed by the government.

While this water supply was critical for the development of infrastructure in Sydney, these water sources were also important in supplying water for the Illawarra region. While early settlement had utilised lagoons, private water tanks and wells, mining operations also employed large amounts of water. Bellambi Creek, a tributary of Cataract River, was partially dammed in the 1880s in order to supply water for the operation of the South Bulli Colliery (Kass 2010: 93).

The Nepean Water Scheme is still in use today as a major part of the Sydney water catchment. The Cataract and Cordeaux rivers were dammed in the early 20th century, and much of the study area within the upper tributary water catchment areas of these dams.

3.5 Tracks and roads over the Illawarra escarpment

The Illawarra escarpment rises very steeply on its eastern face and descends gradually on its western side. This steep ridgeline has acted as a serious impediment to animal and vehicle transport since European settlement of the region and several different paths and passes have been established to traverse it (Figure 5).

The first formal track onto the coastal plain was established by Charles Throsby when he ventured into the Illawarra in 1815 seeking pasturage for his cattle. Following the Illawarra ridgeline from the north, his original track descended the escarpment eastwards towards what would eventually become the township of Bulli. This descent was described as particularly difficult, and when Governor Macquarie used the track to visit the nascent Illawarra colony in 1822 he described it as:

“... very rugged, rocky and slippery, and so many obstacles opposed themselves to our progress, that it was with great difficulty that the pack-horses could get down this horrid steep descent. At length we effected it, but it took us an hour to descend altho’ the descent is only one mile and a half long.” (quoted in McDonald 1979: 13).

Because of the difficulty of this descent, other tracks and roads were soon opened up into the Illawarra as the volume of traffic in the region increased. Cornelius O’Brien, an early settler in the region, established his own toll road that descended the ridge north of Mount Kembla in 1821 (Kass 2010: 89). When Surveyor General of New South Wales Thomas Mitchell had the Illawarra surveyed in 1834 he commissioned the road to descend at Mount Keira which largely superseded both O’Brien’s and Throsby’s roads for traffic into the Illawarra (McDonald 1979: 6).

In 1848, mail carrier and early pioneer Benjamin Rixon established the pass which became known as Rixons Pass Road that ascended the ridgeline to the south of the Throsby’s Track. It was opened to wheeled vehicles in 1858, prior to which riding and carriage passengers would have to disembark in order to make the ascent (see Figure 6; Organ and Hardy 1984: 107 – 110). A further track was

established by Robert Westmacott in 1844 which was opened to wheeled vehicles in 1868. This route, with some alignment changes, has become the present Bulli Pass descent of the Princes Highway (Kass 2010: 89).

Because of war-time infrastructure pressures in the early 1940s, requiring the transferral of military personnel to and from south west Sydney, a new arterial road to access the Illawarra coastal plain was deemed necessary. In 1942 the Department of Main Roads completed this new road down the Illawarra escarpment, named Mount Ousley Road. This road linked the Princes Highway at Bulli Tops with the then existing portion of Mount Ousley Road, which terminated in the lower foothills of the Illawarra escarpment. This road has been subsequently upgraded from the 1960s until today to increase the volume of vehicle traffic and to improve safety on the route.

Figure 5: Map of early colonial roads in the northern Illawarra. Source: King 1965: 5.

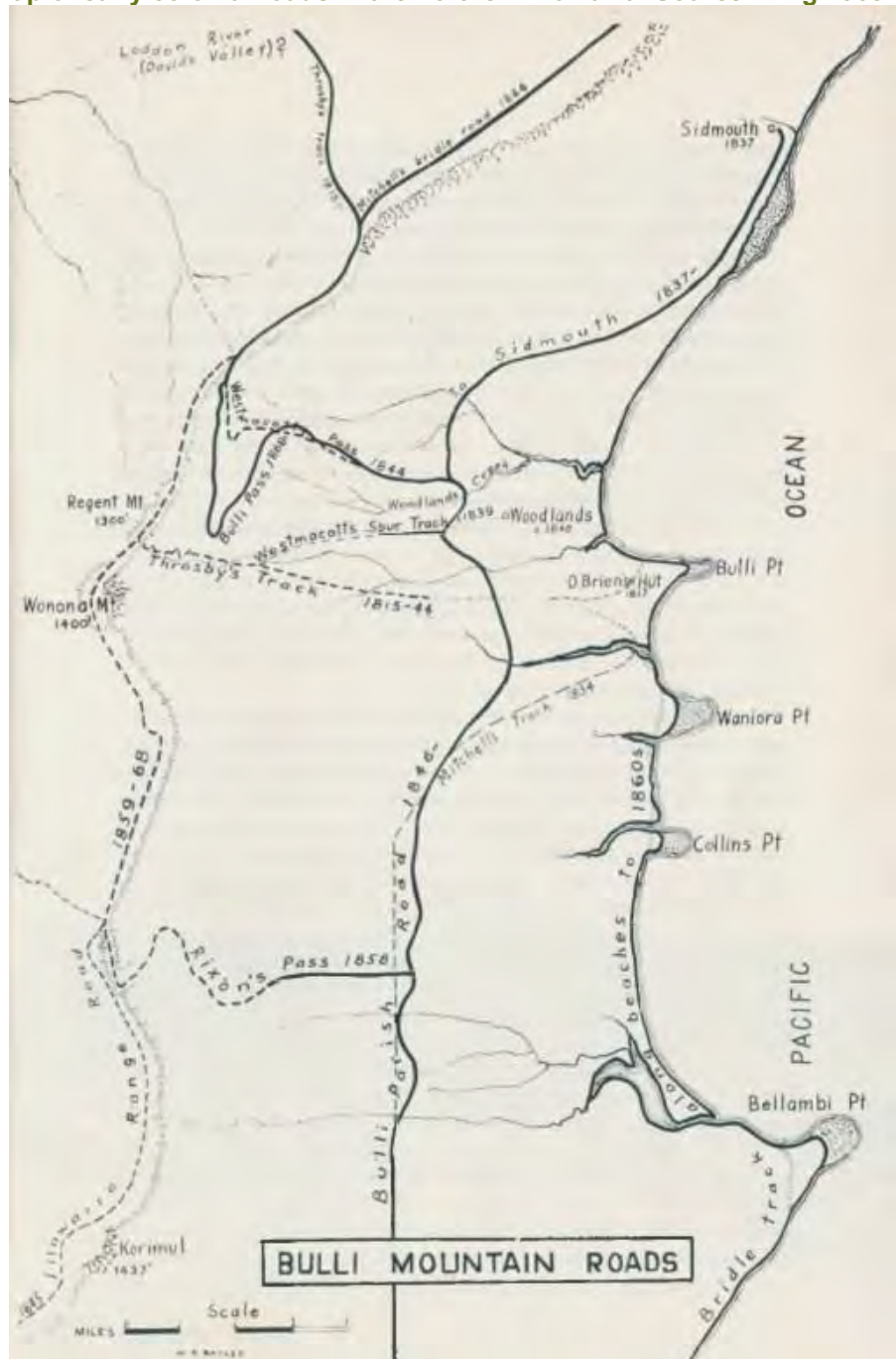


Figure 6: James Wills 1857 *"The Mountain Road at Woonona (Rixons Road)"*. Source: Josef Lebovic Gallery



4.0 RESULTS OF SITE INSPECTION

4.1 Background

A site inspection was conducted on the 8th and 10th of September 2015 by Alex Timms and Duncan Jones (Heritage Consultants) from Artefact Heritage. The aim of this inspection was to identify or assess any areas of archaeological potential, unlisted heritage items or heritage views and vistas within the study area. The inspection was undertaken on foot and a photographic record was made.

4.2 Site description

The study area consists of the proposal area for the M1 Princes Motorway climbing lanes upgrade, with an additional 50m buffer zone on either side of this proposed road corridor (see Figure 13 and Figure 14 for map of the study area). The majority of the study area is characterised by the topography of the Illawarra Escarpment with its thick vegetation (Figure 7) and steep hill slopes (Figure 8).

The southern half of the study area, corresponding with Stage one of the proposal area, is a steep sandstone hill slope at its southern extent (Figure 9), ascending onto the plateau and lowering briefly into the Cataract Creek and Bellambi Creek valleys before ascending again. The ridges between these creek valleys are largely thickly forested, with the valleys themselves partially cleared for farms, access roads and waterways (Figure 10). Disturbance in this area is predominately associated with the road construction, with large artificial embankments (Figure 11) and earth-moved windrows on either side of the M1 Princes Motorway.

The northern half of the study area, corresponding with Stage two of the proposal area, is within a steep slope ascending from the Bellambi Creek valley and then a gentler slope at the top of the Illawarra escarpment ridgeline at Woonona Mountain. The majority of this part of the study area is heavily vegetated. Vegetation has been cleared for electricity transmission easements (Figure 12), fire trails and vehicle access tracks.

Figure 7: Thick vegetation in study area, north aspect



Figure 8: Steep hill slope in study area, east aspect



Figure 9: Exposed sandstone at summit of steep hill slope in southern part of study area, west aspect



Figure 10: Open grassland near creek line, west aspect



Figure 11: Embankment on edge of M1 Princes Motorway, south aspect



Figure 12: Transmission line in northern part of study area, north aspect



Figure 13: Stage One study area with listed and unlisted heritage items

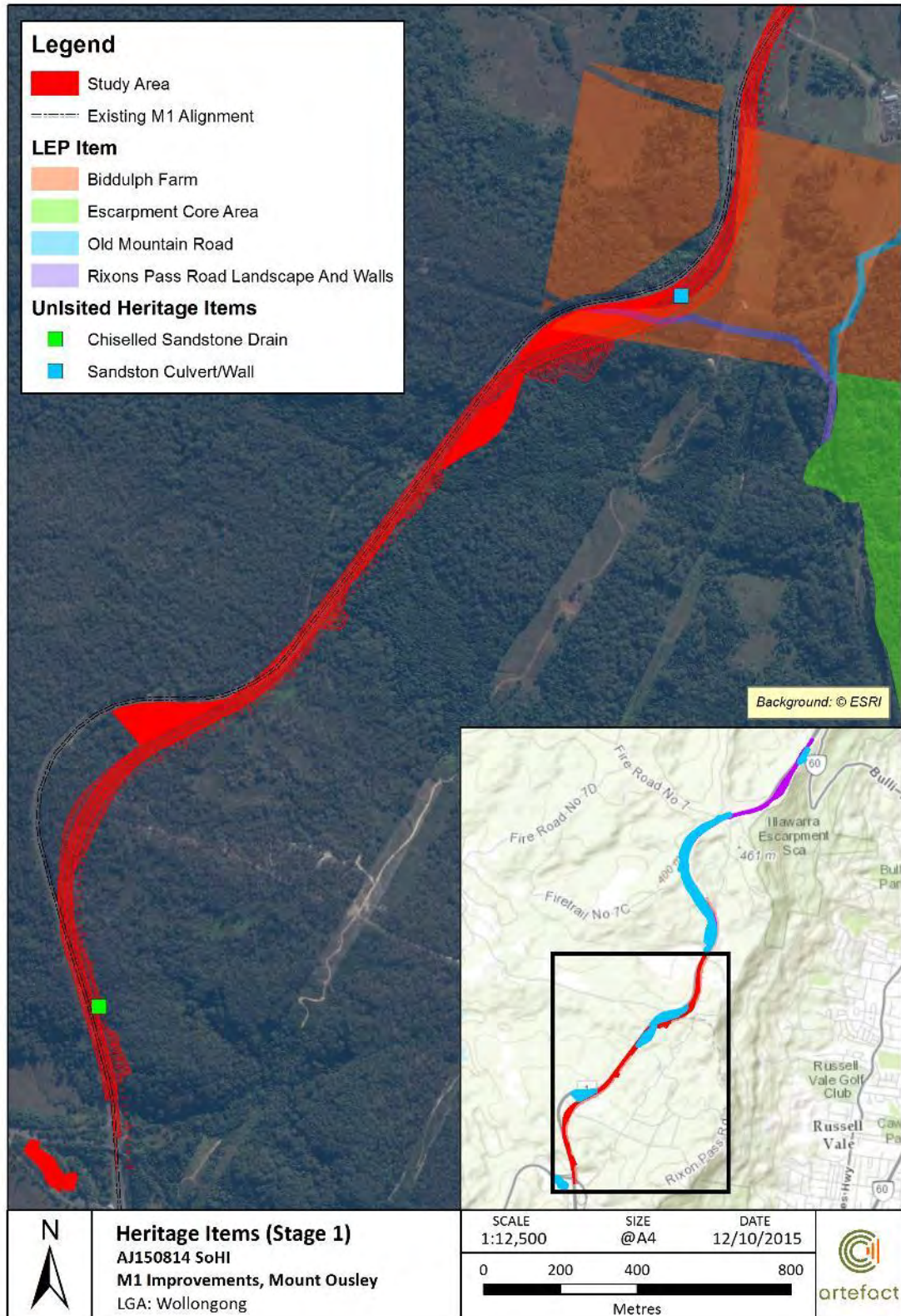
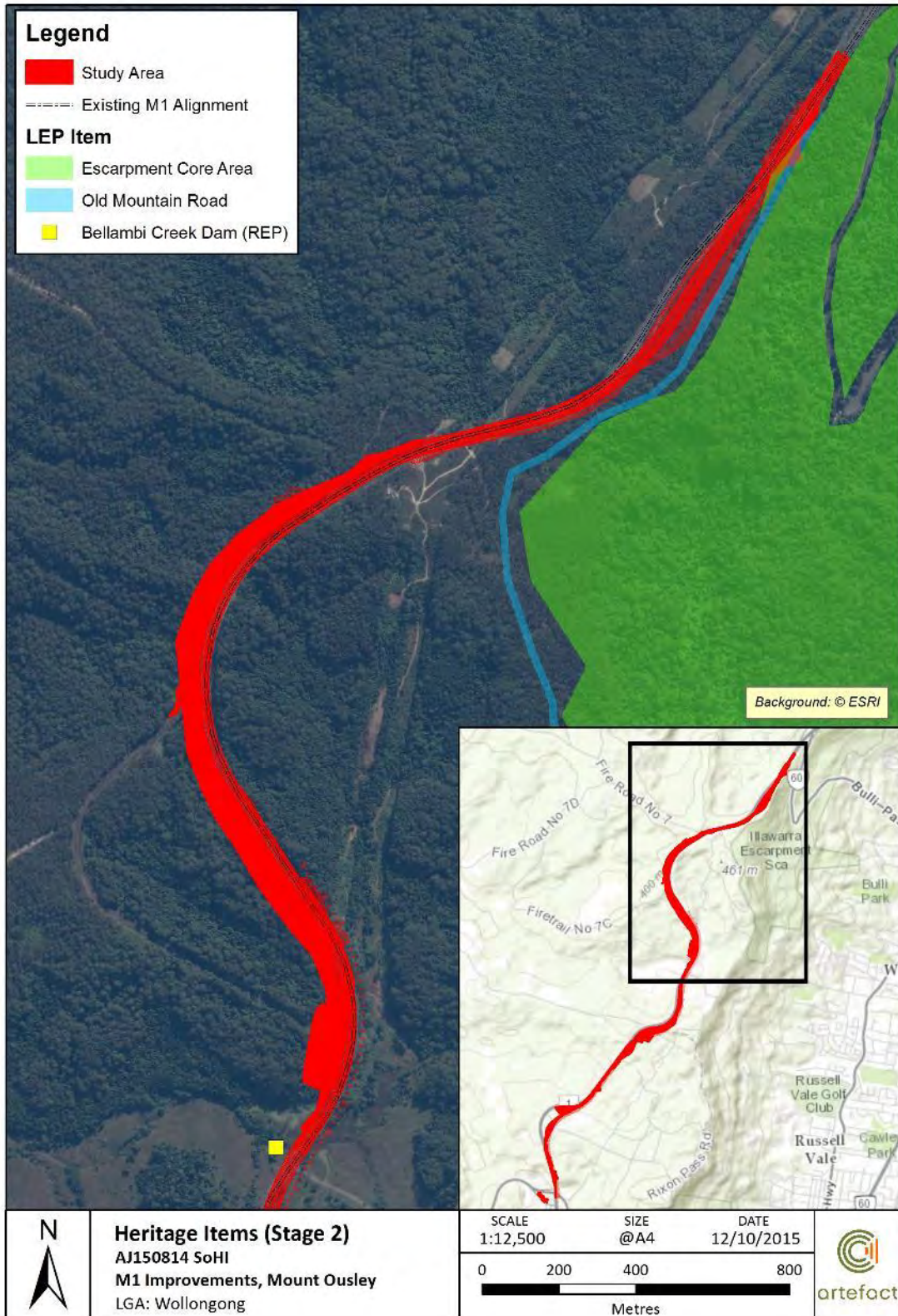


Figure 14: Stage Two study area with listed and unlisted heritage items



5.0 HERITAGE ASSESSMENT

5.1 Assessment methodology

Determining the significance of archaeological items or items of heritage significance is carried out by utilising a system of assessment informed by the *Burra Charter* of Australia ICOMOS. The principles of the charter are relevant to the assessment, conservation and management of sites and relics. The assessment of significance is outlined through legislation in the Heritage Act and implemented through the NSW Heritage Manual and the Archaeological Assessment Guidelines (NSW Heritage Office 1996: 25 – 27). If an item meets one of the seven heritage criteria, and retains the integrity of its key attributes, it can be considered to have significance. The significance of an item or potential archaeological site can then be assessed as being of local or state significance, based on a series of criteria that have been developed for assessing significance relating to archaeological sites and their associated 'relics'. The criteria identify a series of questions that could be asked in relation to the item to assist in the identification of the appropriate level of significance to be applied.

- 'State heritage significance', in relation to a place, building, work, relic, moveable object or precinct, means significance to the state in relation to the historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic value of the item
- 'Local heritage significance', in relation to a place, building, work, relic, moveable object or precinct, means significance to an area in relation to the historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic value of the item (NSW Heritage Office 1996: 6).

The heritage significance assessment criteria are outlined in Table 3 below.

Table 3: NSW heritage assessment criteria

Criteria	Description
A – Historical Significance	An item is important in the course or pattern of the local area's cultural or natural history.
B – Associative Significance	An item has strong or special associations with the life or works of a person, or group of persons, of importance in the local area's cultural or natural history.
C – Aesthetic or Technical Significance	An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in the local area.
D – Social Significance	An item has strong or special association with a particular community or cultural group in the local area for social, cultural or spiritual reasons.
E – Research Potential	An item has potential to yield information that will contribute to an understanding of the local area's cultural or natural history.
F – Rarity	An item possesses uncommon, rare or endangered aspects of the local area's cultural or natural history.
G – Representative	An item is important in demonstrating the principal characteristics of a class of NSWs (or the local area's): <ul style="list-style-type: none"> • cultural or natural places; or • cultural or natural environments.

5.2 Listed heritage items

5.2.1 Old Mountain Road

The Old Mountain Road is listed on the Wollongong LEP 2009 as item 6517. The item extends from near the eastern edge of the present M1 Princes Motorway approximately 600 m south of the Bulli Pass interchange, and extends for 4.5 km to the south until it meets with Rixons Pass Road on the edge of the Illawarra Escarpment 600 metres east of the present M1 Princes Motorway. The item is listed as 20 m wide in extent.

The Old Mountain Road intersects with the study area at its far northern terminus (see Figure 14). Approximately 1,120 m² of the item is within the study area and is proposed for a worksite.

History

The Old Mountain Road was originally known as Throsby's Track and was the earliest European land route into the Illawarra region. The track was located to the south of today's Bulli Pass and runs parallel to the M1 Princes Motorway along the edge of the Illawarra Range before descending eastwards down a steep descent towards the coast.

The difficulty of the escarpment descent led to the road becoming obsolete by the mid-19th century. While the southward running ridge-road remained in use to link up to other roads (particularly Rixons Pass Road, described below), the escarpment descent was soon superseded by other hill passes, in particular Westmacott's and Rixon's passes, to the north and south respectively.

In the 1890s the lower, eastward section of the road was purchased by George Adams to access his recently acquired Bulli Coal Company reserves on the escarpment, and was likely to have been renamed as the 'Old Mountain Road' at this time. It was no longer used for animal or vehicle traffic and instead was only used as a walking track.

While portions of the road that followed the ridge line traversed, or were incorporated into, transmission line and fire trail vehicle access tracks, the old alignments in the eastern area of Old Mountain Road was only rediscovered in 1968 after severe bushfires cleared the vegetation in the area and revealed the route (McDonald 1979: 31).

Description

The Old Mountain Road is identifiable as a walking track for most of the northern length of its extent (Figure 15, Figure 16). Where it runs parallel to the Illawarra escarpment for its central and southern portions it is currently in use as a vehicle access track for nearby electricity transmission line infrastructure. As the original road was never sealed there is little potential that remnants of the former road surface would remain.

The area of Old Mountain Road that intersects the study area is located in its northern extent, and consists primarily of a canopied forest walking track that runs parallel to an existing transmission line easement (Figure 17). A vehicle parking area also intersects the Old Mountain Road listed item, but shows heavy ground disturbance from modern rubbish and deposited fill (Figure 18).

Figure 15: Old Mountain Road walking path adjacent to study area, north aspect



Figure 16: Old Mountain Road walking path adjacent to study area, south aspect



Figure 17: Transmission line easement traversing Old Mountain Road item, south aspect



Figure 18: Cleared vehicle stopping area, south aspect



Statement of significance

The Old Mountain Road is significant at a local level as it demonstrates the early exploration and exploitation of the Illawarra coastal plain by European pioneers. The assessment criteria are summarised in Table 4 below.

Table 4: Significance assessment of The Old Mountain Road

Criteria	Description
A – Historical Significance	The site demonstrates the history of the initial settlement and road building in the Illawarra region. This item has local significance under this criterion.
B – Associative Significance	The site is associated with the recorded travels of early Colonial figures such as Governor Macquarie, John Oxley and Allan Cunningham This item has local significance under this criterion.
C – Aesthetic or Technical Significance	This item does not meet the local significance threshold under this criterion.

Criteria	Description
D – Social Significance	This item does not meet the local significance threshold under this criterion.
E – Research Potential	This item does not meet the local significance threshold under this criterion.
F – Rarity	This item does not meet the local significance threshold under this criterion.
G – Representative	This item does not meet the local significance threshold under this criterion.

5.2.2 Rixons Pass Road

Rixons Pass Road is listed on the Wollongong LEP 2009 as item 6518. It extends from the M1 Princes Motorway (formerly Mount Ousley Road) in the west for approximately 860 m before it reaches the Illawarra escarpment and joins with Old Mountain Road from the north. Rixons Pass Road then descends the steep hill side via Rixons Pass for a further 2.5 km onto the Illawarra Plain. The item is listed as 20 m wide in extent.

Rixons Pass Road intersects the study area at its western terminus (see Figure 13). The portion of the item within the study area is around 3,600 m² in size.

History

Rixons Pass Road was formally established in 1848 following the path used by Illawarra mail carrier Benjamin Rixon. Until the upgrading of Westmacott's Pass Road for wheeled vehicles in 1868 it was the primary transit route into and out of the Illawarra by land and was still used for much of the 19th century as a secondary road. With the upgrading of the Bulli Pass road and the establishment of Mount Ousley Road in the 20th century, the escarpment sections of Rixons Pass Road fell into disuse.

Description

The lower, eastern extent of Rixons Pass Road is in use as a suburban street in the suburb of Russell Vale. At the western extent of this sealed, suburban section, are heritage listed dry sandstone walls associated with the original colonial era road (Figure 19). As the road ascends the escarpment from the east, much of its original route has been superseded by fire trails and vehicle access tracks associated with electricity transmission lines (Figure 20, Figure 21). The western section of the road, part of which is inside the study area, is a graded but unsealed vehicle access track in current use (Figure 22). As the original road was never sealed there is little potential for remains of the former road surface to be present.

Figure 19: Rixons Pass Road sandstone walls.
Source: OEH



Figure 20: Rixons Pass Road in use as fire trail, west aspect



Figure 21: Rixons Pass Road transmission line vehicle access track, south aspect



Figure 22: Rixons Pass Road transmission line vehicle access track, west aspect



Statement of significance

Rixons Pass Road is significant at a local level as it demonstrates the early pastoral exploitation of the Illawarra region and communication routes into and out of the region. The assessment criteria are summarised in Table 5 below.

Table 5: Significance assessment of Rixons Pass Road

Criteria	Description
A – Historical Significance	The site demonstrates the history of the initial settlement, road building and communication routes into and out of the Illawarra region. This item has local significance under this criterion.
B – Associative Significance	This site is associated with the achievements of early Illawarra bush tracker, mail carrier and pioneer Benjamin Rixon. This item has local significance under this criterion.
C – Aesthetic or Technical Significance	The extant walls located at the eastern margin of this site are an example of early colonial architecture and make an important contribution to the character of the region. This item has local significance under this criterion.

Criteria	Description
D – Social Significance	This item does not meet the local significance threshold under this criterion.
E – Research Potential	This item does not meet the local significance threshold under this criterion.
F – Rarity	This item does not meet the local significance threshold under this criterion.
G – Representative	This item does not meet the local significance threshold under this criterion.

5.2.3 Site of the former 'Biddulph Farm'

The site of the former 'Biddulph Farm' is listed on the Wollongong LEP 2009 as item 6164. It is a roughly rectangular area of land that crosses the M1 Princes Motorway south of Bellambi Creek. It is approximately 950 m by 600 m in extent. On its southern margin it intersects with the listed LEP item of Rixons Pass Road. On its eastern margin it also intersects with the listed LEP items of Old Mountain Road and the Illawarra Escarpment Landscape Area.

The curtilage of the former Biddulph farm intersects with the eastern extent of the study area south of Bellambi Creek. This intersected area forms a predominately north-south aligned corridor of between 30m and 70m in width, with a total area of approximately 32,500 m² in size. Figure 13 shows the extent of the curtilage of the LEP item and the study area in detail.

History

Edmund 'Biddulph' Henning purchased 180 hectares of land from the Colonial Government in 1855 where he built a cottage and cleared some of the land for cattle pasture (see Figure 23 below) and sold it in 1857 to a coal mining developer. Life at this property was extensively recorded by Edmund Henning's sister, Rachel Henning, who lived at the property and wrote a large volume of letters describing colonial life which were later published.

Figure 23: 1898 Parish map of Woonona showing the Biddulph farm property extent, Rixons Pass to the southeast. Study area in blue



Description

Today the property is largely covered in regrown native bushland and intersected by a number of roads and transmission lines. The M1 Princes Motorway runs through the centre of the property, while several fire trails and transmission line easement vehicle access tracks cross through the remainder of the property. No standing structures associated with the farm are located within the study area.

Figure 24: Regrowth vegetation on 'Biddulph Farm' site, north aspect



Figure 25: Fire trail on 'Biddulph Farm' site, east aspect



Statement of significance

The site of the former Biddulph Farm is significant at the local level. It demonstrates the history of early pastoral settlement in the Illawarra while also being associated with the colonial-era letter writer Rachel Henning. The assessment criteria are summarised in Table 6 below.

Table 6: Significance assessment of Biddulph Farm

Criteria	Description
A – Historical Significance	The site demonstrates the history of early pastoral settlement in the Illawarra region. This item has local significance under this criterion.
B – Associative Significance	This site is associated with the early colonial letter-writer Rachel Henning. This item has local significance under this criterion.
C – Aesthetic or Technical Significance	This item does not meet the local significance threshold under this criterion.
D – Social Significance	This item does not meet the local significance threshold under this criterion.
E – Research Potential	This item does not meet the local significance threshold under this criterion.
F – Rarity	This item does not meet the local significance threshold under this criterion.
G – Representative	This item does not meet the local significance threshold under this criterion.

5.2.4 The Illawarra Escarpment Landscape Area

The Illawarra Escarpment Landscape Area (IELA) is a large conservation area running along the edge of the Illawarra Range in discontinuous segments for approximately 56 km. It is listed twice – on the Wollongong LEP and the Wollongong City Council DCP, each with different extents.

The curtilage for the IELA on the Wollongong LEP listing intersects with the study area for approximately 50m at the northern extent of the study area, with a total size of approximately 3,300 m². Figure 14 shows a detailed plan of the intersection of this LEP item's curtilage with the study area.

The curtilage for the IELA on the Wollongong DCP listing intersects with the study area for approximately 1.6 km in length at the northern extent of the study area, with a total size of approximately 91,500 m². Figure 3 shows a detailed plan of the intersection of this DCP item's curtilage with the study area.

History

The Illawarra Escarpment Landscape Area is an area of steep escarpments and vegetation which has been listed as a heritage item for its environmental, historic and scenic characteristics. Since European settlement it has been known for its excellent views over the Illawarra coast, with high vantage points offering a wide angle of vision. In this area many of the earliest collieries, bullock trails and coal-hauling train tracks were laid. Early workers residences and mining villages remain in places on the lower slopes of the escarpment.

Description

The portion of the LEP-listed IELA that intersects with the study area is predominantly in use as a cleared vehicle rest area and vehicle access point for a nearby transmission line easement (Figure 26). This area has been cleared of vegetation and is largely disturbed with modern rubbish and fill (Figure 27).

The portion of the DCP-listed IELA that intersects with the study area is predominantly thick natural vegetation (Figure 28), with a transmission line easement (Figure 29) that runs parallel to the present M1 Princes Motorway for approximately 950m.

Figure 26: Vehicle stopping area, south aspect **Figure 27: Vehicle stopping area with ground disturbance, north aspect**



Figure 28: Thick vegetation in IELA, east aspect

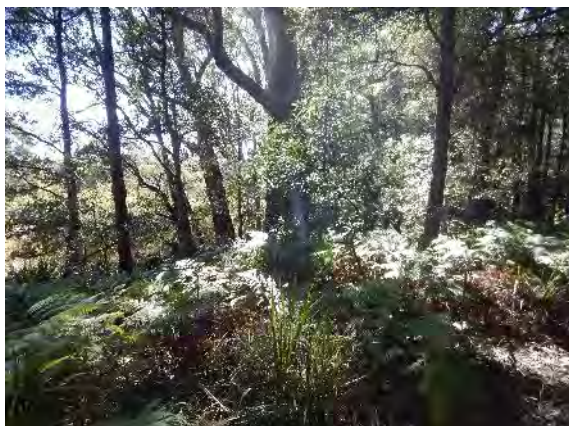


Figure 29: Transmission line in IELA, south aspect



Statement of significance

The Illawarra Escarpment Landscape Area is significant at a local level as it shows evidence of early historical settlement and coal discovery in the region. It is an aesthetically pleasing and unique natural feature which is prominent in the Illawarra landscape.

Due to the significance of the Illawarra Escarpment Landscape Area for the region, it has been given explicit developmental guidelines which are outlined in the Wollongong City Council DCP 2009 Chapter B6. The assessment criteria are summarised in Table 7 below.

Table 7: Significance assessment of the Illawarra Escarpment Landscape Area

Criteria	Description
A – Historical Significance	This site demonstrates the history of the early exploration of the Illawarra and the development of the coal industry in the region. This item has local significance under this criterion.
B – Associative Significance	This item does not meet the local significance threshold under this criterion.
C – Aesthetic or Technical Significance	This site is an aesthetically pleasing natural formation and is known for its scenic characteristics in the region. This item has local significance under this criterion
D – Social Significance	This item does not meet the local significance threshold under this criterion.
E – Research Potential	This item does not meet the local significance threshold under this criterion.
F – Rarity	This site is a unique historical and environmental feature in the Illawarra region. This item has local significance under this criterion.
G – Representative	This site demonstrates the principle characteristics of both escarpment natural heritage and colliery history in the Illawarra region. This item has local significance under this criterion.

5.2.5 Bellambi Creek Dam (Charlesworth's Dam)

Bellambi Creek Dam is a small dam abutment that blocks the flow of the upper reaches of Bellambi Creek. It is located at the eastern extent of the Bellambi Creek valley, 45 m to the west of the present M1 Princes Motorway and the study area. It is a listed item on the Illawarra Regional Environmental Plan as a part of the South Bulli Colliery.

History

The South Bulli Colliery was opened in 1861 by the Bulli and Bellambi Coal Company in what is now Russell Vale, at the foot of the Illawarra escarpment. The necessity of large quantities of water for their mining operations led to the construction of the Bellambi Creek Dam, to the west of the mine entrance, during the 1880s.

Description

The dam itself is a small brick abutment which acts as a reservoir for the upper waters of Bellambi Creek (Figure 30). The abutment itself is thickly vegetated (Figure 31). The higher waters of the dammed Bellambi Creek are bridged over by the M1 Princes Motorway and the valley surrounding the dam are largely cleared of thick vegetation.

Figure 30: Dam reservoir to the east of the M1 Princes Motorway



Figure 31: Bellambi Creek Dam with brick dam wall. West aspect



Statement of significance

The site of the Bellambi Creek Dam is significant at a local level as it is related to the early Colonial development of the colliery industry in the Illawarra region. It is a good representation of water management engineering required in the development of the coal industry in the Illawarra. The assessment criteria are summarised in Table 8 below.

Table 8: Significance assessment of the Bellambi Creek Dam

Criteria	Description
A – Historical Significance	The site demonstrates early colliery history in the Illawarra region due to being considered a part of the South Bulli Colliery (Old Bulli Mine). This item has local significance under this criterion.

Criteria	Description
B – Associative Significance	This item does not meet the local significance threshold under this criterion.
C – Aesthetic or Technical Significance	This item does not meet the local significance threshold under this criterion.
D – Social Significance	This item does not meet the local significance threshold under this criterion.
E – Research Potential	This item does not meet the local significance threshold under this criterion.
F – Rarity	This item does not meet the local significance threshold under this criterion.
G – Representative	The site is representative of water management systems required for early coal extraction mining technologies. This item has local significance under this criterion.

5.3 Mount Ousley Road and associated unlisted heritage items

History

Fears of foreign invasion in 1940 and the demands necessitated by increased military and civilian vehicle traffic at that time led to the NSW Department of Main Roads commissioning a new vehicle route over the Illawarra escarpment. Six hundred men were employed for the project which was scheduled to take six months (Newcastle Sun 20/01/1940). Construction of Mount Ousley Road was completed in 1942. The road linked with the Princes Highway at Bulli Tops and descended via Mount Pleasant and Mount Ousley onto the coastal plain.

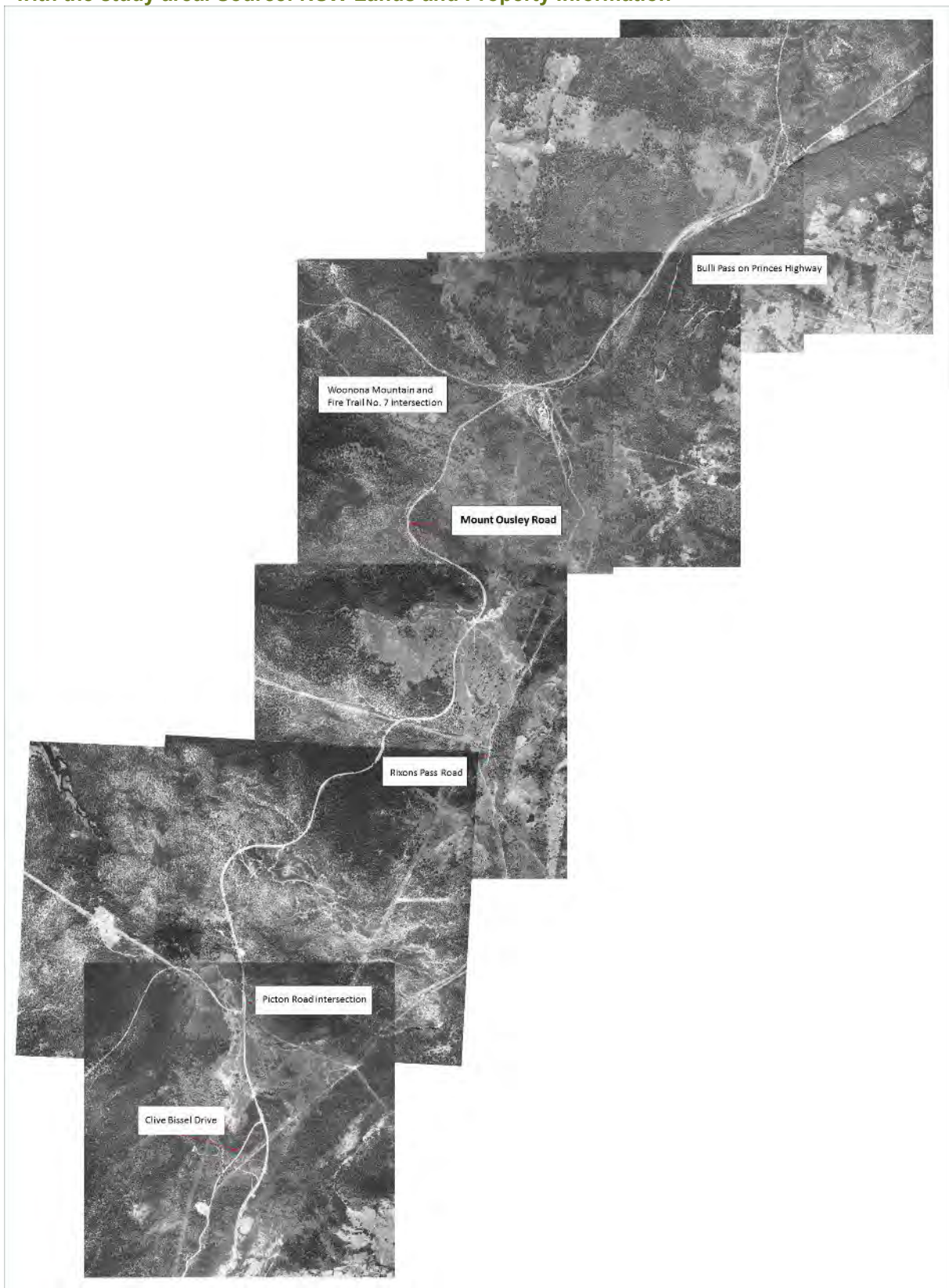
The Mount Ousley escarpment descent was constructed to replace the Bulli Pass descent to the north, and the Mount Keira descent to the south. The road runs primarily along the edge of the Illawarra escarpment, with a mostly straight road alignment and gentler grade for its final descent into the coastal plain at its southern end. Due to a straighter and safer design compared to other Illawarra escarpment descents, the road soon became the primary vehicle route into and out of the Illawarra (see Figure 33 for the original road alignment). It was connected with Picton Road and also handled the increasing volume of coal haulage vehicles that operated out of the collieries in the region.

The original Mount Ousley Road was single carriageway (Figure 32), with a steep climbing gradient and several sharply curved sections of road which were difficult to negotiate. Due to increased traffic jams and vehicle incidents with the rise in car ownership following the war, the road was successively upgraded. Additional lanes were added to the road in the 1960s and 1970s. In the 1980s and 1990s some of the more difficult curved sections of the road were removed, with additional sandstone cuttings into the mountain side to allow for new re-graded portions of the road.

Figure 32: Mount Ousley Road ca. 1950. Source: Wollongong City Library



Figure 33: 1948 aerial photographs (mosaic) of the original Mount Ousley Road associated with the study area. Source: NSW Lands and Property Information



5.3.1 Mount Ousley Road former road alignments

Description

The survey of Mount Ousley Road focused on former road alignments and areas adjacent to the present motorway. Three sections of former road alignment were identified (Figure 34, Figure 35). These former road sections remain bitumen sealed, although considerable degradation has occurred as result of weed growth and tree re-vegetation (Figure 36, Figure 37). These roads are often further obscured by soil accumulation and leaf litter. Numerous rock cuttings into the sandstone escarpment remain in these areas (Figure 38, Figure 39).

Figure 34: Old road alignment on Mount Ousley Road, south aspect



Figure 36: Vegetation growth along old road alignment, south aspect



Figure 35: Old road alignment on Mount Ousley Road, north aspect



Figure 37: Vegetation growth along old road alignment, north aspect



Figure 38: Sandstone cutting near old road alignment, west aspect



Figure 39: Sandstone cutting near old road alignment, northwest aspect



5.3.2 Sandstone culvert and retaining wall

Description

A sandstone culvert and an associated sandstone retaining wall were identified 35 m south east of the current alignment of the M1 Princes Motorway. The items are located on the upper and lower edges of an east-facing embankment in a thickly vegetated area.

The culvert consists of medium sized sandstone blocks, varying in size from 150mm to 300mm in length. The neatly cut sandstone blocks formed an arched roof and are bonded with a course grey mortar (Figure 40, Figure 41). Diagonal chisel marks are present along the face of the sandstone blocks. The culvert is surrounded by heavy vegetation and eroded soil from the surrounding landscape. In addition, the mouth of the culvert is blocked by fallen stone and leaf build-up.

The sandstone retaining wall is located one metre north of the sandstone culvert (Figure 42). The wall is heavily degraded and has been damaged by encroaching vegetation (Figure 43). The portion of the wall that remains intact consists of roughly cut sandstone blocks, varying in size from 120mm to 250mm. Some grey mortar is present.

Figure 40: Sandstone culvert, cleared of leaf litter, west aspect



Figure 41: Sandstone culvert, cleared of vegetation, southwest aspect



Figure 42: Sandstone retaining wall, west aspect



Figure 43: Sandstone retaining wall showing damage from vegetation, northwest aspect



Interpretation

While the age of the culvert and retaining wall is unclear from their design, the utilitarian appearance and use of material suggests a post-convict era construction. The location of the items however, associates them with the alignment of Mount Ousley Road (Figure 44).

Aerial photographs from 1948 show that in this section of Mount Ousley Road, an embankment, was constructed to support the road curve (Figure 45). The retaining wall and culvert are likely to be residual artefacts of a drainage system that existed on the edge of, and below, this embankment.

The use of sandstone blocks for a mid-20th century construction is unusual and probably demonstrates the re-using of local materials. Locally hewn sandstone from the Illawarra escarpment was a common building material in the 19th and early 20th centuries and it is likely that the sandstone was taken from such an earlier built structure.

Figure 44: Location of sandstone culvert and retaining wall relative to the M1 Princes Motorway. Source: Google earth



Figure 45: 1948 aerial photograph of Mount Ousley road, road embankment marked. Source: Land and Property Information



5.3.3 Sandstone drain

Description

A chiselled sandstone drain was identified 10 m east of the M1 Motorway at an elevation at least five metres higher than the present road level. The drain runs nearly parallel to the road alignment down a gentle slope. The sandstone carved-portion of the drain totals a length of 4.6 m in two discontinuous segments. The drain is a part of a larger ephemeral drainage channel which runs down the higher slopes of a steep crest above the upper tributaries of the Cataract River. It is located 30 m to the north of a sandstone cutting platform that adjoins the M1 Princes Motorway on the eastern side (Figure 46).

The drain has been cut into existing sandstone and is present in two discontinuous segments. The higher section to the north is 2.9 m in length with a drainage depth varying between 15 and 30 cm. It is on average 55 cm in width. This section of the drainage channel is gently curved to align the water flow from the east to the south (Figure 47).

The lower elevation section to the south is 1.7 m long and between 5 and 19 cm in depth. The incised portion of the drain is 30 cm in width although the overall exposed drainage channel is 80 cm in width. This section of incised channel is aligned north to south (Figure 48).

Machine chisel marks are evident on some of the outer surfaces of the incised sandstone (Figure 49).

Figure 46: Sandstone cut platform on M1 Princes Motorway, south aspect



Figure 47: Northern section of chiselled drain, east aspect



Figure 48: Southern section of chiselled drain, north aspect



Figure 49: Detail of machine chisel marks, northwest aspect



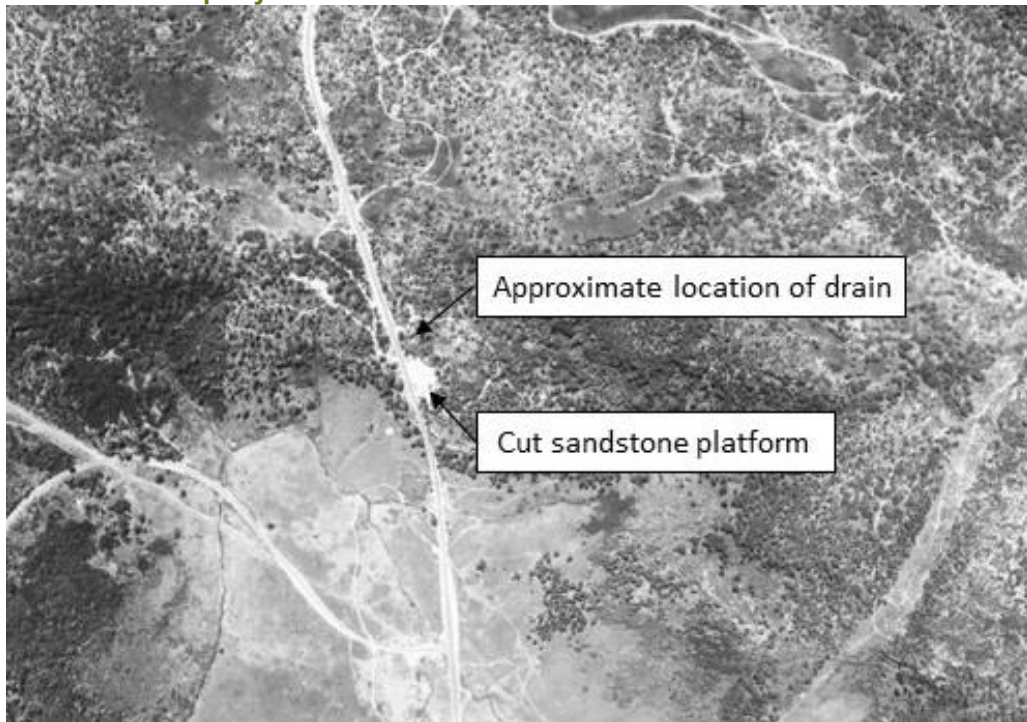
Interpretation

This section of the M1 Princes Motorway has not had its alignment altered since it was constructed as Mount Ousley Road in the 1940s. This steep graded section has been cut into a tall hill to the north of an upper unnamed tributary of the Cataract River. From 1948 aerial photographs it is clear that the sandstone cutting to the east of the M1 Princes Motorway was created during the road's original construction (Figure 50).

The steep hill crest is located in the eastern extent of the Cataract River catchment area. This area is prone to strong water flows during heavy rains which drain into Cataract Dam. The construction of Mount Ousley Road, with the large adjustments to the local topography from sandstone cutting through the hillside, resulted in altering the pre-existing upper drainage channels of the Cataract River. In this context it is likely that this drainage channel, which runs parallel to the road, was constructed to prevent flooding onto the road itself which is located several metres below the hill crest on either side. While the incised sandstone parts of the drainage channel are clearly artificially constructed, it is likely that the adjoining ditch drainage channel through partially eroded soil deposits was modified as well.

This type of drainage construction is unusual and likely represents an ad-hoc solution to water run-off problems during or shortly after the construction of Mount Ousley Road.

Figure 50: 1948 aerial photograph of Mount Ousley road showing cut sandstone platform.
Source: Land and Property Information



5.3.4 Assessment of Significance for Mount Ousley Road

Mount Ousley Road represents a large-scale 20th century infrastructure development. Decommissioned road alignments that remain on either side of the present Motorway demonstrate the first major vehicle traffic arterial road in the Illawarra region which was crucial in encouraging post-war economic growth in the Illawarra region. Furthermore, two residual items relating to the road's construction are unusual for a construction of this type. The sandstone culvert likely uses recycled carved sandstone blocks instead of concrete, which was the common construction material of the time. The chiselled sandstone drain shows a small-scale but effective solution to managing water flow and flooding onto Mount Ousley Road. As such, Mount Ousley Road is characterised as being of local heritage significance. The assessment criteria are summarised in Table 9 below. Mount Ousley Road is not considered a 'relic' under the NSW *Heritage Act 1977*.

Table 9: Significance assessment of Mount Ousley Road

Criteria	Description
A – Historical Significance	<p>Mount Ousley Road was constructed during war-time efforts to increase the volume and quality of road infrastructure in Australia, primarily for military purposes. These infrastructure initiatives encouraged economic growth post-war and, in the case of Mount Ousley Road, was pivotal in the development of the Illawarra by opening up the region to large scale vehicular traffic.</p> <p>The former road alignments of Mount Ousley Road are representative of war-time construction efforts and the post-war economic boom and are of local significance under this criterion.</p>
B – Associative Significance	<p>Mount Ousley Road is not associated with any particular historical personages of note.</p> <p>This item does not meet the local significance threshold under this criterion.</p>

Criteria	Description
C – Aesthetic or Technical Significance	<p>The construction of Mount Ousley Road required large-scale initiatives of human and machine labour in order to grade the Illawarra escarpment that it traverses. Despite this, the former road alignments do not qualify for aesthetic or technical significance as they represent standard road-building practices of the time.</p> <p>Two residual items of road infrastructure are unusual. The sandstone culvert has likely used local recycled sandstone in its construction. The chiselled sandstone drain demonstrates a local technical adaptation to managing the difficult road building and water control conditions required for the construction of Mount Ousley Road. For these reasons these road infrastructure items are deemed of local significance under this criterion.</p>
D – Social Significance	<p>Mount Ousley Road does not possess any strong or special associations with a particular community or cultural group.</p> <p>This item does not meet the local significance threshold under this criterion.</p>
E – Research Potential	<p>Mount Ousley Road does demonstrate any potential to yield information that will contribute to our understanding of the Illawarra region's history beyond what is already understood about the road from the historical record.</p> <p>This item does not meet the local significance threshold under this criterion.</p>
F – Rarity	<p>Mount Ousley Road is not an unusual or unique type of 20th century road construction and its obsolete road alignments are not unusual for major arterial thoroughfares which have been upgraded over time for increased traffic volume.</p> <p>This item does not meet the local significance threshold under this criterion.</p>
G – Representative	<p>Mount Ousley Road is representative of large scale mid-20th century road building projects typically found in areas of difficult topography in New South Wales. Although the road demonstrates the principal characteristics of this type of construction, it is not considered particularly representative.</p> <p>This item does not meet the local significance threshold under this criterion.</p>

6.0 ARCHAEOLOGICAL POTENTIAL

Non-Aboriginal archaeological potential is defined as the potential of a site to contain historical archaeological relics, as classified under the NSW *Heritage Act 1977*. Non-Aboriginal archaeological potential is assessed by identifying former land uses and associated features through historical research, and evaluating whether subsequent actions (either natural or human) may have impacted on evidence for these former land uses.

The local heritage items of Old Mountain Road and Rixons Pass Road are listed as former 19th century roads. These roads were unsealed and did not feature substantial drainage or road kerbing. The archaeologically ephemeral nature of these colonial roads and subsequent disturbance means that there is unlikely to be archaeological evidence of the former road surfaces or associated infrastructure remaining.

The Old Mountain Road area that intersects with the study area has been cleared and levelled by modern machinery for use as a vehicle access point and stopping bay for nearby transmission line easements. The portion of Rixons Pass Road within the study area currently used as a graded and unsealed fire trail. As such, neither heritage item has been assessed to have archaeological potential.

The curtilage of the former 'Biddulph farm' site which is partially within the study area is approximately 32,550 m² in extent, which is 6.24% of the total curtilage area of the LEP item. However, there is no evidence that the section of the 'Biddulph farm' within the study area contained historic structures and it is likely it was used for solely for pasture (see Figure 51 and Figure 52 for detail of where the Biddulph farm cottage was located). The curtilage area of this LEP item that is within the study area is therefore assessed as having a low archaeological potential and any remains would be unlikely to reach the threshold of local significance.

A summary of the archaeological potential of all the listed and unlisted items in the study area can be seen in Table 10 below.

Figure 51: 1950s era diagram showing Henning's cottage (outlined in red). Note that the diagram is orientated with west at top of map

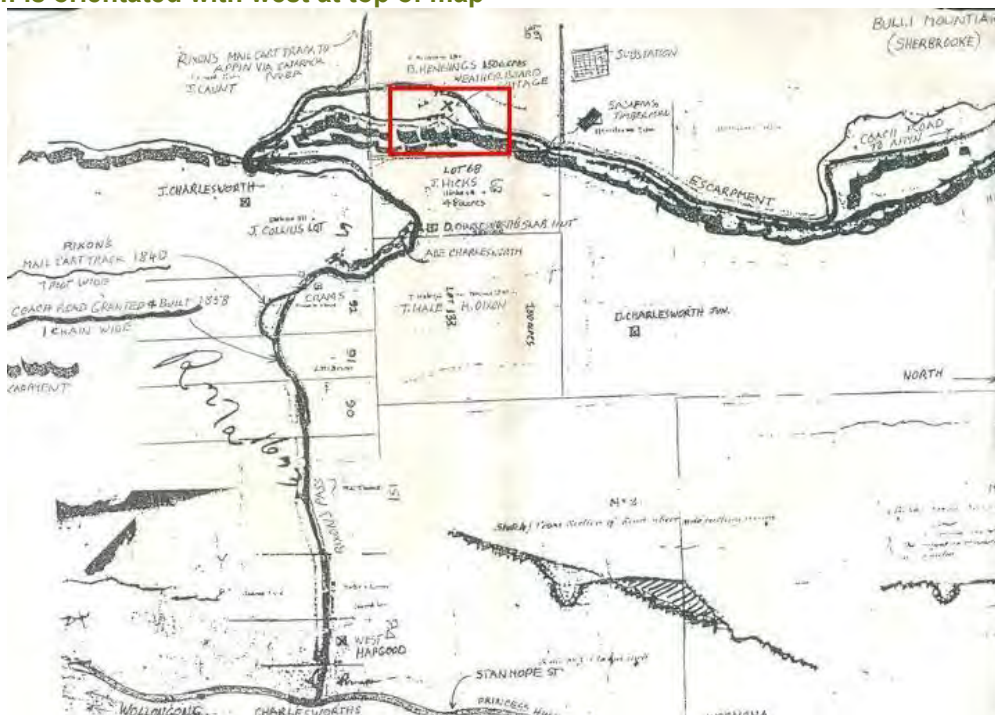


Figure 52: Probable location of Henning's cottage in relation to the study area (in red)



Table 10: Summary of archaeological potential of listed and unlisted items in the study area

Item	Listing	Description	Modern disturbance	Archaeological Potential
Old Mountain Road	Wollongong LEP	Unsealed walking track through vegetated areas with undulating topography.	High	Unsealed tracks are archaeologically ephemeral in nature and have a low likelihood of preserving archaeological remains. The portion of this item within the study area is extensively disturbed by modern landscaping. No archaeological potential.
Rixons Pass Road	Wollongong LEP	Unsealed road from present Mount Ousley Road down escarpment to the Illawarra	High	Unsealed tracks are archaeologically ephemeral in nature have a low likelihood of preserving archaeological remains. The portion of this item in the study area is in use as a fire trail and vehicle access track and as such is highly disturbed. No archaeological potential.
Site of the former 'Biddulph Farm'	Wollongong LEP	Site of former cottage and farm property of Edmund Biddulph Henning on the edge of the Illawarra escarpment.	High	The section of the Biddulph Farm within the study area is extensively disturbed. No archaeological potential for the section of item within the study area
Illawarra Escarpment Landscape Area	Wollongong LEP Wollongong DCP	Conservation area on the Illawarra escarpment	High	Not classified as an archaeological site. No archaeological potential.
Bellambi Creek Dam	Illawarra REP 1	Small dam abutment 50 metres west of the study area	N/A	Not within study area.
Mount Ousley Road	Unlisted	Motorway with obsolete road alignments and two small ancillary structures	Moderate	A modern road in present use. Obsolete road alignments are not archaeologically significant and are unlikely to contain former road surfaces. No archaeological potential.

7.0 IMPACT ASSESSMENT

The proposal involves the re-alignment and widening of the M1 Princes Motorway from the Bulli Tops in the north to the intersection with Picton Road in the south. This proposal would involve construction of sandstone cuttings and embankments, clearing of vegetation and significant ground disturbance.

7.1 Statement of heritage impact

Overall, the proposal would have minor impacts on four listed heritage items located within the study area and would have direct impacts on two items associated with the unlisted former alignment of Mount Ousley Road. There are unlikely to be impacts to significant archaeological remains as a result of the proposal.

7.1.1 Old Mountain Road

The section of the Old Mountain Road within the proposal area has been extensively disturbed as a result of modern road construction and the deposition of rubbish and fill. As such the proposal would not impact physical fabric of heritage significance within the item's curtilage.

The proposal would not impact any known archaeological remains associated with the item.

The former road alignment is largely overgrown with dense vegetation, therefore visual amenity does not contribute to its heritage significance. The proposal will not impact any views or vistas relating to this heritage item.

It is likely that the curtilage of this heritage item will be reduced by the proposed works. The curtilage would be reduced by around 1,115, or 1.17% (Table 11, Figure 53). Wollongong City Council should be consulted regarding these impacts during the development process.

7.1.2 Rixons Pass Road

The section of the Rixons Pass Road within the proposal area has been extensively disturbed as a result of use of the road as a fire-trail and modern vehicle access track. As such the proposal will not impact physical fabric of heritage significance within the item's curtilage.

The proposal will not impact any known archaeological remains associated with the item.

The road is in use as a current fire trail its visual amenity does not contribute to its heritage significance. The proposal will not impact any views or vistas relating to this heritage item.

It is likely that the curtilage of this heritage item will be reduced by the proposed works. The curtilage would be reduced by around 3,626, or 5.54% (Table 11, Figure 53). Wollongong City Council should be consulted regarding these impacts during the development process.

7.1.3 Site of the former 'Biddulph farm'

The section of the former 'Biddulph farm' within the proposal area is heavily vegetated with re-growth over the cleared pasturage from the original farm. There are not expected to be impacts to any elements of built heritage significance within the item

As the site of the former cottage is located outside of the proposal area, the proposal will not impact any archaeological remains.

The section of the item within the study area does not possess visual characteristics that contribute to its heritage values. The existing road already transects the items and has isolated the western section from the main curtilage area. The proposal will not impact any views or vistas relating to this heritage item.

It is likely that the curtilage of this heritage item will be reduced by the proposed works. The curtilage would be reduced by around 32,550, or 6.24% (Table 11, Figure 53). Wollongong City Council should be consulted regarding these impacts during the development process.

7.1.4 Illawarra Escarpment Landscape Area

The section of the Illawarra Escarpment Landscape Area within the proposal area has been extensively disturbed by modern road construction and the deposition of modern rubbish and fill.

Archaeological remains associated with the Illawarra Escarpment Landscape Area are related to early collieries which are located outside of the proposal area at the base of the escarpment. It is unlikely that the proposal would impact archaeological remains.

It is likely that there will be minor visual impacts to the Illawarra Escarpment Landscape Area. However as the present M1 Princes Motorway already has resulted in some visual impacts to the IELA, and as a relatively small portion of the item that would be impacted, the proposal will not substantially alter the visual characteristics of the LEP item overall.

It is likely that the curtilage of this heritage item will be reduced by the proposed works. The curtilage would be reduced by around 3,358, or <0.01%% (Table 11, Figure 53). Wollongong City Council should be consulted regarding these impacts during the development process.

7.1.5 Bellambi Creek Dam

The proposal will have no physical or archaeological impact on the Illawarra REP heritage listed item of the Bellambi Creek Dam as the dam lies outside of the area of proposed works. The proposal will not impact any visual characteristics of the item to a greater extent than that caused by the present configuration of the M1 Princes Motorway.

7.1.6 Mount Ousley Road

Obsolete road alignments of Mount Ousley Road would be subject to minor impacts by the proposed works. These road alignments will likely be used for vehicle access during construction of the proposed upgrade, and some portions immediately adjacent to the present course of the M1 Princes Motorway would be physically removed in order to construct additional climbing lanes. There would therefore be minor visual and physical impacts to the item.

Two unlisted sandstone structures associated with the early construction of Mount Ousley Road would be impacted by construction of stage one of the proposal. These items are assessed as having local heritage significance but are not classified as relics. The sandstone culvert with its associated sandstone retaining wall is located near the centre of the proposed new road alignment of the M1 Princes Motorway and as such would be removed during construction. The chiselled sandstone drain is located in an area where the sandstone facing would be recut to reshape the eastern road embankment, and as such this item would also be removed during construction.

Figure 53: LEP item curtilages in relation to northern part of study area (stage two)

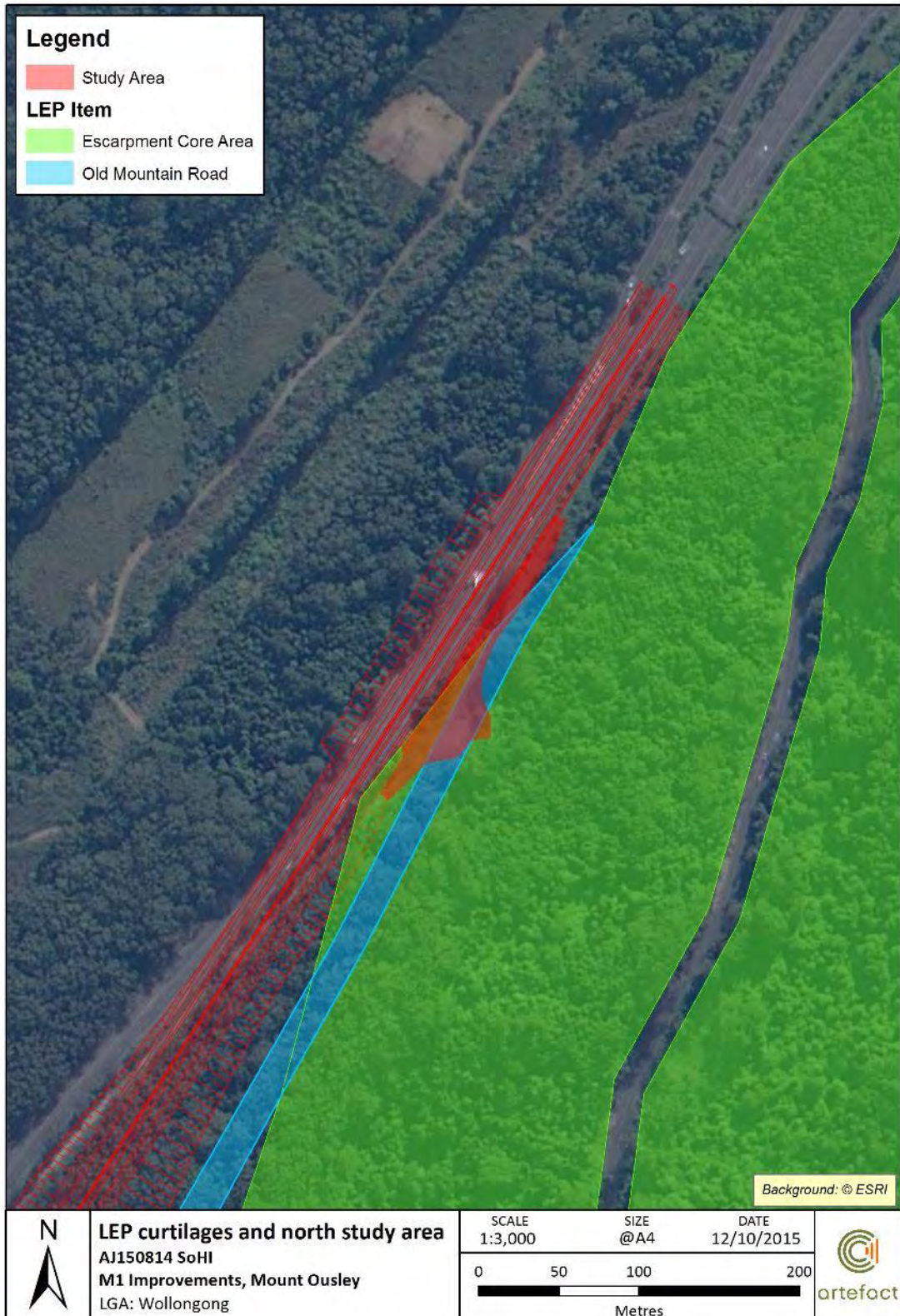


Figure 54: LEP item curtilages in relation to central part of study area (stage one)

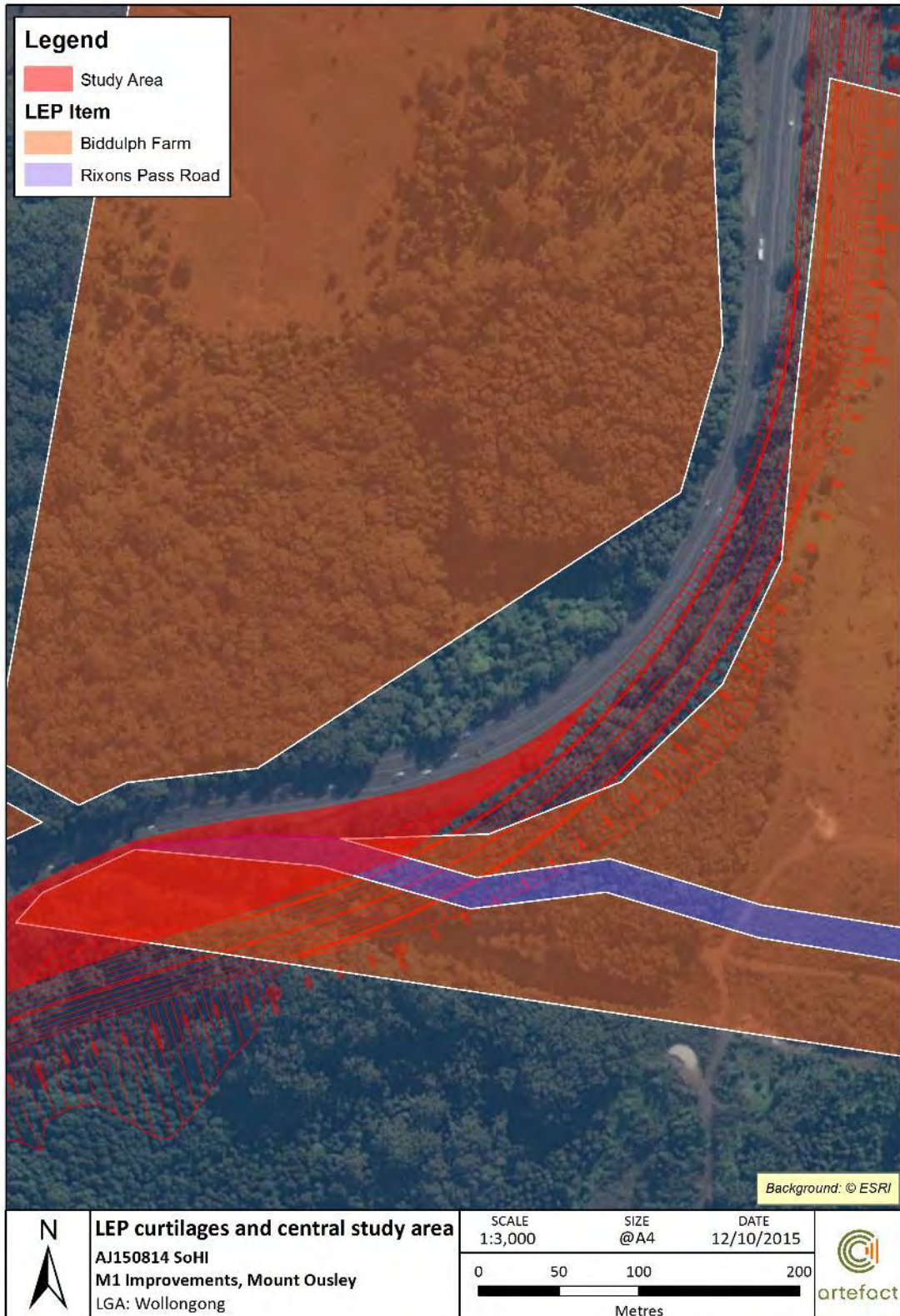


Table 11: Area of LEP item curtilages in relation to the study area

LEP Item	Size of curtilage intersecting with the study area (m ²)	Total size of LEP item's curtilage (approx. m ²)	Percentage of LEP item intersecting with the study area
Old Mountain Road	1,115	96,000	1.17%
Rixons Pass Road	3,626	65,500	5.54%
Site of former 'Biddulph farm'	32,550	522,000	6.24%
Illawarra Escarpment Landscape Area	3,358	67,556,000	<0.01%

Table 12: Summary of impacts to heritage items and archaeological remains

Item	Listing	Impacts to heritage fabric	Impacts to archaeological remains	Impacts to views and vistas
The Old Mountain Road	Wollongong LEP	Minor impacts to curtilage	None	None
Rixons Pass Road	Wollongong LEP	Minor impacts to curtilage	None	None
Site of the former 'Biddulph farm'	Wollongong LEP	Minor impacts to curtilage,	None	None
Illawarra Escarpment Landscape Area	Wollongong LEP Wollongong DCP	Minor impacts to curtilage	None	Minor visual impacts
Bellambi Creek Dam	Illawarra REP	None	None	None
Mount Ousley Road	Not listed	Minor impact to fabric of obsolete road alignments The two unlisted items associated with the former alignment would be removed by the proposed works	None	Minor visual impacts

Table 13: Statement of heritage impact for proposed works, stages 1 and 2

Development	Discussion
What aspects of the proposal respect or enhance the heritage significance of the proposal site?	Heritage impacts overall will be minor. There will be minor visual impacts to the Illawarra Escarpment Landscape Area and Mount Ousley Road. All four LEP listed items will have minor impacts to their curtilage. Physical impacts will occur to decommissioned road alignments and two unlisted items associated with the former Mount Ousley Road alignment. Impacts to the two unlisted items can be effectively mitigated by archival recording.

Development	Discussion
<p>What aspects of the proposal could have a detrimental impact on the heritage significance of the proposal site?</p>	<p>The proposed works will only physically impact areas which have already been significantly disturbed in the area of Old Mountain Road, Rixons Pass Road and the site of the former 'Biddulph farm'. The proposed works will not visually impact these items.</p> <p>The proposal would have minor visual impacts on the Illawarra Escarpment Landscape Area conservation and heritage zone.</p> <p>The proposed works would impact the curtilages of the LEP-listed heritage items of the Old Mountain Road, Rixons Pass Road, the site of the former 'Biddulph farm' and the Illawarra Escarpment Landscape Area.</p> <p>The proposed works would impact decommissioned road alignments and two unlisted items associated with the original construction of Mount Ousley Road, an unlisted heritage item.</p>
<p>Have more sympathetic options been considered and discounted?</p>	<p>The proposed road corridor has gone through several design phases. Due to the difficult topographic landscape of the Illawarra escarpment it is not practicable to significantly alter the road alignment and work site locations in order to avoid heritage items in the study area.</p>

8.0 MITIGATION MEASURES

The Illawarra Escarpment Landscape Area, both as a heritage conservation item on the Wollongong LEP 2009 and the Wollongong City Council DCP 2009, will be subject to minor visual impacts. It is understood that Roads and Maritime will be conducting a visual impact assessment in accordance with *Guidelines for landscape character and visual impact assessment* (2013). This assessment would address any require mitigation measures and would take into account special provisions for the Illawarra Escarpment Landscape Area where required as outlined in the Wollongong City Council DCP 2009 Chapter B6.

Wollongong City Council would be consulted in regard to potentially reductions to the curtilages of the four heritage listed items located within the study area.

Former road alignments and the two unlisted sandstone items associated with Mount Ousley Road, while of local significance are not classified as 'relics' under the NSW *Heritage Act 1977*. It is recommended that the two unlisted sandstone items are archivally recorded prior to impacts occurring.

In the event of unexpected archaeological items being identified during construction, the Roads and Maritime Standard Management Procedure for Unexpected Heritage Items (2015) should be followed.

A summary of these mitigation measures is outlined in Table 14 below.

Table 14: Mitigation measures for impacted heritage items

Item	Physical impacts to heritage fabric and/or archaeological potential	Visual impacts	Mitigation Measures
The Old Mountain Road	Minor impacts to curtilage	No visual impacts	The Roads and Maritime Standard Management Procedure for Unexpected Heritage Items (2015) should be implemented in the case of unexpected finds. Wollongong City Council should be consulted regarding possible curtilage reduction.
Rixons Pass Road	Minor impacts to curtilage	No visual impacts	The Roads and Maritime Standard Management Procedure for Unexpected Heritage Items (2015) should be implemented in the case of unexpected finds. Wollongong City Council should be consulted regarding possible curtilage reduction.
Site of the former 'Biddulph Farm'	Minor impacts to curtilage	No visual impacts	The Roads and Maritime Standard Management Procedure for Unexpected Heritage Items (2015) should be implemented in the case of unexpected finds. Wollongong City Council should be consulted regarding possible curtilage reduction.
Illawarra Escarpment Landscape Area	Minor impacts to curtilage	Minor visual impacts	A visual impact assessment will be conducted for this design proposal. Roads and Maritime will assess these visual impacts in accordance with their (2013) <i>Guidelines for landscape character and visual impact assessment</i> . This visual impact assessment will also need to take into account special provisions outlined for the Illawarra Escarpment Landscape Area in the Wollongong City Council DCP 2009, Chapter B6. Wollongong City Council should be consulted regarding possible curtilage reduction.
Mount Ousley Road:			
Sandstone culvert with associated retaining wall	Drain and wall would be removed by the proposed works.	Minor visual impacts	The drain and retaining wall would be archivally recorded according to NSW Heritage Division standards (1998), prior to the commencement of works.
Chiselled sandstone drain			

9.0 RECOMMENDATIONS

Overview of findings

- There are four listed heritage items located within the proposal area. These are:
 - The Old Mountain Road (Wollongong LEP 2009)
 - Rixons Pass Road (Wollongong LEP 2009)
 - The site of the former 'Biddulph farm' (Wollongong LEP 2009)
 - The Illawarra Escarpment Landscape Area (Wollongong LEP 2009 and Wollongong DCP 2009).
- There is also one listed heritage item located within 50 m of the proposal area. This is:
 - The Bellambi Creek Dam (Illawarra Regional Environment Plan 1986).
- There is one unlisted item of potential local heritage significance within proposal area – Mount Ousley Road former alignments. There are two particular items of significance associated with the former alignments. These are:
 - A sandstone culvert and sandstone retaining wall, associated with the embankment built during construction of Mount Ousley Road in the early 1940s.
 - A chiselled sandstone drain, associated with water drainage management during construction of Mount Ousley Road in the early 1940s.
- There are no identified areas with the potential to contain subsurface archaeological remains within the proposal area.

Recommendations

- Archival recording would be undertaken prior to the commencement of works for two heritage items associated with the construction of Mount Ousley Road. One copy of the archival recording should be submitted to RMS. These items are:
 - The sandstone culvert and associated sandstone retaining wall
 - The chiselled sandstone drain
- Wollongong City Council would be consulted in regard to potentially reducing the curtilages of the four heritage listed items located within the study area
- Recommendations made by the visual impact assessment in relation to the Illawarra Escarpment Landscape Area would be followed in order to mitigate visual impacts to the item.
- If unexpected archaeological finds are discovered during the proposed works, the Roads and Maritime Standard Management Procedure for Unexpected Heritage Items (2015) would be followed. The NSW Heritage Division would be notified of the discovery of a relic in accordance with Section 146 of the NSW *Heritage Act 1977*
- A heritage induction would be provided to workers before construction begins informing them of the location of heritage items, and guidelines to follow if unexpected heritage items or deposits are located during works.

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