

# Richmond Vale Rail Trail Shared Pathway

Aboriginal Archaeological Survey  
Report

Report to GHD

March 2019



 artefact

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## EXECUTIVE SUMMARY

City of Newcastle Council, along with Cessnock City Council and Lake Macquarie City Council, is proposing to develop a 32-kilometre shared pathway from Kurri Kurri to Shortland (the 'Proposal'), utilising a former late nineteenth and early twentieth century rail corridor, known as the Richmond Vale Rail Trail (RVRT). The Proposal will involve the construction of a three-metre-wide path along the existing railway corridor and will involve ground disturbing activity along the route.

Artefact has been engaged by GHD, on behalf of City of Newcastle Council, to prepare an Aboriginal Archaeological Survey Report (ASR) for the proposed development. This ASR will be inputted into the REF and EIS which is being prepared for the Proposal in accordance with the requirements of Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).

This report assesses and documents the potential Aboriginal heritage impacts of the proposal. The aim of this report is to identify whether any Aboriginal objects or areas of archaeological potential would be impacted by the proposal, whether an Aboriginal Heritage Impact Permit (AHIP) would be required from the Office of Environment and Heritage (OEH), and to recommend if any further assessment and/or management or mitigation measures are required.

### Overview of Findings

Based on current designs, the proposal would cause ground-disturbing impacts to the following identified Aboriginal sites:

- RVRT AS1 (AHIMS ID 38-4-1874/ 38-4-1919)
- RVRT IF1 (AHIMS ID 38-4-1881/ 38-4-1920)
- RVRT AS2 (AHIMS ID 38-4-1875/ 38-4-1918)
- RVRT AS3 (AHIMS ID 38-4-1876/ 38-4-1917)
- RVRT IF2 (AHIMS ID 38-4-1882/ 38-4-1910)
- RVRT IF3 (AHIMS ID 38-4-1883/ 38-4-1922)
- RVRT AS 7 (AHIMS ID 38-4-1880/ 38-4-1923)
- RVRT IF4 (AHIMS ID 38-4-1884/ 38-4-1913)
- RVRT AS4 (AHIMS ID 38-4-1877/ 38-4-1915)
- RVRT AS5 (AHIMS ID 38-4-1878/ 38-4-1912)
- RVRT AS6 (AHIMS ID 38-4-1879/ 38-4-1916)
- RVRT PAD 1 (AHIMS ID 38-4-1926)
- RVRT IF8 (AHIMS ID 37-6-3806/ 37-6-3834)
- RVRT IF10 (AHIMS ID 37-6-3808/ 37-6-3832)
- RVRT IF11 (38-4-1925)
- HS2A (AHIMS ID 38-4-1583)

The following sites are immediately outside the study area and will not be impacted:

- RVRT IF5 (38-4-1885/ 38-4-1921)
- RVRT IF6 (AHIMS ID 38-4-1886/ 38-4-1911)

- RVRT IF7 (38-4-1887/ 38-4-1921)
- RVRT IF9 (37-6-3833/ 37-6-3807)

The study area boundary has been modified since the archaeological survey was conducted, resulting in removal of impacts to RVRT IF 3.

## Recommendations and Mitigation Measures

**Table 1: Overview of recommendations and mitigation measures**

Development	Discussion
<b>Approvals</b>	<p>Should it not be possible to avoid impacting Aboriginal sites during design and construction works, an AHIP is required prior to impacts. This AHIP application must be submitted to OEH with an Aboriginal Cultural Heritage Assessment Report (ACHAR). Full consultation with Aboriginal stakeholders in accordance with the OEH consultation requirements would need to be conducted.</p> <p>Archaeological test excavation, where required, would need to take place prior to the AHIP application being submitted.</p> <p>An impact assessment would need to be prepared for any early works that result in ground disturbance, such as geotechnical investigation, to determine if an AHIP would be required prior to early works commencing.</p>
<b>Avoidance of impact</b>	<p>Detailed design for the proposal should avoid impacting identified Aboriginal sites.</p>
<b>Clarification of impacts</b>	<p>The location and extent of potential impacts to identified sites within the disturbance boundary should be determined through detailed design and finalisation of constructability documentation. There is the potential to avoid impact to recorded Aboriginal sites within the disturbance boundary by relocating the location of vehicle access and ancillary facilities, for example.</p> <p>A number of recorded Aboriginal sites are located in close proximity to the study area. Following clarification of the location and extent of impacts within the study area, a consistency check, or update to this report, must be undertaken that identifies all recorded Aboriginal sites in close proximity to the study area and whether they will be impacted by the proposed works. There is potential for an increase, or decrease, in impacts to recorded Aboriginal sites.</p>
<b>Aboriginal stakeholder consultation</b>	<p>Comprehensive Aboriginal stakeholder consultation, carried out in accordance with the OEH 'Aboriginal cultural heritage consultation requirements for proponents 2010', must be conducted for the project.</p>
<b>Archaeological test excavation</b>	<p>Three areas have been identified with moderate archaeological potential and archaeological significance. Should these sites be impacted by the proposed works, archaeological test excavation, under OEH code of practice, must take place. Areas where archaeological test excavation is recommended include:</p>

Development	Discussion
	<ul style="list-style-type: none"> <li>• RVRT Archaeological Complex 1</li> <li>• RVRT AS 7</li> <li>• RVRT PAD 1</li> </ul> <p>The scope of archaeological test excavation at each location, particularly RVRT Archaeological Complex 1, and RVRT PAD 1, would require clarification once the extent of proposed works in those areas is known. Test excavation at RVRT Archaeological Complex 1 would focus on undisturbed areas within the site complex that will be impacted.</p>
<p><b>Further archaeological survey</b></p>	<p>The study area boundary has been adjusted since archaeological survey was conducted for this assessment. As such, any portion of the clearance and/ or disturbance boundary outside the original investigation area must be subject to further archaeological survey. Where there are no impacts proposed within the additional areas, a heritage consultant will advise if further field survey is required.</p>
<p><b>Future changes to the study area boundary</b></p>	<p>Due to the archaeologically sensitive nature of many areas bordering the study area, further archaeological investigation must take place should any aspect of the proposal go outside the area investigated for the archaeological survey.</p>
<p><b>Aboriginal Heritage Management Plan</b></p>	<p>An Aboriginal Heritage Management Plan (AHMP) should be prepared prior to commencement of works to delineate the location of Aboriginal sites, or portions of Aboriginal sites, within the study area. Where Aboriginal sites, or portions of Aboriginal sites, are located outside the proposed extent of impacts, those areas should be clearly identified as no-harm areas in order to remove the possibility of inadvertent impact.</p> <p>Several Aboriginal sites are located in close proximity to the study area boundary. As those sites were identified using a hand-held GPS, a surveyor may be required to clearly indicate the location of the study area on the ground in relation to the recorded site location. This will assist with determining impacts and establishing no-harm areas.</p> <p>The AHMP should include an unexpected finds procedure for the proposed works, including details of required Aboriginal stakeholder consultation, identification of the nature and extent of unexpected finds, and any reporting or permits that may be required prior to works recommencing.</p> <p>In addition to identified sites within the study area, an updated AHIMS search must be conducted for the AHMP that identifies Aboriginal sites in the vicinity of the study area for the AHMP. This would identify if Aboriginal sites are located on proposed access tracks, for example.</p>
<p><b>Identification of existing AHIPs</b></p>	<p>There is potential for existing AHIPs to overlap with the study area. Further liaison with OEH should be conducted to identify where existing AHIPs overlap with the study area.</p> <p>Where existing AHIPs overlap with the study area, the proponent must liaise with the AHIP holder to ensure that all proposed works are conducted in accordance with the AHIP conditions.</p>

Development	Discussion
	As part of this process, it must be clarified whether recorded Aboriginal site HS2A (AHIMS ID 38-4-1583) has been impacted by recent road construction works.
<b>Review of this report</b>	This report must be forwarded to ALALC, MLALC, and Native Title Claimants for review and comment.

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## 1.0 INTRODUCTION AND BACKGROUND

### 1.1 Introduction

City of Newcastle Council, along with Cessnock City Council and Lake Macquarie City Council, is proposing to develop a 32-kilometre shared pathway from Kurri Kurri to Shortland (the 'Proposal'), utilising a former late nineteenth and early twentieth century rail corridor, known as the Richmond Vale Rail Trail (RVRT). The Proposal will involve the construction of a three-metre-wide path along the existing railway corridor and will involve ground disturbing activity along the route.

Artefact has been engaged by GHD, on behalf of City of Newcastle Council, to prepare an Aboriginal Archaeological Survey Report (ASR) for the proposed development. This ASR will be inputted into the REF and EIS which is being prepared for the Proposal in accordance with the requirements of Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).

This report assesses and documents the potential Aboriginal heritage impacts of the proposal. The aim of this report is to identify whether any Aboriginal objects or areas of archaeological potential would be impacted by the proposal, whether an Aboriginal Heritage Impact Permit (AHIP) would be required from the Office of Environment and Heritage (OEH), and to recommend if any further assessment and/or management or mitigation measures are required.

### 1.2 Study Area and Scope

The study area is located within the original alignment of the Richmond Vale Railway (constructed between 1856 and 1904) and includes various access roads and temporary compound and stockpile areas. It crosses through three Local Government Areas (LGA): City of Newcastle Council, Lake Macquarie and Cessnock. The study area is located within the boundaries of the Awabakal Local Aboriginal Land Council (ALALC) and Mindaribba Local Aboriginal Land Council (MLALC). The study area is located within three Native Title claim areas which are discussed in further detail in section 2.4.

The study area is 32 kilometres in length and comprises former railway alignments from Shortland to Kurri Kurri/Pelaw Main. Ancillary tracks also include a two-kilometre spur to Tarro from Hexham and a two-kilometre spur from Minmi to one kilometre east of Lenaghans Drive. A number of construction access roads and potential lay down areas have been included in this assessment.

The study area comprises two impact areas:

- disturbance Boundary
- clearance Boundary

The disturbance boundary is the outer boundary for the project, and delineates the 'study area'. Proposed activities within the disturbance boundary include car parking for site workers, construction vehicle access, stockpile locations, and site compound locations. These works will not necessarily cause any ground disturbing impacts, although vehicle access during wet weather has the potential to impact the ground surface, and stockpile and compound sites can change water run-off patterns and cause erosion in adjacent areas.

Works within the clearance boundary will involve ground disturbing activities. This includes the construction of the shared path, vegetation removal, and modifications to cuttings and bridges, where required.

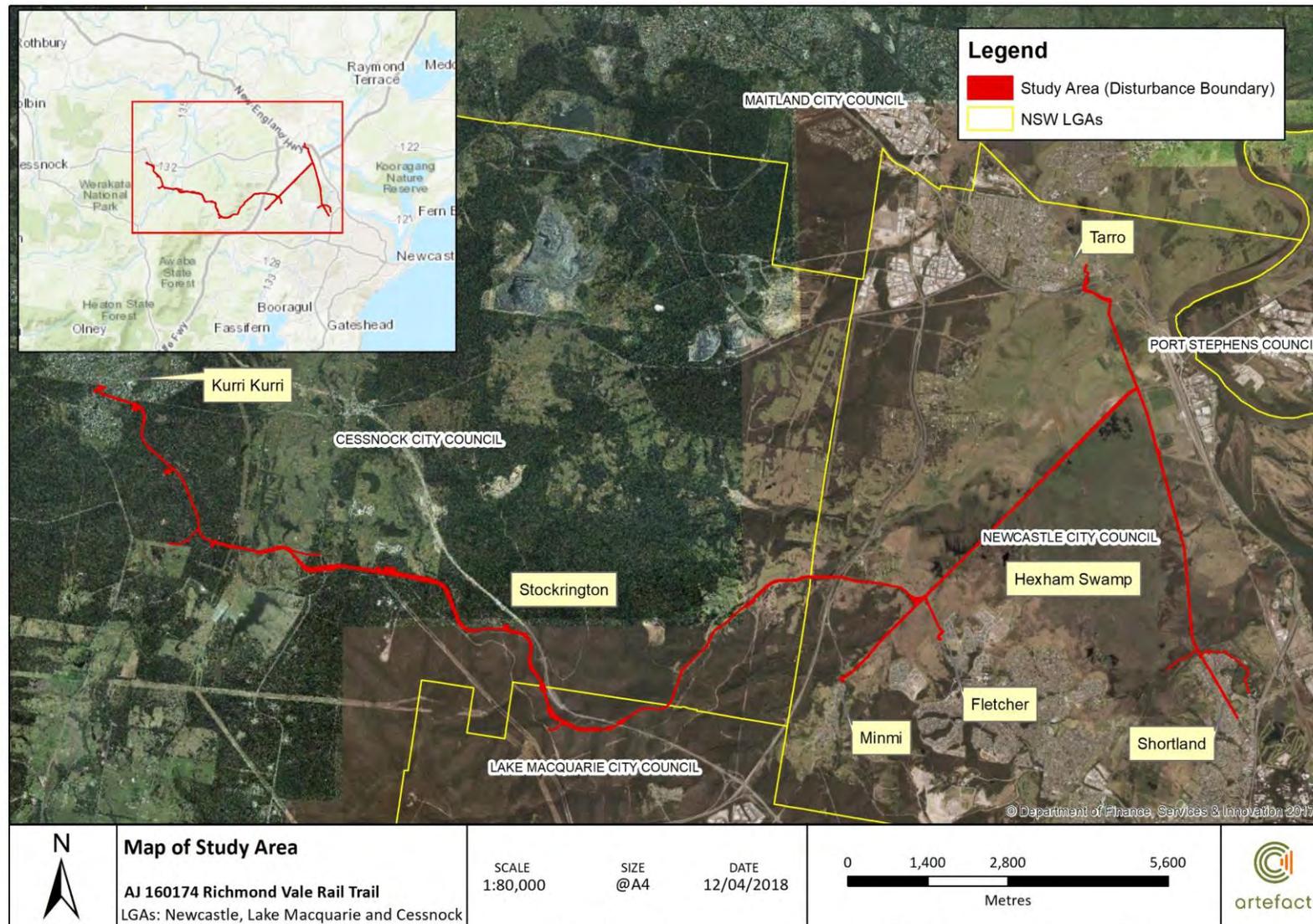
The location and extent of the study area is illustrated in Figure 1.

### 1.2.1 Changes to Study Area Boundary

The study area boundary has changed in certain areas since the archaeological field survey for this assessment was completed. As such, the description and mapping of survey units (Section 4.0) shows the study area boundary at the time the field survey took place. All other mapping shows the current extent of the study area.

The changes to the study area boundary has resulted in a decrease in the investigated area, such as the removal of a portion of the study area at Tarro, and some small increase in the study area in other areas. To manage these changes, a recommendation has been included in this report for further archaeological investigation of any areas where the study area has increased since the archaeological field survey was completed.

Figure 1: Location and extent of the study area



Document Path: C:\Users\GIS\Desktop\GIS\GIS\_Mapping\160174 Richmond Vale Rail Trail\MXD\Updated\_Maps\_20180412\Figure\_01\_Study\_Area\_20180412.mxd

### 1.3 The Proposal

The Proposal seeks to convert the Richmond Vale Railway, a mid-nineteenth and early-twentieth century railway line, into a shared pathway. This pathway would extend from Kurri Kurri to Shortland, utilising the former RVRT railway corridor.

Works for the Proposal would include the following:

- Removal of unsuitable subgrades along the existing rail alignment and proposed access routes and import of pavements such as gravel, asphalt and concrete
- Installation of seats at entrance to path and along path route
- Installation of hardwood timber bollards, heavy duty timber fencing, drinking fountains and bicycle fixing stations near rest/preparation areas
- Construction of an eastern and western embankment near Ironbark Creek Bridge
- Construction of a bridge over Ironbark Creek and clearance of weeds along proposed bridge footprint
- Clearance of overgrown vegetation along length of rail alignment
- Treatment of existing cuttings via:
  - vegetation clearance
  - formation of bund or drain along the upper extent of cuttings
  - Scaling of loose rock and soil along the face and upper extent of cuttings
  - Rock bolting of loose and unstable rock along the face and upper extent of the cuttings
  - Shotcreting weathered rock material along face of unstable cuttings
  - Meshing and fencing along cuttings to protect against rock falls
- Removal of existing timber overpass near Dog Hole Road and existing overbridge near Blue Gum Creek
- Improvement of drainage and paving within Tunnel 1 and Tunnel 2
- Replacement or stabilisation of Tunnel 3 and construction of drainage and paving within tunnel
- Establishment of temporary compound and stockpile areas at Dog Hole Road, Surveyors Creek, Wallis Creek, Knowledge Park, Kurri Kurri and Minmi Junction.
- Construction of carpark at George Booth Drive and Blue Gum Creek and removal of existing fence
- Construction of toilet block, amenities and carpark at Hunter Expressway compound access road
- Construction of an Overpass at Wallis Creek property
- Fencing and planting along existing rail alignment boundary to ensure privacy and security for nearby property at Wallis Creek.
- Fencing along approach and departure zones to bridges and shoulder of trail when running along large embankments.

- Potential removal of an existing timber truss bridge along Surveyors Creek and construction of multi-span concrete girder bridge over Surveyors Creek or construction 70 metre span suspension bridge (or alternative) with three span concrete girder, access path to bridge and coffer dam
- Construction of a small low lying culvert between Wallis Creek and Kurri Kurri
- Construction of a level crossing at Pokolbin Street level crossing, Kurri Kurri
- Construction of an elevated boardwalk along existing HWC pipeline easement between Fletcher and Minmi Junction.
- Addition of lighting at points of conflict such as road crossings, approaches to bridges, car parks and tunnels.
- Installation of directional and risk reduction signage at all access locations and at regular 500 metre intervals

## 1.4 Scope of this Assessment

The purpose of this report is to document the results of the assessment of the potential Aboriginal heritage impacts from the construction and operation of the RVRT shared pathway. This report supports the REF and EIS that is being prepared for the project. The scope of the present assessment includes:

- Details of consultation with ALALC, MLALC, and Native Title Claimants
- An overview of the Aboriginal history of the study area
- The results of a site survey
- Identification of Aboriginal sites and areas of archaeological potential within the study area
- Assessment of the significance of identified Aboriginal sites
- Conclusions and recommendations for the project in regard to Aboriginal heritage.

This study area is predominantly a long, linear transect which adheres to the former alignment of the RVRT. Only those areas which were designated within a potential disturbance boundary for the project was assessed in this report (the study area). Areas adjacent to the study area were not assessed in this report.

## 1.5 Report Structure

- Section 1 – Introduction: this section provides an introduction and background information for the proposal
- Section 2 – Statutory Requirements: describes the relevant heritage legislation for Aboriginal heritage in the study area
- Section 3 – Study Area Context: provides a succinct overview of the environmental and archaeological context of the study area
- Section 4 – Survey Methodology: methodology for the archaeological survey
- Section 5 – Survey Results: describes the site survey conducted for this assessment

- Section 6 – Archaeological Sites: describes AHIMS and newly identified Aboriginal archaeological sites identified during the survey
- Section 7 – Analysis and Discussion: provides a discussion of the results of the site survey
- Section 8 – Significance Assessment: provides an assessment of archaeological significance for the study area
- Section 9 – Impact Assessment: assessed potential impacts to identified Aboriginal sites
- Section 10 – Management and Mitigation Measures: outlines relevant management and mitigation measures for the proposal
- Section 11 – Conclusions and Recommendations: presents a summary of the study's findings and further requirements for Aboriginal heritage

## 1.6 Limitations and Constraints

This report provides an assessment for Aboriginal heritage. It does not provide an impact assessment for built heritage and archaeological potential.

Only the area within the provided disturbance boundary was surveyed for Aboriginal objects and sites. Areas outside the study area were not assessed for Aboriginal objects or archaeological potential.

Since completing site inspection and archaeological assessment, additional areas have been added to the study area for the Richmond Vale Rail Trail shared pathway project. This report only assesses those areas which have been physically surveyed. Further survey and Aboriginal stakeholder consultation will be required for additional areas outside the study area that were not subject to field survey for the current assessment.

## 1.7 Aboriginal Community Involvement

Three Aboriginal stakeholders were invited to participate in the site survey and provide Aboriginal cultural context. These participants were:

- Peter Townsend, representing the Awabakal Local Aboriginal Land Council (ALALC)
- Jason Brown, representing the Mindaribba Local Aboriginal Land Council (MLALC)
- Peter Leven, claimant for the Awabakal and Guringai People Native Title Claim (NC2013/002)

One Aboriginal stakeholder was invited to participate in the site survey but declined the offer. This was:

- Scott Franks, claimant for the Scott Franks and Anor on behalf of the Plains Clans of the Wonnarua People Native Title Claim (NC2013/006)

## 1.8 Report Authorship and Acknowledgements

This report was written by Duncan Jones (Heritage Consultant). Veronica Norman (Heritage Consultant) conducted background research. Management input and review was provided by Josh Symons (Principal).

## 2.0 STATUTORY REQUIREMENTS

### 2.1 National Parks and Wildlife Act (1974) (NPW Act)

The NPW Act, administered by the OEH provides statutory protection for all Aboriginal 'objects' (consisting of any material evidence of the Aboriginal occupation of NSW) and 'Aboriginal Places' (areas of cultural significance to the Aboriginal community).

The protection provided to Aboriginal objects applies irrespective of the level of their significance or issues of land tenure. However, areas are only gazetted as Aboriginal Places if the Minister is satisfied that sufficient evidence exists to demonstrate that the location was and/or is, of special significance to Aboriginal culture.

The NPW Act was amended in 2010 and as a result the legislative structure for seeking permission to impact on heritage items has changed. A Section 90 permit is now the only AHIP available and is granted by the OEH. Various factors are considered by OEH in the AHIP application process, such as site significance, Aboriginal consultation requirements, ESD principles, project justification and consideration of alternatives. The penalties and fines for damaging or defacing an Aboriginal object have also increased.

As part of the administration of Part 6 of the Act, OEH regulatory guidelines on Aboriginal consultation are in place, which are outlined in the 'Aboriginal Cultural Heritage Consultation Requirements for Proponents' (2010). Guidelines are also in place for the processes of due diligence as outlined in the 'Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW' (2010) in accordance with the 2010 amendment to the Act.

There are no gazetted Aboriginal Places within the proposal areas. All Aboriginal objects, whether recorded or not, are protected under the Act.

### 2.2 Environmental Planning & Assessment Act (1979)

The *Environmental Planning & Assessment Act 1979* (EP&A Act) is administered by the Department of the Planning and Environment and provides planning controls and requirements for environmental assessment in the development approval process. This Act has three main parts of direct relevance to Aboriginal cultural heritage, namely, Part 3 which governs the preparation of planning instruments, Part 4 which relates to development assessment process for local government (consent) authorities and Part 5 which relates to activity approvals by governing (determining) authorities.

Planning decisions within LGAs are guided by Local Environmental Plans (LEPs). Each LGA is required to develop and maintain an LEP that includes Aboriginal and historical heritage items which are protected under the EP&A Act and the *Heritage Act 1977*. The Newcastle (2012) and Cessnock (2011) LEPs (Part 5, Clause 5.10) makes standard provision for the protection of Aboriginal heritage items that applies to the current study area.

Development Control Plans (DCPs) provide specific and more detailed guidelines for certain types of development, or small sections within an LGA. These guidelines are in addition to the provisions of the LEP. Section 5.04.01 of the Newcastle DCP (2012) lists specific controls relating to Aboriginal heritage. Section 2.15 of the Lake Macquarie DCP (2014 – Revision 11) also lists specific controls relating to Aboriginal heritage within the Lake Macquarie area that are relevant to this study, in addition to referring to the Lake Macquarie City Council 'Sustainable management of Aboriginal Cultural Heritage in the Lake Macquarie Local Government Area: Lake Macquarie Aboriginal Heritage Management Strategy' (2011). Cessnock DCP (2010) lists specific control relating to Aboriginal heritage in areas outside of the current study.

### 2.2.1 Lake Macquarie Aboriginal Heritage Management Strategy

Lake Macquarie (2014) LEP (Part 7, Clause 7.7) specifies recognition and conservation practices related to development within sensitive Aboriginal landscape areas, including

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*‘the consent authority may require an Aboriginal Heritage Impact Statement to be prepared before granting consent to the carrying out of development on land identified as “sensitive Aboriginal landscape area” on the Sensitive Aboriginal Landscape Area Map’*

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The study area transects a portion of land marked as sensitive on the “Sensitive Aboriginal Landscape Area Map”, which is administered under the Lake Macquarie Aboriginal Heritage Management Strategy (LMAHMS).

Under provisions outlined in the Section 6 of the LMAHMS, an Aboriginal Heritage Impact Assessment must be prepared for work to be carried out that is located within the Sensitive Aboriginal Landscape Area, and that is within 100m of a registered AHIMS site. The project satisfies both of these criteria.

Under the requirements for an Aboriginal Heritage Impact Assessment for Lake Macquarie City Council (LMCC), the current report satisfies the criteria listed in Table 6.2 (section 6.1.5 of the LMAHMS). As LMCC is one of the consent authorities for the development, this report would be forwarded to them as part of the EIS for the proposal.

### 2.3 Aboriginal Land Rights Act (1983)

The *Aboriginal Land Rights Act 1983* (the Land Rights Act) is administered by the NSW Department of Human Services – Aboriginal Affairs. The Land Rights Act established Aboriginal Land Councils (at State and Local levels). These bodies have a statutory obligation under the Land Rights Act to; (a) take action to protect the culture and heritage of Aboriginal persons in the council’s area, subject to any other law, and (b) promote awareness in the community of the culture and heritage of Aboriginal persons in the council’s area.

The study area is located within the boundaries of the Awabakal Local Aboriginal Land Council (ALALC) and the Mindaribba Local Aboriginal Land Council (MLALC). The location of the study area with respect to the boundaries of these LALCs is illustrated in Figure 2.

### 2.4 Native Title Act (1994)

The NSW *Native Title Act 1994* was introduced to work in conjunction with the Commonwealth *Native Title Act 1993*. Native Title claims, registers and Indigenous Land Use Agreements are administered under the Act.

At the time of the first site inspection (September 2016), National Native Title Tribunal records showed there were two registered claims that overlap with the study area. A third native title claim was also located within the study area; however, this claim was not registered at that time. The two claims that overlap the study area that had been registered for determination by the National Native Title Tribunal were:

- The Awabakal and Guringai People Claim (NC2013/002)

- Scott Franks and Anor on behalf of the Plains Claims of the Wonnarua People Claim (NC2013/006).

The Native Title claim that overlapped part of the study area that had not been accepted for registration is the:

- Wonnarua Traditional Custodians #3 Claim (NC2015/002).

The locations of these native title claims with respect to the study area are illustrated in Figure 3.

However, National Native Title Tribunal records in July 2017 show that there is only one remaining registered native title claim within the study area. This native title claim is:

- Scott Franks and Anor on behalf of the Plains Claims of the Wonnarua People Claim (NC2013/006).

An updated map of the overlap of Native Title areas and the project area at the drafting of this report (July 2017) is provided in Figure 4.

Figure 2: Local Aboriginal Land Council boundaries with respect to the study area

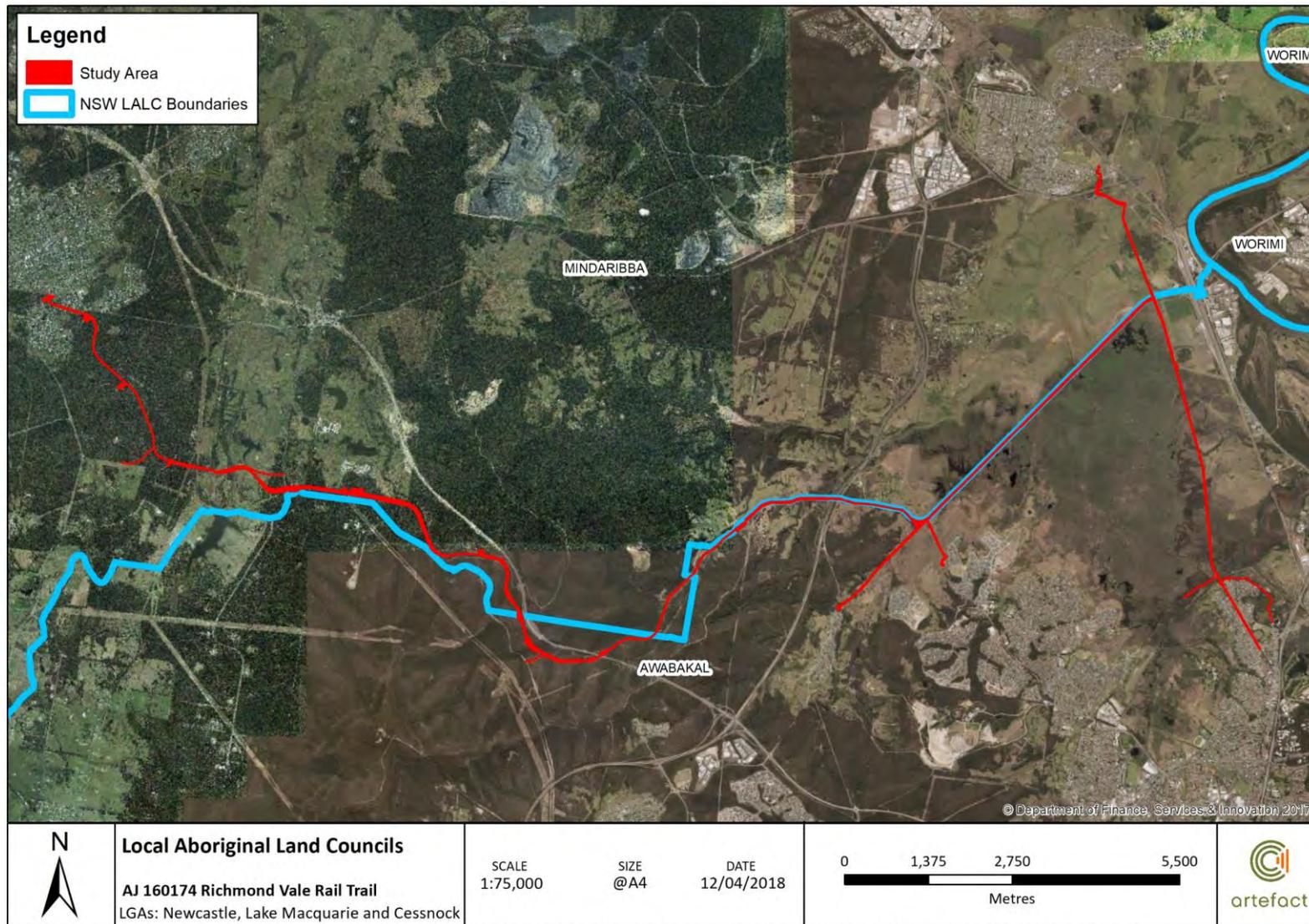


Figure 3: Native Title Claim locations and boundaries with respect to the study area, at the time the archaeological survey was conducted (September 2016)

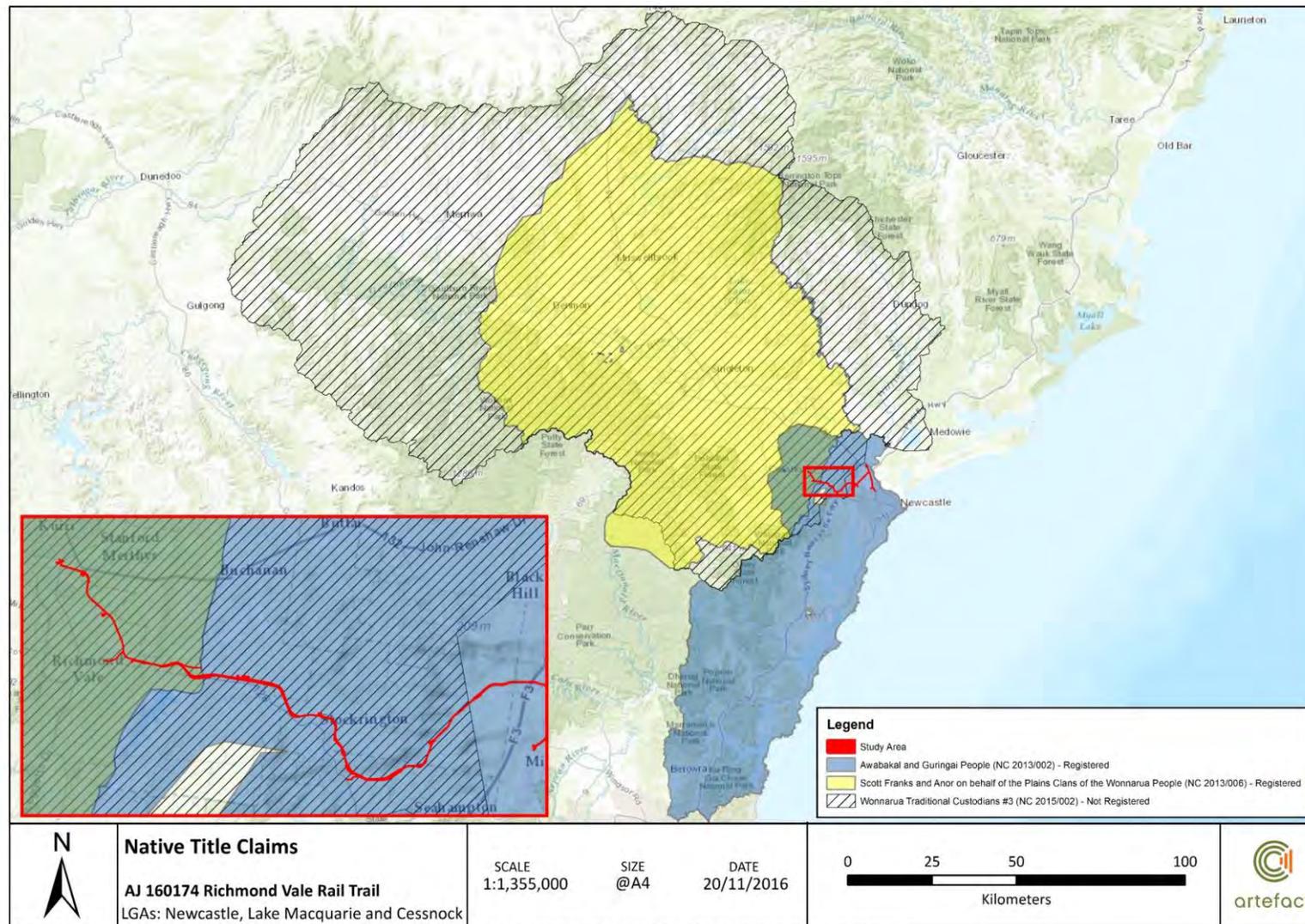
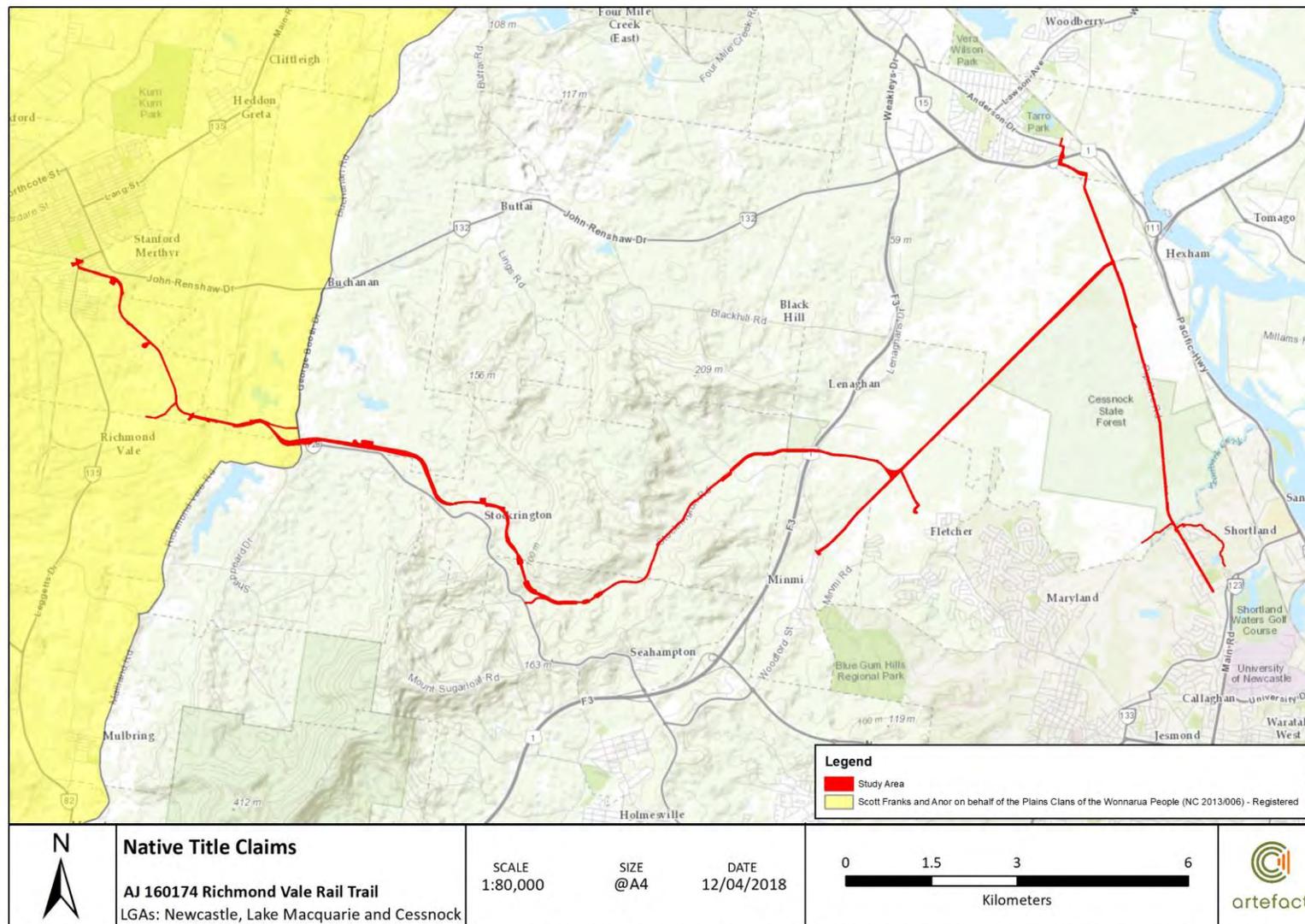


Figure 4: Native Title claims with respect to the study area, July 2017 (current January 2019)



## 3.0 STUDY AREA CONTEXT

### 3.1 Aboriginal Archaeological and Ethnohistorical Context

#### 3.1.1 Aboriginal Ethnohistorical Context

Assumptions about Aboriginal land use patterns are made on the basis of archaeological information gained from the local area, from observations made by Europeans after settlement of the area, and from information known about available natural resources. Prior to the appropriation of their land by Europeans, Aboriginal people lived in small family or clan groups that were associated with particular territories or places. It seems that territorial boundaries were fairly fluid, although details are not known.

The study area is located partly within the Awabakal language group area (Cessnock City Council 2016). The Awabakal language group extends from the Hunter River in the north, down to the south of Lake Macquarie and west as far out as the Sugarloaf Range. The name Awaba means 'flat or plain surface' in the local dialect, and the Awabakal are known as the 'people of the flat surface' (Cessnock Council 2016).

Much of the information on the Awabakal language group comes from the works of Reverend Lancelot Edward Threlkeld (Gunson 1967). Threlkeld operated an Aboriginal mission north of Lake Macquarie for 15 years and documented traditional and early Aboriginal history in the area after 1825 (Gunson 1974). Threlkeld worked for many years with a prominent Awabakal man, Biraban (meaning eagle-hawk), who had learnt to speak English while he was raised in the Military Barracks of Sydney. Together they painstakingly recorded and translated the Awabakal language into English (Umwelt 2011: 3.3). It is from Threlkeld's writings that many early accounts of the Awabakal people were recorded. At the same time, the convict artist Joseph Lycett painted representations of the Aboriginal people who lived in the Newcastle area in the early 1800s, and recorded some details of their life and community in his paintings (for an example, see Figure 5).

Aboriginal people who lived in the vicinity of the study area occupied both the coastal margin, coastal hinterland and inner mountain ranges. Threlkeld mentioned the way in which Aboriginal people would move seasonally from the coast to the mountains (Umwelt 2009). Areas of primary significance for Aboriginal people in the lower Hunter Valley included the highly food abundant Hexham Swamp, and the higher mountain crests of Mount Sugarloaf, Black Hill and the Watagans.

Hexham Swamp is a saltwater and brackish wetland which was host to large quantities of animal and plant resources which were exploited by Aboriginal people. Surrounding the wetland are numerous low hills which project into the swamp on all sides. From these raised terraces on the edge of the swamp, Aboriginal people were able to foray into the wetland to collect food and plant materials at ease.

Further inland, Mount Sugarloaf and Black Hill have been recognised as an area of strong traditional associations for the local Aboriginal people. Ceremonial sites, associated with male initiation ceremonies, have been known to be located on and near these mountains. Threlkeld also recorded that Mount Sugarloaf may also have been a burial place for important Aboriginal people and children (Kuskie 2012: 49).

Between the margin of Hexham Swamp and Mount Sugarloaf, a number of steadily steepening ridge lines are located. These ridgelines were the former transportation routes that would have led from the resource abundant Hexham Swamp fringe to the sacred dreaming and initiation sites in the Mount Sugarloaf hills (Kuskie 2012: 22).

**Figure 5: Fishing by torchlight, other Aborigines beside camp fires cooking fish, circa 1817. Joseph Lycett. Image via National Library of Australia: nla.pic-an2962715-s8**



The arrival of Europeans and subsequent settlement of the region had devastating impacts upon the local Aboriginal community's resources and way of life. Threlkeld recorded violent conflict between settlers and Aboriginal people over the stealing of corn, and described the abduction of Aboriginal women and children in the mid-1820s by runaway convicts, stockmen and other colonists.

### 3.1.2 European Settlement and Land Use

The European exploration of much of the Hunter Region including Newcastle, Lake Macquarie and Cessnock began in the late 18th century and was related to some of the first coal discoveries in New South Wales. Coal was first sighted by a party of escaped convicts led by William and Mary Bryant as they travelled along what is thought to be the Glenrock Lagoon from Port Jackson in 1791 (Lake Macquarie Industrial History, 2014).

The first official exploration of the region was led by Colonel William Paterson in June 1801. Paterson noted that the land around Newcastle contained an abundance of resources such as salt, shells (for lime), fish and coal. He also observed that low-lying land near rivers would be suitable for cultivation, while the remainder provided 'excellent pasture for cattle' (Bladen, 1896)). Upon reading Paterson's report, Governor King decided to form a settlement at the mouth of the Hunter River, setting up camp in what would later be known as Newcastle (Suters, 1997: 2). The camp was abandoned six months later, although resettlement occurred in 1804, at which time Northumberland County was formally named.

Early settlement in Cessnock and Lake Macquarie occurred in the early 1820s. The area around the Cessnock township was originally settled by pastoralists, with the main town centre at Wollombi, 31 km south west of the study area. Cessnock established itself in the late 1850s, acting as a service centre to travellers making their way to Maitland and Singleton (Cessnock City Council, 2016).

Coal deposits in the lower Hunter region were progressively identified and exploited by Europeans throughout the nineteenth century. A colliery at Minmi was established in the 1850s, which

necessitated the construction of a railway line to ship the coal to port. This was the first portion of the Richmond Vale Railway, originally called the Minmi to Hexham Railway. It was constructed in 1856 by John Eales, and linked Eales' colliery in Minmi with the Hunter River foreshore at Hexham.

The route of this original railway line skirted Hexham Swamp from Minmi along the foothills of Black Hill, before heading directly through the centre of Hexham Swamp to terminate at the Hunter River. The construction of the rail line through Hexham Swamp involved the importation of ballast, sand, ash and stone materials to build up the line above the surrounding wetland. Eales went bankrupt and his colliery and railway line was purchased by the Brown Brothers in 1859.

In 1897, the Brown brothers purchased the Richmond Vale Estate where they planned to establish a new colliery and the headquarters for their business, in addition to their collieries in Minmi and elsewhere in the Cessnock region. In order to link these collieries with the coal ports at Hexham and Newcastle, the Minmi to Hexham railway line was expanded, with work on the line being completed in 1904.

The construction of the railway line involved extensive earthworks to create a level line through the steep topography of the Sugarloaf and Black Hill ridgelines. Excavation of ground created deep cuttings through the underlying geology of the region, up to 20m deep in some places. To cross gullies and ravines, large level embankments were constructed, particularly to the north of Mount Sugarloaf.

In the early 20th century, the railway line was effective in providing transport for coal haulage in the lower Hunter area, and a number of new collieries were established near the route. With the continued expansion of coal mining in the region, large portions of the Cessnock area were used for coal mining, with significant underground excavation for deep shaft mines. Timber forests in the region were extensively felled. The towns of Kurri Kurri and Pelaw Main were established as company towns for the workers of these extensive mines.

With the expansion of the regional road networks after the Second World War, the use of the railway line began to diminish. Throughout the later twentieth century the railway line was progressively downsized as road freight was increasingly employed to haul materials throughout the lower Hunter. The railway line was finally closed in 1987 (Andrews, 2004: 109).

From the late 1990s until today, the outer suburbs of Newcastle were progressively expanded to make way for residential housing development. These developments involved the construction of new estates on the spur crests that surrounded Hexham Swamp, which had previously been largely pastoral properties.

### 3.1.3 OEH Aboriginal Heritage Information Management System (AHIMS)

**The location of Aboriginal sites is considered culturally sensitive information. It is advised that this information, including AHIMS data appearing on maps, be removed from this report if it is to enter the public domain.**

Three extensive searches of the Aboriginal Heritage Information System (AHIMS) database were conducted on 26 August 2016. An additional search was undertaken on 21 October 2016 following an extension of the study area. An area of approximately 21 kilometres (east-west) by 8 kilometres (north-south) was searched in order to gain information on the archaeological context of the study area, and to ascertain whether any previously recorded Aboriginal sites are located within the study area.

Two restricted sites were identified during the extensive AHIMS search. The locations and details of restricted sites are not publicly available. OEH was contacted for the locations of these sites, which were located outside of the study area.

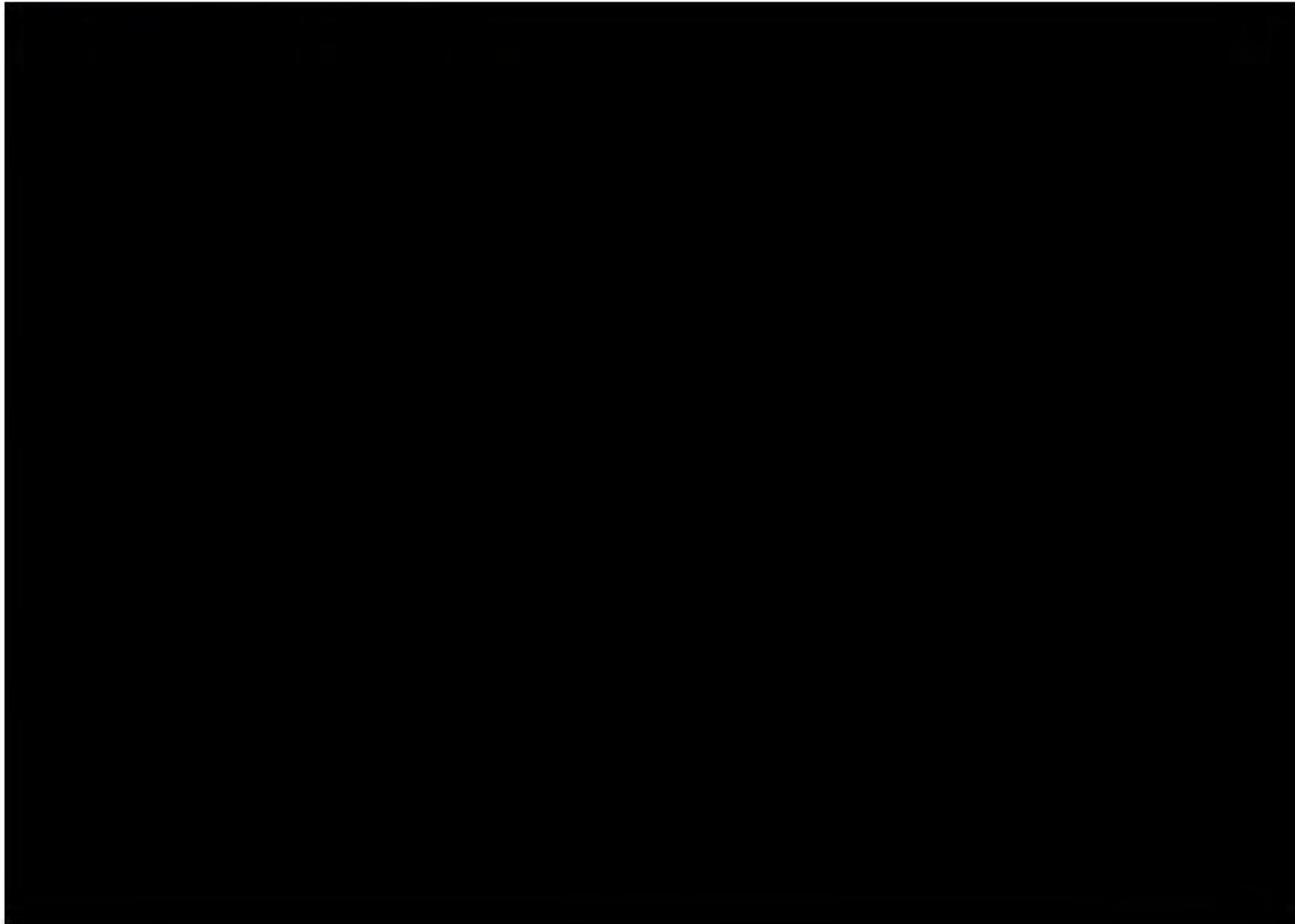
The frequency of recorded site types is summarised in Table 1 below. The distribution of recorded sites within all of the AHIMS search area is shown in Figure 6.

Updated AHIMS searches were conducted on 18 January 2019. Results of the AHIMS search were consistent with the previous AHIMS search conducted on 5 April 2018.

	<b>Search 1</b>
GDA Zone 56	[REDACTED]
Buffer	0 metres
AHIMS Search ID	393265
	<b>Search 2</b>
GDA Zone 56	[REDACTED]
Buffer	0 metres
AHIMS Search ID	393266
	<b>Search 3</b>
GDA Zone 56	[REDACTED]
Buffer	0 metres
AHIMS Search ID	393267
	<b>Search 4</b>
GDA Zone 56	[REDACTED]
Buffer	0 metres
AHIMS Search ID	393268

A description of recorded Aboriginal sites either within or in the immediate vicinity of the study area is included in Section 3.1.4 below.

Figure 6: Results of AHIMS searches for the study area



### 3.1.4 Recorded Aboriginal Sites Located Within the Study Area

AHIMS searches prior to the archaeological survey for this project identified three recorded Aboriginal sites within the study area. The sites are outlined in Table 2.

**Table 2: AHIMS registered sites located within, or in the immediate vicinity of, the study area**

Site Name	AHIMS no.
Hexham Swamp 2A (HS2A)	38-4-1583
Blue Gum Creek RTA 4 IF	38-4-1348
Blue Gum Creek Artefact Scatter 2	38-4-0761

**HS2A, AHIMS # 38-4-1583** is located [REDACTED]. The site was recorded in 2012 as part of investigations of the Hexham Relief Road project. Test excavation works were carried out as part of the Hexham Relief Roads Project. The site consists of three artefacts, including an IMT backed blade, a chert retouched flake and a Fine Grained Siliceous flake. The artefacts were retrieved from two test pits in a disturbed context, and were documented as likely to represent a background archaeological signal in the local area. The site was designated as demonstrating low archaeological sensitivity.

**Blue Gum Creek RTA 4 IF, AHIMS # 38-4-1348** is located [REDACTED]. The site was recorded in 2010 as part of investigations for the Hunter Expressway project. The site consists of an isolated artefact located on a gently sloping ridge line. The site is situated [REDACTED] and consists of a silcrete broken flake. The site is defined by surface artefact distribution (1 metre square) on a vehicle track with 85% visibility. The site has been impacted by vegetation clearing, vehicle track construction and use, and erosion. The disturbances have resulted in the exposure of the A2 and B soil horizons. The site is in poor condition with low archaeological integrity and low potential for subsurface archaeological material in the surrounding landscape due to the high levels of vehicle disturbance and erosion.

**Blue Gum Creek 2 Artefact Scatter, AHIMS # 38-4-0761** is located [REDACTED]. The site was recorded in 2003 as part of investigations for the proposed extension of the F3 to Branxton. The original site record noted that four artefacts were located [REDACTED]. The tracks are extremely eroded (down to clay in many areas) and highly disturbed from works associated with the tracks and the railway. Off road the soil is skeletal and very rocky. The artefacts are associated with two almost level benches on the midslope landform context above Blue Gum Creek.

An updated AHIMS search completed in April 2018 identified the above three recorded Aboriginal sites, plus 17 Aboriginal sites identified during archaeological field survey for the current assessment. Detailed information on those 17 sites is outlined in Section 6 of this report. The 17 Aboriginal sites recorded for the current assessment have each been entered into the AHIMS database twice. These are each duplicate recordings of the same Aboriginal site.

The Office of Environment and Heritage were contacted on 29 May 2018 to remove duplicate entries of listed sites on the AHIMS register. However, as AHIMS sites cannot be formally removed from the register, a number of sites had their "Site Status" amended to "Not a Site" on their formal listing. As

the amended sites are still listed on the AHIMS register they have been included in all mapping and discussion in this report.

Duplicate sites which were listed as “Not a Site” are tabulated in Table 3 below. Table 3 also provides the correct site AHIMS code for each site.

**Table 3: Duplicate AHIMS registered sites listed as “Not a Site”, with correct AHIMS identifier**

Duplicate AHIMS site identifier	Site name	Site Status	Correct AHIMS site identifier
37-6-3832	Richmond Vale Rail Trail Isolated Find 10 (RVRT IF10)	Not a Site	37-6-3808
37-6-3833	Richmond Vale Rail Trail Isolated Find 9 (RVRT IF9)	Not a Site	37-6-3807
37-6-3834	Richmond Vale Rail Trail Isolated Find 8 (RVRT IF8)	Not a Site	37-6-3806
38-4-1880	RVRT AS7	Not a Site	38-4-1923
38-4-1882	RVRT IF2	Not a Site	38-4-1910
38-4-1884	RVRT IF4	Not a Site	38-4-1913
38-4-1910	Richmond Vale Rail Trail Isolated Find 2	Not a Site	38-4-1882
38-4-1911	Richmond Vale Rail Trail Isolated Find 6 (RVRT IF 6)	Not a Site	38-4-1886
38-4-1912	Richmond Vale Rail Trail Artefact Scatter 5 (RVRT AS 5)	Not a Site	38-4-1878
38-4-1913	Richmond Vale Rail Trail Isolated Find 4 (RVRT IF4)	Not a Site	38-4-1884
38-4-1915	Richmond Vale Rail Trail Artefact Scatter 4 (RVRT AS 4)	Not a Site	38-4-1877
38-4-1916	Richmond Vale Rail Trail Artefact Scatter 6 (RVRT AS 6)	Not a Site	38-4-1879
38-4-1917	Richmond Vale Rail Trail Artefact Scatter 3 (RVRT AS3)	Not a Site	38-4-1876
38-4-1918	Richmond Vale Rail Trail Artefact Scatter 2	Not a Site	38-4-1875
38-4-1919	Richmond Vale Rail Trail Artefact Scatter 1	Not a Site	38-4-1874
38-4-1920	Richmond Vale Rail Trail Isolated Find 1	Not a Site	38-4-1881
38-4-1921	Richmond Vale Rail Trail Isolated Find 7 (RVRT IF7)	Not a Site	38-4-1887
38-4-1922	Richmond Vale Rail Trail Isolated Find 3 (RVRT IF3)	Not a Site	38-4-1883
38-4-1924	Richmond Vale Rail Trail Isolated Find 5 (RVRT IF 5)	Not a Site	38-4-1885

The study area boundaries have changed since the original field survey such that an additional two sites registered on AHIMS following the current investigation, AHIMS ID 38-4-1922 and 38-4-1924, are no longer within the study area.

### 3.1.5 AHIMS Sites Located within 200m of the Study Area

There are 22 recorded Aboriginal sites located within 200m of the study area. These sites are outlined in Table 4.

These sites were not visited for this assessment, and as such, the site description information outlined in Table 3 is from information provided on the OEH AHIMS site recording forms for each site.

Table 4: AHIMS registered sites located within 200m of the study area

Site Name	AHIMS no.	
CTGM 1/A	38-4-1056	<b>CTGM 1/A, AHIMS # 38-4-1056</b> is located [REDACTED]. The site consists of an isolated brown silcrete flake, located in a gravel exposure on an unsealed portion of a vehicle track that runs adjacent to the pipeline. The site is located [REDACTED]. Information on the AHIMS site card states that site has been extensively disturbed through the construction of the existing pipeline, vehicle track, vegetation removal, gravel deposition and erosion, and that there is minimal potential for an in-situ sub-surface deposit. The site has been designated culturally important by ALALC.
CTGM 1/B	38-4-1055	<b>CTGM 1/B, AHIMS # 38-4-1055</b> is located [REDACTED]. The site is located within an area that has been completely cleared of native vegetation. The local rock type is Tomago Coal Measures. The site consists of an isolated brown tuff flake [REDACTED]. Information on the AHIMS site card states that the site has been extensively disturbed through the construction of the existing pipeline, road construction, drainage control, vegetation removal, gravel deposition and erosion. The site has been designated culturally important by ALALC.
Tarro	38-4-0325	<b>Tarro, AHIMS # 38-4-0325</b> is located [REDACTED]. The site is located [REDACTED]. The local rock type consists of sandstone. The site consists of an artefact scatter, two artefacts were located in an exposure on an embankment, with a further flake located 100 metres away near the tree line in the wetland.
Hexham Swamp (HS) 1	34-4-1588	<b>HS1 (Hexham Swamp 1), AHIMS # 38-4-1478</b> is located [REDACTED]. [REDACTED] was originally recorded in 2011. The site was investigated as part of the AMBS Hexham Relief Roads Project, Aboriginal Heritage Impact Assessment. Information on the AHIMS site card states that the site has been subject to damage related to the construction of gravel embankments to create access roads. The site consists of substantial evidence of Aboriginal heritage, the extent of which was not able to be fully recorded during survey. Many artefacts had

Site Name	AHIMS no.	
		<p>been damaged by vehicles or machinery. Several types of stone were noted, predominantly chert/MTC. AMBS determined there was evidence of substantial Aboriginal heritage material below the surface in this area on the margins of the swamp, and other areas in a similar landform should be considered archaeologically sensitive.</p> <p>The site was re-recorded in 2012 by AMBS. It was noted that although there is an Aboriginal silcrete quarry nearby the area, none of the artefacts were made of silcrete. No artefactual material was identified on adjacent access tracks. AMBS determined the artefactual material is confined to the one track and that the artefacts have been brought to the area during the construction of the track, and is not indicative of the local Aboriginal archaeology. The artefactual material <u>located in 2011 was spread over a low-lying alluvial plain and</u> appears to be the result of vehicles crossing the disused track, and unlikely to be associated with the site HS1. The site is considered not to have archaeological sensitivity or be associated with a PAD. This was confirmed by AMBS' October 2012 test excavations.</p>
Lenaghans AS2	38-4-1378	<p><b>Lenaghans AS2, AHIMS # 38-4-1378</b> is located at [REDACTED]. The artefact scatter was originally identified by an ALALC representative in a cleared, pastoral area on lower/midslopes. The site contains at least two artefacts, one silcrete and one chert flake.</p>
Sanctuary Estate Stage4b Fletcher NSW	38-4-1519	<p><b>Sanctuary Estate Stage 4b Fletcher NSW</b> does not have a site card available for this site. Information on this site is limited however it is located in an area of likely high archaeological sensitivity. More information on this site and the surrounding Aboriginal archaeological context is provided in Section 6.</p>
Minmi Road	38-4-0070	<p><b>Minmi Road, AHIMS # 38-4-0070</b> is located [REDACTED]. The site consists of a scatter of sparse artefacts along the shoulder of the ridge. Extensive vegetation clearance has been undertaken for pastoral purposes.</p>
Blue Gum Creek RTA 8 ST	38-4-1346	<p><b>Blue Gum Creek RTA 8 ST, AHIMS # 38-4-1346</b> is located [REDACTED]. The site consists of a modified tree located [REDACTED]. Information on the AHIMS site card states that the tree was</p>

Site Name	AHIMS no.	
		<p>approximately 90 to 125 years old when it died, and has been dead for up to 80 years. The tree has two Aboriginal cultural scars, including a ring bark style indicating a post WWI process with a methodical double ring tomahawk cut. The top portion of the tree was likely cut by chainsaw around the 1960s. The site was assessed as having low Aboriginal cultural significance and low archaeological significance.</p>
Blue Gum Creek RTA 9	38-4-1352	<p><b>Blue Gum Creek RTA 9, AHIMS # 38-4-1352</b> is located [REDACTED] [REDACTED] [REDACTED]. The site is situated [REDACTED] [REDACTED] and consists of 28 artefacts made from tuff, chert and silcrete. Information on the AHIMS site card states that the site has been impacted by tree clearing, vehicle disturbance and associated erosion, resulting in the exposure of the A2 soil horizon. The site is in poor condition with low archaeological integrity and low potential for subsurface archaeological material in the surrounding landscape due to the high levels of vehicle disturbance and erosion.</p>
Blue Gum Creek RTA 5	38-4-1349	<p><b>Blue Gum Creek RTA 5, AHIMS # 38-4-1349</b> is located [REDACTED] [REDACTED]. The site consists of an artefact scatter located on [REDACTED] [REDACTED]. The site consists of two tuff broken flakes, both heavily burnt. Information on the AHIMS site card states that the site has been impacted by vegetation clearing, vehicle disturbance and erosion that has resulted in the exposure of the A2 and B soil horizons. The site is in poor condition with low archaeological integrity due to soil profile disturbance and loss of soil within the site. There is low potential for subsurface archaeological material.</p>
Blue Gum Creek RTA 6 IF	38-4-1350	<p><b>Blue Gum Creek RTA 6 IF, AHIMS # 38-4-1350</b> is located [REDACTED] [REDACTED] [REDACTED] site consists of one tuff broken flake. The site is located [REDACTED] [REDACTED]. The disturbances have resulted in the exposure of the A2 and B soil horizons. Information on the AHIMS site card states that the site is in poor condition with low archaeological integrity and low potential for subsurface archaeological material in the surrounding landscape due to the high levels of vehicle disturbance and erosion.</p>

Site Name	AHIMS no.	
Blue Gum Creek RTA 10 IF	38-4-1353	<b>Blue Gum Creek RTA 10 IF, AHIMS # 38-4-1353</b> is located [REDACTED] [REDACTED] The site consists of one tuff core [REDACTED] The site has been impacted by tree clearing, vehicle disturbance and associated erosion, resulting in the exposure of the A2 soil horizon. Information on the AHIMS site card states that the site is in poor condition with low archaeological integrity and low potential for subsurface archaeological material in the surrounding landscape.
Blue Gum Creek (Grinding Groove)	38-4-0222	<b>Blue Gum Creek (Grinding Groove), AHIMS # 38-4-0222</b> is located [REDACTED] [REDACTED] The site consists of grinding grooves located [REDACTED]. The grinding grooves are scattered over an area of approximately 20 metres <sup>2</sup> . Information on the AHIMS site card states that the condition of the site is weathered.
Blue Gum Creek RTA 7	38-4-1351	<b>Blue Gum Creek RTA 7, AHIMS # 38-4-1351</b> is located [REDACTED] [REDACTED] The site consists of a scatter of six oyster shell fragments. The site has been impacted by vegetation clearing, vehicle disturbance and erosion resulting in the exposure of the A2 and B soil horizons. Information on the AHIMS site card states that the site is in poor condition with low archaeological integrity and low potential for subsurface archaeological material in the surrounding landscape.
Blue Gum Creek 1 Artefact Scatter	38-4-0760	<b>Blue Gum Creek 1 Artefact Scatter, AHIMS # 38-4-0760</b> is located [REDACTED] [REDACTED] Two flakes, including a broken, retouched flake made from Nobbys tuff and a broken basalt flake, are located on the midslopes of a dirt track. Both artefacts have been burnt. The artefacts are not thought to be in-situ, as they are likely to have been washed down the access road from a site (AHIMS # 38-4-0761) on a level area at the top of slope. The road is extremely eroded with the B horizon and sandstone exposed in some areas. [REDACTED] [REDACTED]
Blue Gum Creek 4 Artefact Scatter and associated PAD	38-4-0763	<b>Blue Gum Creek 4 Artefact Scatter and Associated PAD, AHIMS # 38-4-0763</b> is [REDACTED] [REDACTED] Three

Site Name	AHIMS no.	
		<p>Nobbys retouched tuff flakes were located [REDACTED] [REDACTED] A level bench was located adjacent to one of the artefacts and above two of the artefacts. An area of PAD was identified on this bench. The track leading down to Blue Gum Creek crosses the lower slope in this area, before increasing again. At this point the creek has a cavernous overhang suitable for Aboriginal occupation, however, no evidence of Aboriginal occupation was observed. The area was identified as highly sensitive by the Awabakal representative on site.</p>
Blue Gum Creek Grinding Grooves	38-4-0235	<p><b>Blue Gum Creek Grinding Grooves, AHIMS # 38-4-0235</b> is located [REDACTED] [REDACTED] The local rock type is sandstone, and the local land is used for coal mining activities. Blue Gum Creek is the source of drinking water.</p>
Blue Gum Creek Grinding Grooves	38-4-0236	<p><b>Blue Gum Creek Grinding Grooves, AHIMS # 38-4-0236</b> is located [REDACTED] [REDACTED] The site consists of 6 grinding grooves located in the creek bed.</p>
Blue Gum Creek 3 Isolated Find	38-4-0762	<p><b>Blue Gum Creek 3 Isolated Find, AHIMS # 38-4-0762</b> is located [REDACTED] [REDACTED] The site consists of one Nobbys tuff flake, broken in two pieces. The site was located [REDACTED] [REDACTED] The general area has been highly disturbed by works associated with levelling and building up the ground surface for the railway, pit-propping activities and road grading. It was determined unlikely that further artefacts would be present in a subsurface context.</p>
Surveyors Creek RTA 11 (Previously PAD 6 Surveyors Creek)	38-4-0826	<p><b>Surveyors Creek RTA 11 (Previously PAD6 Surveyors Creek), AHIMS # 38-4-0826</b> is located [REDACTED] [REDACTED] Sandstone outcrops are located in the creek bed. There are limited alluvial deposits along the banks of the creek. A level area adjacent to the creek was determined suitable for a camp site. Visibility was zero due to</p>

Site Name	AHIMS no.	
		vegetation.
Surveyors Creek RTA 4	38-4-0808	<p><b>Surveyors Creek RTA 4, AHIMS # 38-4-0808</b> is located [REDACTED].</p> <p>Five artefacts were located [REDACTED]. Four of the artefacts were in situ, eroding out of the bank at approximately 10 centimetres' depth. One artefact was located sitting on the aggraded sandy soil, 20 metres east of the watercourse having washing down from above. The artefacts consisted of 2 silcrete flaked pieces, 1 silcrete flake, 1 mudstone broken flake and 1 mudstone heat shatter. Soils consisted of grey sandy loam with pebbles from conglomerate below the loam. The area is highly disturbed from scouring and vehicle access. An area on the western bank was determined to contain potential archaeological deposits in a stratified context.</p>
Surveyors Creek RTA 3 IF	38-4-0807	<p><b>Surveyors Creek RTA 3 IF, AHIMS # 38-4-0807</b> is located [REDACTED].</p> <p>An isolated broken silcrete flake was located in an area of exposure on a lower slope. The nearest water source in relation to the site was Surveyors Creek, 150 metres north east. Visibility in the surrounding area was restricted due to vegetation cover and leaf litter. The artefact may have been excavated when a hole for a nearby surveyors peg was dug. The area is disturbed and in poor condition due to clearing of the forest.</p>
Surveyors Creek RTA 24	38-4-1611	<p><b>Surveyors Creek RTA 24, AHIMS # 38-4-1611</b> is located [REDACTED].</p> <p>The site consists of two artefacts, a mudstone flake and a silcrete flake, located [REDACTED].</p> <p>[REDACTED] track is currently used as access for the Kurri Kurri Motorcycle Club. It is likely that the artefacts have eroded from the track edges which are slightly lower than surrounding landform. Very little or no A1 or A2 horizon soils remain on the track, with only a lag deposit of gravel resting on the clay B horizon surface in most parts. The site is in poor condition with no archaeological integrity remaining.</p>

### 3.1.6 Previous Archaeological Investigations

#### **AMBS (2012) Hexham Relief Roads Project: Aboriginal Heritage Impact Assessment**

Australian Museum Business Services (AMBS) was commissioned by KMH Environmental (KMH) to prepare an Aboriginal Heritage Impact Assessment (AHIA) addressing potential impacts to Aboriginal heritage in relation to the Hexham Relief Roads Project.

An archaeological survey of the area determined the project would have an impact on two Aboriginal sites/PADs: HS1 (AHIMS # 38-4-1478), [REDACTED]

[REDACTED] The second site, Cultural PAD, consisted of a potential subsurface archaeological deposit recorded by McCardle Cultural Heritage (MCH). The survey also identified a rise of land on the north-eastern side of the intersection of Woodlands Close and the New England Highway as having some potential for subsurface deposit, although not part of the proposed impacts related to the relief roads, the area was specified as an area to avoid any inadvertent impacts. A rounded stone and some shell material were also located in fill material near the southern end of the relief roads area.

The report recommended an Aboriginal Heritage Management Plan (AHMP) for the project be developed, as well as a program of archaeological test and salvage excavation in any section of site HS1 and the Cultural PAD.

#### **AMBS (2013) Hexham Relief Roads Project: Test Excavation Report**

AMBS was commissioned by KMH on behalf of Upper Hunter Valley Alliance (UHVA) to undertake archaeological test excavations associated with the Hexham Relief Roads Project.

Previously identified Aboriginal site HS1 was found to extend [REDACTED] [REDACTED] The site is believed to comprise artefactual stone material that has been brought to the area during the construction of the track, and is not indicative of the local Aboriginal archaeology. The artefactual material previously identified was believed to have been spread across the low-lying alluvial plain, possibly by vehicles using the disused track.

A Cultural PAD had been identified by MCH, based on an apparent lack of disturbance and the importance of the area to registered Aboriginal stakeholders. However, access to the entirety of the Cultural PAD was unable to be obtained prior to test excavations and was therefore postponed. The shell material was considered likely to have been introduced in fill, possibly brought in with dredged sand and is not considered to be representative of the local Aboriginal archaeology or associated with HS1.

Test excavation identified subsurface Aboriginal archaeological deposits comprising three stone artefacts, located in two adjacent test pits along the access road, approximately 160-180 metres from Purgatory Creek. These artefacts were recovered from disturbed contexts, and are likely to represent 'background archaeology of the local area, rather than long term cultural activities that would result in extensive in situ archaeological sites' (AMBS 2013: IV). This material was not considered to be associated with HS1, and was therefore designated as Aboriginal site HS2.

### **JCIS Consultants (2014) Report on Archaeological Monitoring of Vegetation Clearing and Geotechnical Testing – Hexham Relief Roads Project**

The Hexham Relief Roads project involves the construction of five new relief roads (rail tracks) of approximately two kilometres, and their associated infrastructure, adjacent to the existing tracks near Hexham Railway Station.

### **Mills Archaeological and Heritage Services Pty Ltd (2003)**

Monteath and Powys Pty Ltd commissioned Robyn Mills to conduct an archaeological assessment of an area of land at 290 and 302, Minmi Road Fletcher. This area of land was the subject of a rezoning application to City of Newcastle Council for residential development and is located approximately 1.1 kilometres south of the eastern portion of the current study area.

At the time of the field assessment, visibility across the survey area was generally less than 1%, however at all locations where visibility was greater than 30% sites were located. The survey identified four sites

- MR-OS-1: located [REDACTED] Sixteen artefacts were recorded. This site was assessed as having low scientific significance as a result of the extreme disturbance the site had suffered.
- MR-OS-2 and PAD1: [REDACTED] The site was visible over an area of exposure 10 metres x 5 metres. A total of six surface artefacts were recorded. It was determined that there was a high potential for archaeological deposit to be present on the adjacent elevated terrace, which was identified as PAD1.
- MR-OS-3: [REDACTED] Three artefacts were recorded in a highly disturbed context.
- MR-OS-4: [REDACTED] approximately 800 metres east of MR-OS-1. Six artefacts were recorded.

Crests and shoulders of spur lines in the vicinity of Hexham Swamp and lower terraces immediately adjacent to Hexham Swamp were identified as having potentially high archaeological sensitivity within the study area. A program of subsurface testing was recommended, with a focus on these highly sensitive landforms.

### **ERM (2003) Aboriginal Archaeology Retrieval Excavation – Hunter Employment Zone, Cessnock NSW. Test Excavation Report**

Environmental Resources Management (Australia) Pty Ltd (ERM) were commissioned by Cessnock City Council to undertake the initial stages of an Aboriginal Archaeological Retrieval Excavation archaeological salvage program required by National Parks and Wildlife Service and specified in the LEP covering the Hunter Employment Zone land at Kurri Kurri. The study area is located approximately 2 kilometres west of the current study area.

Excavation throughout the sand sheets surrounding Kurri Kurri showed that Aboriginal objects were commonly located throughout the landscape. The homogeneity of the sand sheet was also established, to sometimes over 1m in depth. Artefacts were sometimes recovered from up to 1.2m depth in these sand sheets as well.

However, artefact concentrations and densities in the sand sheet were relatively low throughout the testing area, especially at depth.

## 3.2 Landscape Context

### 3.2.1 Introduction

Due to the large size of the study area, and the number of different landforms, geological and soil regimes, watersheds and natural resource systems that the study area passes through, this section provides an overall summary of the Proposal's environmental context. A localised discussion of the environment along the route is presented in the survey results in Section 5.0.

In this section, an overview of four of the main landscape regions present in the study area is provided.

### 3.2.2 Hexham Swamp

Hexham Swamp is a large wetland which is located between the Hunter River in the east and the lower foothills of Black Hill and Sugarloaf Mountain in the west. It is a majority salt-water estuarine landscape, predominantly drained by Ironbark Creek into the Hunter River. Inside the swamp, Quaternary estuarine sediments (clays and silts) dominate. Vegetation in this area is largely mangrove and salt-tolerant species in the lower tidal zone of the wetland, with less salt-tolerant reed and grass species located further inland in the more freshwater portions of the swamp. The wetlands are host to a large variety of fish, bird and other animal species.

Due to severe flood events during the mid-20th century, flood weirs were constructed on Ironbark and other creeks, to control the degree of flooding and water which was channelled through the swamp. This had the result of drying out significant areas of the wetland, with subsequent failures in the wetland ecosystem. These flood gates were permanently removed in 2013 in an attempt to restore the ecological integrity of the wetland system.

Numerous low-lying spur crests extend into Hexham Swamp on its southern, western and northern margins. These hills are largely composed of Beresfield soil landscapes, a residual soil forming out of the parent shales and conglomerates of the underlying Tomago Coal Measures. These hills have gentle to moderate slope gradients and up to 50m relief above the surrounding terrain.

### 3.2.3 Sugarloaf Mountain and Black Hill Foothills

Mount Sugarloaf (412m ASL) and the nearby Black Hill to the north, are low elevation mountains which provide high vantage points over the Newcastle and Lake Macquarie coastlines, as well as over the central Hunter River plain to the north and west. These mountain ranges are connected to each other, and to ranges to the southwest, by elevated ridge lines which traverse steep gullies and creek banks.

The terrain in this part of the study area is characterised by moderate to steep hill slopes, with two east-west orientated ridge lines which rise from the lower Hexham Swamp hill margins from the east. Soil landscapes in the area predominantly consist of colluvial soils which are highly erodible depending on the degree of slope in the local area. These soils overly the shales, conglomerates and sandstones of the underlying Newcastle Coal Measures. There are frequent sandstone outcrops within this area.

Water sources in this region consist of freshwater creeks through the gullies which lie between the ridgelines, fed by numerous ephemeral drainage channels from the surrounding higher slopes. Due to the long history of European coal mining in the area, much of the original old growth eucalypt forest has been removed. Today much of the region is covered in regrowth eucalypt forest.

### 3.2.4 Wallis Creek Valley

Wallis Creek is a north-flowing creek which extends from the northern slopes of the Watagan ranges in the south, following a course west of Sugarloaf Mountain before discharging in the Hunter River near the town of Maitland. The portion of Wallis Creek which extends through the study area is located in a low-lying plain, bounded by the western foothills of Mount Sugarloaf on the east and by the gently sloped rise towards the Kurri Kurri sands in the west.

The relatively flat portion of the Wallis Creek plain in the study area consists of alluvial sandy loam soils which have been deposited by the periodically flooding creek that runs through the valley. Former meander and billabongs of the creek are present in this area, with areas of small rises in between creek channels. A large human-made dam, the Colliery Dam, is located south of the study area, which has reduced Wallis Creek's potential for frequent and damaging floods since its construction.

The Wallis Creek valley today has been cleared of native vegetation and has been almost entirely employed for cattle pasturage. Pasture grasses and low-level eucalypt regrowth is present in the area. Casuarina and other wetland species are present along the creek margins.

### 3.2.5 Kurri Kurri Sand Sheets

Large areas of Neath and Heddon Greta sandy soil landscapes predominate south of Kurri Kurri. These sand sheets can extend up to 1.2m deep, and overlie the predominantly conglomerate and shale of the Maitland Group geological formation of mudstone, sandstone and conglomerates.

This portion of the study area has been associated with coal mining since the late 19th century. The area through which the former railway line traverses is now a thickly revegetated State Conservation Area (SCA), consisting of open eucalypt forest with dense understory. The conservation area is abundant in bird and animal species.

Freshwater courses are located throughout this portion of the study area, originating in springs and pooling in wetland sumps that are located in the sandy landscape. These water courses drain into Wallis Creek to the north of the study area, south of Maitland.

## 3.3 Predictions

Archaeological data gathered in the locality suggests that artefact sites are often located on elevated areas that border wetlands. Artefacts are found across the landscape in varying densities, with higher densities expected in close proximity to Hexham Swamp, and along ridge crests and saddles that lead up to Mount Sugarloaf.

The main limitations to the survival of archaeological material in the study area are related to ground disturbance associated with the railway infrastructure that the shared pathway route largely follows. It would not generally be expected to identify intact archaeological sites within the former railway corridor, due to the high degree of ground excavation, especially in cuttings, and imported material in order to lay a level rail line for steam locomotives.

Based on information from the OEH AHIMS site register search, previous archaeological investigations in the local area, landscape and regional context, the most likely site types to occur within the study area include:

**Artefact sites:** Open artefact sites and areas of PAD may occur in areas not subject to high levels of erosion or modern disturbance. The most common stone artefact material from previous archaeological studies include Indurated Mudstone/Tuff (IMT), silcrete or quartz.

## 4.0 SURVEY METHODOLOGY

Archaeological survey of the study area was conducted in accordance with the OEH Code of Practice over 5 days between 12 and 16 September 2016. All transects were surveyed on foot. The survey was undertaken by Duncan Jones, Adele Zubrzycka (Heritage Consultants, Artefact Heritage), Peter Townsend (ALALC), Jason Brown (MLALC) and Peter Leven (Awabakal and Guringai People Native Title claimant).

An additional pedestrian survey of Survey Unit 2 and Survey Unit 16 was conducted on 10 May 2017 by Duncan Jones and Adele Zubrzycka.

The study area is predominantly a linear route defined by the former alignment of the Richmond Vale Railway. This study area consists of both the rail line itself (where the majority of the shared path construction is to take place) and an area of variable width surrounding the former railway where ground disturbing works may be conducted, such as potential lay down areas and construction access routes.

For the purposes of the archaeological survey, the study area was divided into fifteen separate survey units. These survey units are sequentially numbered one through fifteen between the south eastern commencement of the rail trail to its final western termination in Pelaw Main. The location of these survey units is illustrated in Figure 7.

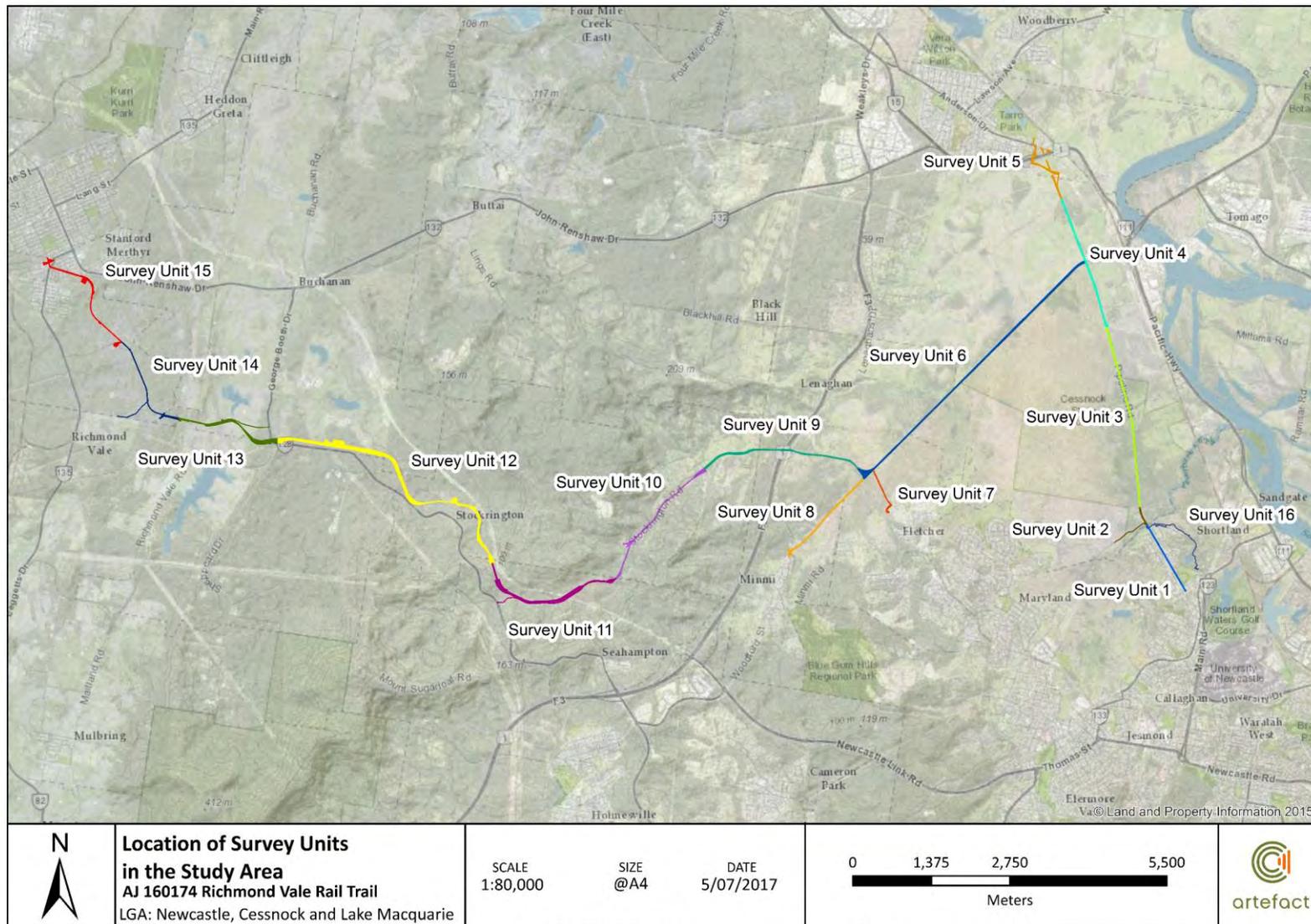
A handheld non-differential Global Positioning System (GPS) was used to track the path of the survey team and record the coordinates of survey transects, including the locations of sandstone outcrops and platforms within the study area, as well as the location of Aboriginal sites. Detailed aerial maps marked with grid coordinates for each of the fifteen survey units were carried by each member of the survey team in the field. The coordinate system projection used for all site recording was GDA94 MGA 56.

All ground exposures were examined for Aboriginal objects (stone artefacts, imported shell, or other traces of Aboriginal occupation). Any identified old growth trees were examined for signs of cultural scarring and marking. All accessible and undisturbed sandstone outcrops, platforms and overhangs were examined for cultural marking (rock art features), such as grinding grooves and engravings. Areas of undisturbed ground located near Hexham Swamp, near freshwater courses or on low-gradient hillslopes and crests were examined for evidence of archaeological potential.

A photographic record was kept of the area within each of the fifteen survey units. Photographs were taken to record aspects of survey units including ground exposures, water courses, vegetation, artificial embankments and cuttings, and other types of ground disturbance. Photographs of recorded and identified Aboriginal sites were made. Scales were used for photographs where appropriate.

All survey units were comprehensively surveyed, except for small portions of these areas that were inaccessible. Areas which were inaccessible predominantly consisted of areas associated with extensive modern disturbance caused by the construction of the 19th and early 20th century railway line, principally steep sandstone railway cuttings. A description of areas that were inaccessible during the survey is included below in the description of each survey unit.

Figure 7: Location of survey units within the study area



## 5.0 SURVEY RESULTS

### 5.1 Survey Unit 1

#### 5.1.1 Location and Description

Survey Unit 1 is located on the central ridge-line in Shortland and runs south-east to north-west with a moderate slope at its northern end where it approaches Ironbark Creek (Figure 9). The study area is bounded by private properties to the west, Marton Street to the south, a grass verge and road reserve of King Street to the east and by Ironbark Creek in the north.

The majority of the survey unit adjacent to King Street is a grassed road-side verge, and was formerly the location of a Hunter Water pipeline which was removed in 2010. The northern portion of the survey unit descends to the bank of Ironbark Creek via the former Hunter Water pipeline easement. It is surrounded by pastoral properties to the west (Figure 10) and residential properties to the east (Figure 11).

#### 5.1.2 Environmental Context

The survey unit is located on a ridge crest landform in Shortland, a gentle low-lying hill which projects into Hexham Swamp to the north. This ridge line is roughly orientated north-west to south-east, with the Hexham Swamp surrounding it to the west, north and east. The soil in this area consists of Beresfield residual soils, degrading from underlying parent bedrock mudstone and shale of the Tomago coal measures. Much of the upper profile of these soils consists of light brown sandy loam. The nearest natural water courses are Ironbark Creek, Crawchie Creek and Boatman's Creek, located in the surrounding low-lying Hexham Swamp.

#### 5.1.3 Ground Visibility and Disturbance

The eastern portion of the survey unit between Marton Street and the King Street / King Trail junction is a grassed road verge with ground exposures located frequently along the road margin. Areas around planted trees (Figure 12) and the path of an informal pedestrian walkway had high surface visibility.

A low wooden fence is located in the centre of this survey unit for the extent of the area adjacent to King Street. The former pipeline is located west of this wooden fence, and was constructed on a minor artificial embankment (Figure 13). The western portion of the survey unit had limited ground visibility compared to the eastern portion closer to King Street (Figure 14).

North of the King Street / King Trail junction, the area was heavily grassed, with no areas of exposed ground. The northern extent of the study area terminated in an intertidal mudflat on the banks of Ironbark Creek (Figure 15).

Stormwater drains and water service utilities were apparent in the centre of the survey unit. Several culverts were located in the survey unit, crossing east the line of the RVRT route. Telecommunication and electrical services were identified immediately to the east of the survey unit, directly abutting King Street.

The edge of the hillcrest at the commencement of the descent to Ironbark Creek showed signs of land modification and disturbance, as a result of construction of both the former rail line and subsequent Hunter Water pipeline. The banks of Ironbark Creek showed minor signs of disturbance and sediment resettling from the former Ironbark Creek bridge.

**Figure 8: Shortland hill crest, south aspect**



**Figure 9: Moderately sloped embankment away from Ironbark Creek, north aspect**



**Figure 10: Pastoral properties to the west of the survey unit, north aspect**



**Figure 11: Residential dwellings in the vicinity of the survey unit, east aspect**



**Figure 12: Exposures near trees in road verge, west aspect**



**Figure 13: Artificial embankment from the former Hunter Water pipeline, south aspect**



**Figure 14: Grassed area of survey unit, north aspect**



**Figure 15: Intertidal margin of Ironbark Creek, north west aspect**



#### 5.1.4 Aboriginal Sites in Survey Unit 1

There are no previously recorded Aboriginal sites located in Survey Unit 1.

Four previously unrecorded Aboriginal sites were identified in Survey Unit 1.

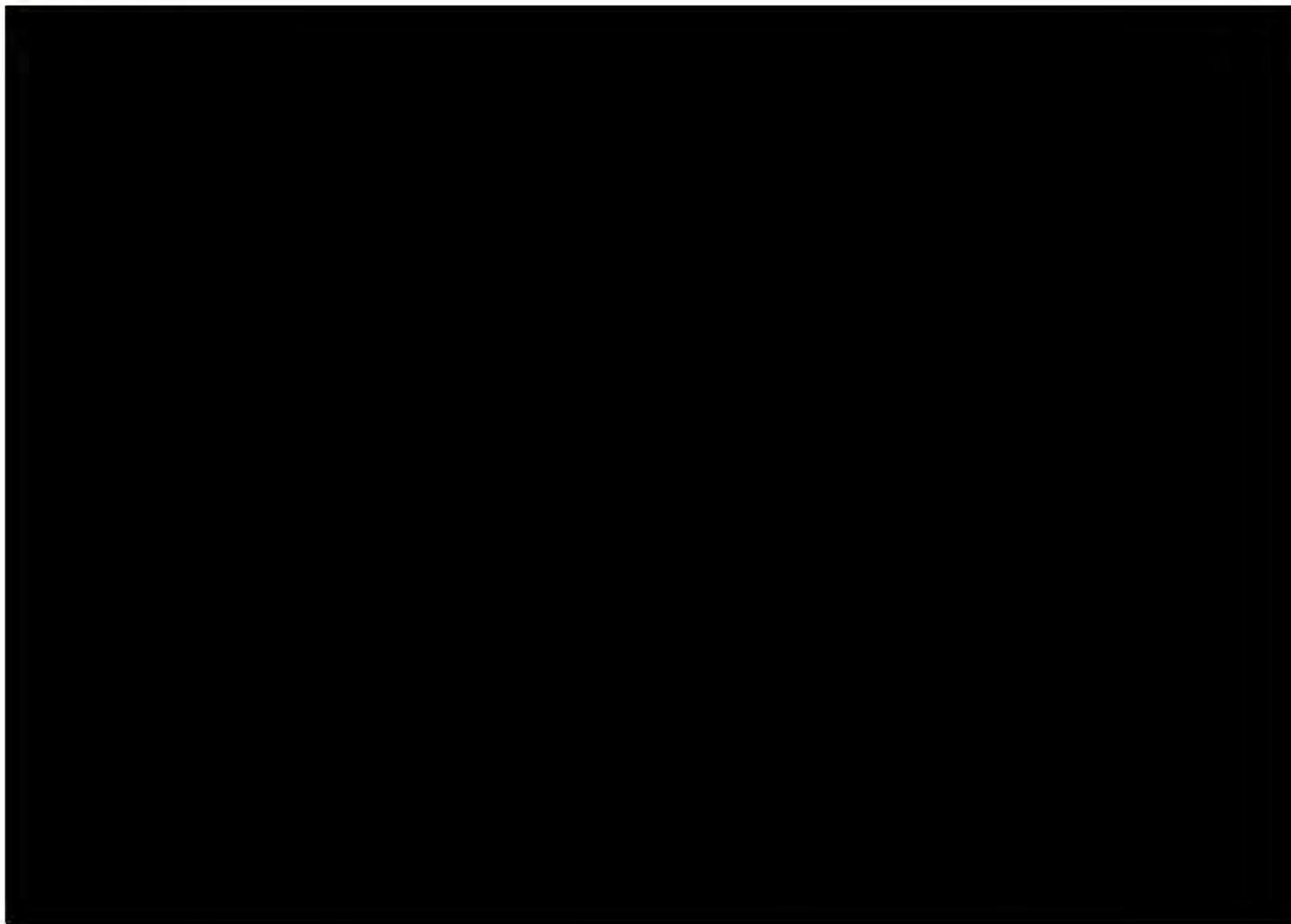
The four newly recorded sites are summarised in Table 5 and their locations shown in Figure 16. Due to the integrity of the landform and the consistency of recovering artefacts in ground exposures along the Shortland crest, these sites have been classified as an archaeological complex (Richmond Vale Rail Trail Archaeological Complex 1 [RVRT AC1]).

A full discussion of these sites is presented in Section 6.2.

**Table 5: Aboriginal sites in Survey Unit 1**

Site Name	Easting	Northing	Extent
Richmond Vale Rail Trail Artefact Scatter 1 (RVRT AS1) (AHIMS ID 38-4-1874/ 38-4-1919)	██████	██████	7m x 36m
Richmond Vale Rail Trail Isolated Find 1 (RVRT IF1) (AHIMS ID 38-4-1881/ 38-4-1920)	██████	██████	0.5m x 0.5m
Richmond Vale Rail Trail Artefact Scatter 2 (RVRT AS2) (AHIMS ID 38-4-1875/ 38-4-1918)	██████	██████	9m x 5m
Richmond Vale Rail Trail Artefact Scatter 3 (RVRT AS3) (AHIMS ID 38-4-1876/ 38-4-1917)	██████	██████	3m x 4m

Figure 16: Survey Unit 1



## 5.2 Survey Unit 2

### 5.2.1 Location and Description

Survey Unit 2 consisted of a short 150m segment through Hexham Swamp between Ironbark Creek and Fishery Creek, and north of the suburb of Shortland. The survey unit also includes the east-west connecting Pipeline Road, used as an easement for the high voltage transmission line that crosses the study area.

The survey unit is predominantly located on a raised embankment (Figure 17) that traverses Hexham Swamp (Figure 18). This embankment is in poor condition and is flooded across much of the western and northern portions of the survey unit (Figure 19).

The location of Survey Unit 2 is illustrated in Figure 21.

### 5.2.2 Environmental Context

The portion of Hexham Swamp which surrounds this survey unit is a large semi-inundated salt-water estuary. Hexham Swamp is largely drained into the Hunter River through Ironbark Creek, to the south of Survey Unit 2. The swamp has been the home to a wide variety of fish, bird and plant resources. Historical floodgates on Ironbark Creek were constructed in 1970 to control periodic flooding of the region, with the result that the swamp partially dried out. These floodgates were permanently removed from Ironbark Creek in 2013 in an attempt to restore the wetlands to their natural state.

The soils of the Hexham Swamp consist of Quaternary estuarine sediments of dark silts and clays. The largest watercourse in the area is Ironbark Creek to the south, and several transitory tributaries that cross the swamp from north to south. The swamp is heavily populated with juvenile mangroves which are developing with the restoration of salt-water to the area, and a wide variety of tussock grasses.

### 5.2.3 Ground Visibility and Disturbance

Survey Unit 2 is entirely located on a raised artificial embankment that is associated with the electricity easement through Hexham Swamp and the former alignment of the Hunter Water pipeline. This artificial embankment has been constructed through Hexham Swamp, although it has heavily degraded since the removal of the Ironbark Creek floodgates. The Ironbark Creek and Fishery Creek banks are also artificially raised on these embankments. Portions of the embankment are raised with artificial mounds to support high voltage electricity transmission towers (Figure 20).

As such, Survey Unit 2 is classified as an artificial landform, and disturbed. Surface visibility across the survey unit is very low, due to thick grasses in raised areas of the embankment, and sediment and water in those areas where the embankment has been disturbed.

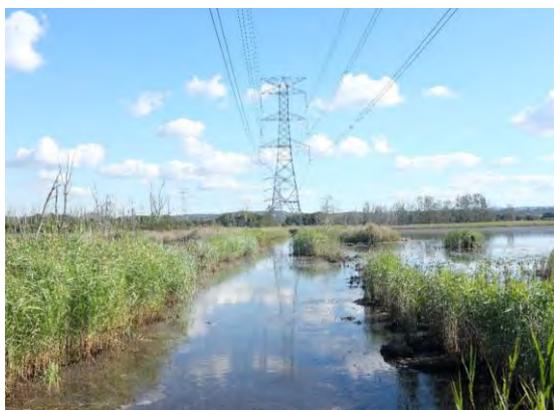
**Figure 17: Embankment along Pipeline road, west aspect**



**Figure 18: Hexham Swamp adjacent to survey unit, north aspect**



**Figure 19: Pipeline Road embankment with flooded sections, east aspect**



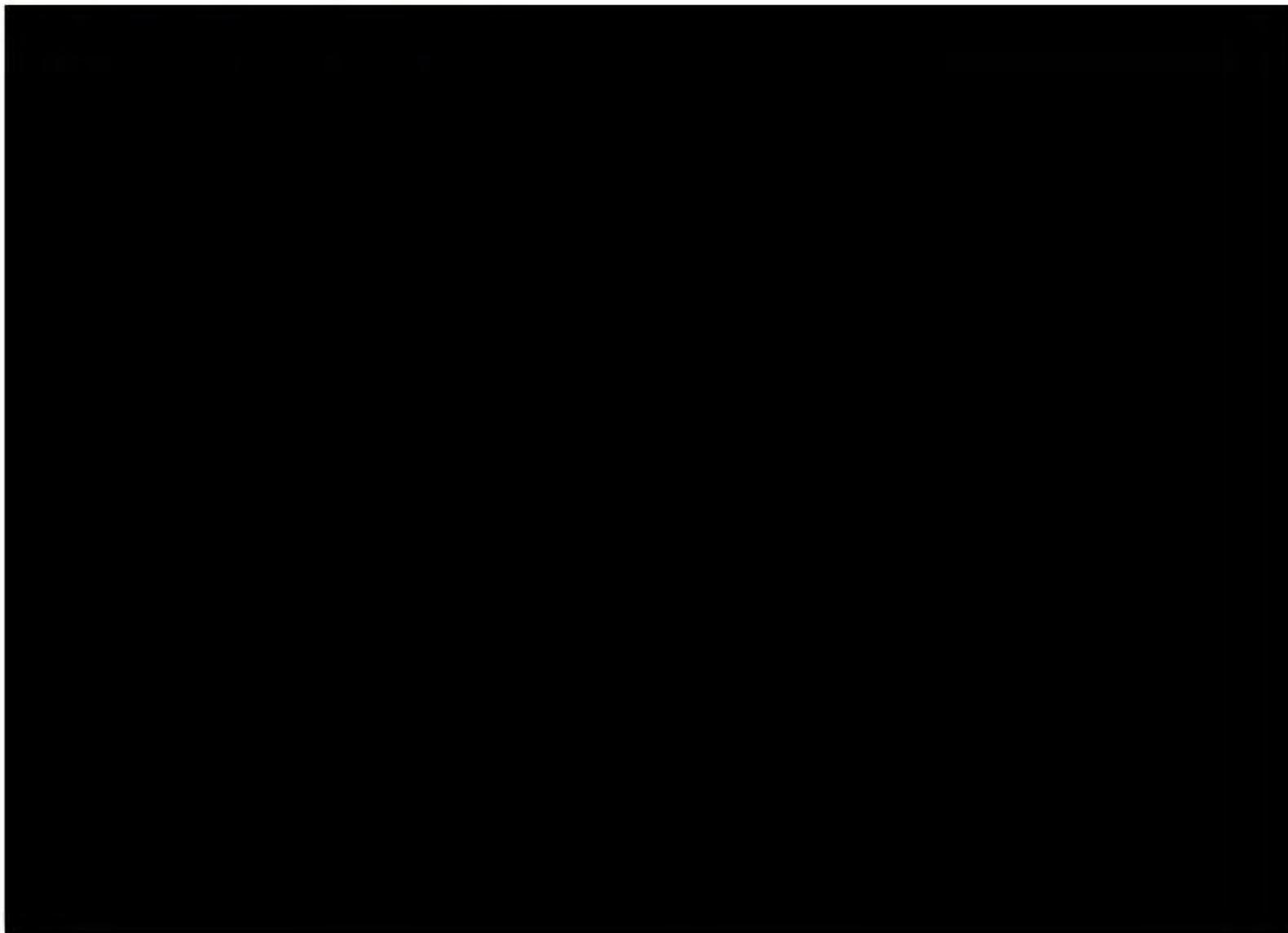
**Figure 20: Transmission line tower on raised embankment, north aspect**



#### 5.2.4 Summary of Aboriginal Sites

No Aboriginal sites were identified within Survey Unit 2.

Figure 21: Location of Survey Units 2, 3 and 4



## 5.3 Survey Unit 3

### 5.3.1 Location and Description

Survey Unit 3 is approximately 3.1km in length through Hexham Swamp along Pipeline Road, Hexham. It extends from Fishery Creek in the south (Figure 22) until the road reaches an intersection with the Aurizon mining facility roads in Hexham in the north.

The survey unit is located on raised embankment associated with Pipeline Road, which used to carry the Hunter Water pipeline (now removed). This embankment is up to two metres higher than the surrounding low-lying and periodically inundated Hexham Swamp (Figure 23). The embankment is approximately 10m to 15m wide, with several wider areas up to 30m wide.

The location of Survey Unit 3 is shown in Figure 21.

### 5.3.2 Environmental Context

The portion of Hexham Swamp which surrounds this survey unit is a large semi-inundated salt-water estuary. Hexham Swamp is largely drained into the Hunter River through Ironbark Creek, to the south of Survey Unit 3. The swamp has been the home to a wide variety of fish, bird and plant resources. Historical floodgates on Ironbark Creek were constructed in 1970 to control periodic flooding of the region, with the result that the swamp partially dried out. These floodgates were permanently removed from Ironbark Creek in 2013 in an attempt to restore the wetlands to their natural state.

The soils of the Hexham Swamp consist of Quaternary estuarine sediments of dark silts and clays. The largest watercourse in the area is Ironbark Creek to the south, and several transitory tributaries that cross the swamp from north to south. The swamp is heavily populated with juvenile mangroves which are developing with the restoration of salt-water to the area, and a wide variety of tussock grasses (Figure 24).

### 5.3.3 Ground Visibility and Disturbance

The survey unit is confined to the width of Pipeline Road, which is an unsealed road resting on an artificial embankment rising above the surrounding wetlands. This embankment has been constructed with imported fill materials, including extensive gravels in a sandy-clay matrix (Figure 25). Several concrete culverts have been constructed under Pipeline Road to control water flow in the swamp. As such, Survey Unit 2 is classified as an artificial landform, and disturbed

**Figure 22: Fishery Creek, south aspect**



**Figure 23: Pipeline Road and supporting embankment, north aspect**



**Figure 24: Hexham Swamp juvenile mangroves, tussock grasses and estuarine sediments, north-west aspect**



**Figure 25: Imported fill to construct the Pipeline Road embankment**



#### 5.3.4 Summary of Aboriginal Sites

No Aboriginal archaeological sites were identified within Survey Unit 3.

## 5.4 Survey Unit 4

### 5.4.1 Location and Description

Survey Unit 4 is an approximately 2.3km long area, extending from the intersection of the Aurizon mining site access road in the south to a concrete causeway over an east-flowing tributary of Purgatory Creek in the north (Figure 26).

The survey unit follows the course of Pipeline Road, the alignment of a Hunter Water pipeline through Hexham Swamp. Pipeline Road is located on a raised embankment that is up to two metres higher than the surround swamplands. This embankment is between 15m and 30m wide. The surrounding terrain in this area is almost completely flat.

The location of Survey Unit 4 is shown in Figure 21.

### 5.4.2 Environmental Context

The surrounding Hexham Swamp near this survey unit has been more extensively reclaimed as pasturage than the more heavily inundated swamp to the south (Figure 27). To the east of the southern portion of the survey unit, the Aurizon Hexham Train Support Facility is located on extensively disturbed and artificially built-up ground (Figure 28). A number of smaller industrial facilities are located around the northern part of the survey unit.

Soil mapping resources show that the area to the east of the survey unit has been classified as disturbed terrain, while to the west the soils are characterised as the silty clay loams of the estuarine Millers Forest landscape. Water courses in the area include unnamed upper tributaries of Ironbark, Fishery and Purgatory Creeks through Hexham Swamp.

### 5.4.3 Ground Visibility and Disturbance

The survey unit is confined to the width of Pipeline Road, which is an unsealed road resting on an artificial embankment rising above the surrounding wetlands. This embankment has been constructed with imported fill materials. A water main is located in the eastern part of the survey unit (Figure 29). The former Minmi to Hexham railway line crosses perpendicularly over the centre of the survey unit.

Survey Unit 4 consists almost entirely of disturbed ground.

**Figure 26: Concrete causeway over unnamed tributary of Purgatory Creek, south aspect**



**Figure 28: Pipeline Road with Aurizon facility disturbed ground at left of image, south**

**Figure 27: Pastoral properties to the east of the survey unit, east aspect**



**Figure 29: Water main in survey unit, east aspect**

aspect



#### 5.4.4 Summary of Aboriginal Sites

No Aboriginal archaeological sites were identified within Survey Unit 4.

## 5.5 Survey Unit 5

### 5.5.1 Location and Description

Survey Unit 5 is approximately 1.4km long and located on the northern margin of Hexham Swamp leading into the low spur crest landform context of the Tarro area. The survey unit is situated on the northern extent of Pipeline Road (Figure 30) before deviating to the west onto a new road (an unnamed road which diverges off the Maitland Road) (Figure 31). The shared pathway route then extends to the north over the Maitland Road overpass at Tarro, continuing north along this road until it turns down a laneway between 25 and 27 Anderson Drive before terminating at an unnamed road.

Several locations for proposed ancillary facilities are included in this survey unit, including areas designated for laydown and construction areas off Pipeline Road and at the eastern end of Anderson Drive (Figure 32). The survey unit boundary includes an area over Maitland Road which could be redeveloped for a bike lane overbridge.

The southern two-thirds of the survey unit is located on level ground on the northern margin of Hexham Swamp, before meeting a moderate slope at Tarro (Figure 33). The majority of the survey unit is located on existing sealed and unsealed roads and adjacent disturbed road reserves.

A map of Survey Unit 5 is provided in Figure 40.

### 5.5.2 Environmental Context

The southern portion of Survey Unit 5 is located in the Quaternary estuarine silt and clay deposits of Hexham Swamp, while the very north portion of the survey unit on the elevated spur crest at Tarro is located in the Millers Forest estuarine soil environment. The Millers Forest soil environment is characterised as poorly drained black-brown silty clay loam overlying silty clays and plastic clays.

Water sources in the study area include Purgatory Creek and the Hexham and Tarro Swamps.

### 5.5.3 Ground Visibility and Disturbance

The majority of the survey unit has been exposed to widespread ground disturbance, predominantly from the construction of an embankment through Hexham Swamp for Pipeline Road (see also Survey Units 2 and 3). The area surrounding the northern reaches of Pipeline Road is partly pastoral, with fence construction on the edge of the artificial road embankment (Figure 34). Recent construction of the Hexham Relief Road is evident (2014-2015), which involved significant earthworks during its construction. Several large stormwater services are also located throughout the area (Figure 35).

The area immediately south of the Tarro spur crest consists of the upper margin of Hexham Swamp that has been used for cattle pasturage. This area has been extensively ground-disturbed by cattle trampling in boggy ground conditions (Figure 36).

The northern portion of the study area on the spur crest in Tarro has experienced widespread ground disturbance from road construction and construction redevelopment activity (Figure 37). In addition, a number of Hunter Water services are located in the area, converging on the former Hunter Water pumping station on Anderson Drive.

However, a number of small isolated areas of ground that have only experienced at most shallow topsoil disturbance were identified in the study area. These areas were located on the higher spur crest of land immediately adjacent to the cul-de-sac at the eastern end of Anderson Drive, and on land on the south-facing hillslope south of Anderson Drive.

Ground visibility across the survey unit is very low, with areas of exposed ground principally occurring in areas where roads and access tracks have been developed or in areas where cattle-trampling of fields has turned up earth which has then dried out (Figure 38). Isolated ground exposures are visible adjacent to Anderson Drive as informal pedestrian paths. The remainder of the survey unit was grass covered or covered in extensive weed regrowth (Figure 39).

**Figure 30: Northern extent of Pipeline Road, south aspect**



**Figure 31: Unnamed Aurizon facility access road, west aspect**



**Figure 32: Eastern end of Anderson Drive, west aspect**



**Figure 33: Lower slope of Tarro spur crest north of Maitland Road, south aspect**



**Figure 34: Pipeline Road showing imported gravel on embankment and pastoral fences and gates, south-east aspect**



**Figure 35: Newly installed stormwater culvert, south-east aspect**



**Figure 36: Pastoral property with boggy cattle** **Figure 37: Area of ground disturbance from**

trampling



Figure 38: Area of dried out cattle trampling damage, south-east aspect

redevelopment in Tarro



Figure 39: Weed regrowth on margin of Anderson Drive, Tarro. North aspect.



#### 5.5.4 Summary of Aboriginal Sites

There is one AHIMS listed Aboriginal site located in survey unit 5, summarised in Table 6 (AHIMS# 38-4-1583). This site is listed as being located underneath a newly (2014 – 2015) constructed road, south of Maitland Road. This site is discussed in Section 6.1.1 and was not relocated during the site inspection.

Table 6: Previously recorded Aboriginal site in Survey Unit 5

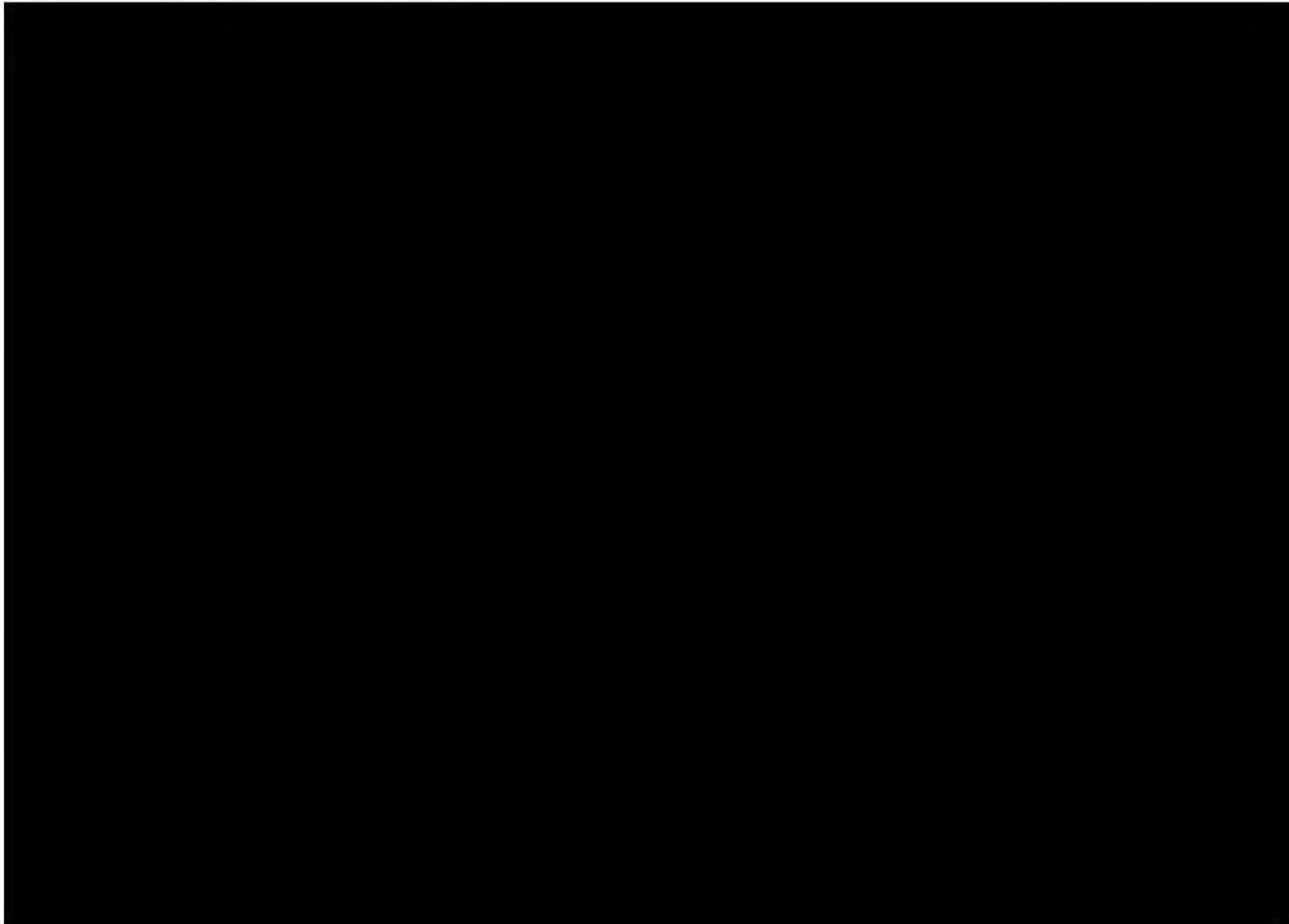
Site Name	Easting	Northing	Extent
HS2A (AHIMS ID 38-4-1583)	██████	██████	Not provided

Two previously unrecorded Aboriginal sites were identified during the site inspection, RVRT IF 2 and RVRT IF 3. These two sites are discussed in Sections 6.4.1 and 0, and summarised in Table 7.

Table 7: Aboriginal sites in Survey Unit 5

Site Name	Easting	Northing	Extent
Richmond Vale Rail Trail Isolated Find 2 (RVRT IF 2) (AHIMS ID 38-4-1882/ 38-4-1910)	██████	██████	0.5m x 0.5m
Richmond Vale Rail Trail Isolated Find 3 (RVRT IF 3) (AHIMS ID 38-4-1883/ 38-4-1922)	██████	██████	0.5m x 0.5m

Figure 40: Map of Survey Unit 5 with Aboriginal sites



## 5.6 Survey Unit 6

### 5.6.1 Location and Description

Survey Unit 6 is an approximately 5.7km long linear area running through Hexham Swamp and oriented approximately north-east to south-west. The survey unit is situated on an embankment constructed for the former Minmi to Hexham Railway Line (later the Richmond Vale Railway) (Figure 41). The embankment is up to 2m higher than the surrounding Hexham Swamp terrain and up to 15m in width. At the south-western end of the survey unit the area expands to include Minmi Junction, a large artificial embankment which used to be a three-way railway junction.

The location of Survey Unit 6 is illustrated in Figure 45.

### 5.6.2 Environmental Context

The survey unit is surrounded by Hexham Swamp, a largely salt-water estuarine environment. There are two soil landscapes in this surrounding area, the Hexham Swamp estuarine deposits, and the Bobs Farm estuarine soil landscape. The latter consists of former lake shore sandy beach deposits overlying partially desaturated Hexham Swamp silty clay deposits.

To the north of the railway embankment, much of Hexham Swamp was partially inundated at the time of the site inspection (Figure 42). Gently sloped spur crests are located near the southern end of the survey unit, extending into Hexham Swamp. Water courses in the area have a higher freshwater proportion than the brackish and salty streams located further east in Hexham Swamp, with the upper tributaries of Back Creek and Fishery Creek being located within 200m of the survey unit on either side.

### 5.6.3 Ground Visibility and Disturbance

Ground visibility in the survey unit is low, due to extensive vegetation growth over much of the former railway line. Areas of surface visibility were observed along the edge of the embankment where ground exposures have formed from erosion of the embankment. These exposures confirm that the embankment is constructed entirely of artificially imported material, predominantly shale, sand and fly ash (Figure 43). At Mimi Junction in the south of the survey unit, vehicle tyre ruts reveal mixed sand and fly ash to up to 0.4m depth (Figure 44).

Almost the entirety of the survey unit is considered to be introduced material, and as such is classified as disturbed ground.

**Figure 41: Former Minmi to Hexham railway line embankment, south-western aspect**



**Figure 42: Partially inundated area of Hexham Swamp, north aspect**



**Figure 43: Exposure on former Minmi to Hexham railway line, south-east aspect**



**Figure 44: Tyre rut at Minmi Junction, showing extensive artificial deposit, south aspect**

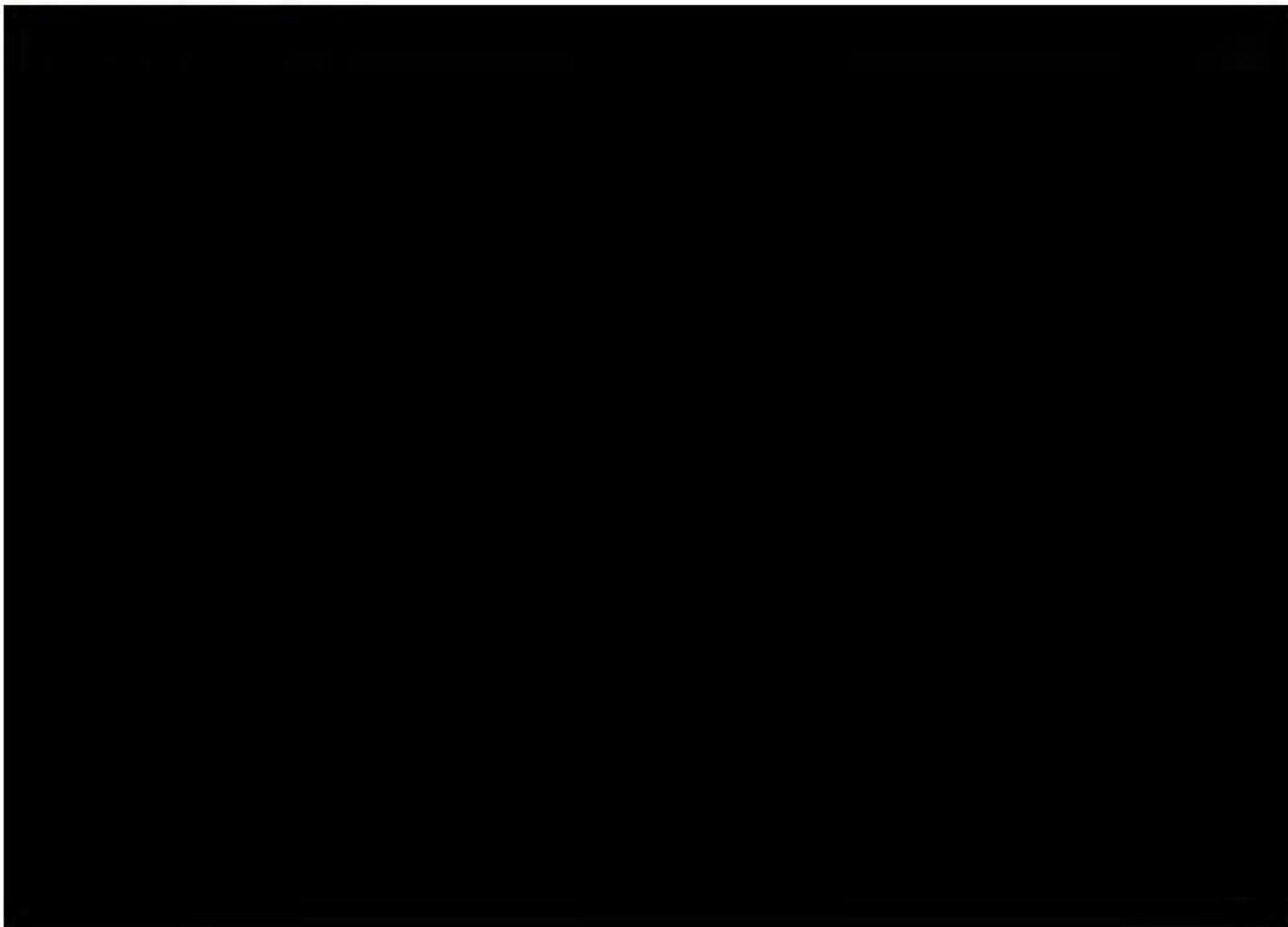


#### 5.6.4 Summary of Aboriginal Sites

AHIMS site Lenaghans AS 2 (AHIMS ID 38-4-1378) is located [REDACTED] outside the study area. As such, the site was not visited during the survey.

No Aboriginal sites were identified within Survey Unit 6.

Figure 45: Map of Survey Units 6, 7 and 8



## 5.7 Survey Unit 7

### 5.7.1 Location and Description

Survey Unit 7 is an approximately 850m long linear transect through Hexham Swamp with a small portion at its south-eastern extent rising onto a gently sloped spur crest in the suburb of Fletcher (Figure 46). The majority of this survey unit follows the alignment of a Hunter Water pipeline, which runs through tall estuarine reeds in the upper reaches of Hexham Swamp (Figure 47). The survey unit curves around the outer edges of the Fletcher spur crest before rising to level with the crest itself (Figure 48). The location of Survey Unit 7 is illustrated in Figure 45.

### 5.7.2 Environmental Context

The survey unit is located in two soil landscape areas. Across Hexham Swamp, the area is located in the Bobs Farm soil landscape, consisting of aeolian deposited sand overlying partially dried estuarine silty clay deposits. This area was heavily vegetated with reeds and grasses (Figure 49). The south-eastern portion of the survey unit is located on the Beresfield residual soil landscape, consisting of dark brown upper topsoils overlying lighter brown sandy loam.

Water courses near this survey unit include the predominately freshwater upper tributaries of Fishery Creek and Back Creek.

### 5.7.3 Ground Visibility and Disturbance

Ground visibility through the Hexham Swamp portion of the survey unit was nil, due to the thick reeds and grasses. Pedestrian access was only possible by traversing the Hunter Water pipeline through the area. The pipeline itself was resting on concrete footings which would likely have caused minor subsurface disturbance during their installation.

The Fletcher hillslope did not show significant signs of ground disturbance. There was moderate surface visibility across the crest landform in Fletcher due to erosion and pedestrian paths at the edge of the crest (Figure 50). Disturbance across the crest context included construction of a new footpath as well as a new stormwater drainage line (Figure 51), with new garden beds installed in this area as well. These disturbances were generally limited to a curving margin directly adjacent to Kural Crescent, with the area between the new footpath and the edge of the hillslope largely intact.

**Figure 46: Newly built Sanctuary Estate in the suburb of Fletcher, north-eastern aspect**



**Figure 47: Hunter Water pipeline through survey unit, south-east aspect**



**Figure 48: View from edge of Fletcher hillcrest over hillslope and Hexham Swamp, north-west**

**Figure 49: Thick vegetation in Hexham Swamp**

aspect



Figure 50: Exposures along edge of Fletcher hillcrest, south-west aspect

in the survey unit, south-western aspect



Figure 51: Newly constructed footpath with stormwater drain to left, south-western aspect



#### 5.7.4 Summary of Aboriginal Sites

One Aboriginal site was identified in Survey Unit 7, called Richmond Vale Rail Trail Artefact Scatter 9 (RVRT AS 7). This artefact site and associated archaeological potential is [REDACTED]. The site encompasses the majority of the outer hillcrest and upper slope at Fletcher component of Survey Unit 7. A complete description of the site is provided in Section 6 and site details are summarised in Table 8.

Table 8: Aboriginal sites in Survey Unit 7

Site Name	Easting	Northing	Extent
Richmond Vale Rail Trail Artefact Scatter 7 (RVRT AS 7) (AHIMS ID 38-4-1880/ 38-4-1923)	[REDACTED]	[REDACTED]	160m x 10m

## 5.8 Survey Unit 8

### 5.8.1 Location and Description

Survey Unit 8 is an approximately 1.9km long linear transect through the upper reaches of Hexham Swamp (Figure 52) between Minmi Junction and the township of Minmi, terminating at an unsealed access road from McInnes Street and Woodford Street. Survey Unit 8 follows the line of the former Minmi to Hexham Railway Line, and is located on a raised embankment through Hexham Swamp that meets with the gentle slopes of the township of Minmi. In approximately the centre of the survey unit, a concrete culvert and bridge has been erected over the course of Minmi Creek (Figure 53).

### 5.8.2 Environmental Context

The survey unit traverses the upper portion of Hexham Swamp through the Bobs Farm landscape variant, consisting of former lake shore sandy beach deposits overlying estuarine silty clays. In the south of the survey unit as the study area rises into the low hills at Minmi, the soil landscape shifts to the Killingworth colluvial soils on top of the underlying Newcastle Coal Measure geology. This landscape is characterised by rolling low hills with relatively shallow topsoils.

Water courses near this survey unit include the freshwater streams of Back and Minmi Creeks that feed into Hexham Swamp (Figure 54).

### 5.8.3 Ground Visibility and Disturbance

Surface visibility in the northern part of the survey unit is poor, with limited exposures along the former railway line where vehicle tracks have worn away the local grass cover. Exposures in this area reveal black fly ash and ballast-laden soils, confirming the artificial nature of the embankment. This embankment is further cut across with utility services.

The embankment continues in the southern part of the survey unit, where grass cover is thicker and surface visibility is nil (Figure 55).

**Figure 52: Reeds in upper part of Hexham Swamp, west aspect**



**Figure 53: Concrete culvert and bridge over Minmi Creek, north-east aspect**



**Figure 54: Minmi Creek, north-west aspect**



**Figure 55: Grass cover on Minmi to Hexham railway line in southern portion of survey unit, south-west aspect**



#### 5.8.4 Summary of Aboriginal Sites

No Aboriginal sites were identified in Survey Unit 8.

## 5.9 Survey Unit 9

### 5.9.1 Location and Description

Survey Unit 9 extends west from Minmi Junction out of Hexham Swamp through low gradient rolling hills (Figure 56). The survey unit then passes through tunnels beneath Lenaghans Drive (Figure 57) and the M1 Pacific Motorway before traversing the Pambalong Nature Reserve (Figure 58). Survey Unit 9 then takes a slight south-western turn through predominantly pastoral properties before terminating at Dog Hole Road in Stockrington. The survey unit is approximately 2.9km long.

The eastern portion of Survey Unit 9 alternates between raised embankments and railway cuttings (Figure 59), before entering excavated rail cuttings as it travels through low hills before reaching the Lenaghans Drive tunnel. The area through the Pambalong Nature Reserve consists of a raised embankment. West of the Pambalong Nature Reserve, the route alternates between built up former rail embankments and cuttings through the low hills of the surrounding area. Cuttings through former low relief hills in this area are up to 5m in height.

The location of Survey Unit 9 is illustrated in Figure 62.

### 5.9.2 Environmental Context

The eastern portion of the survey unit is located within the Bobs Farm soil landscape, characterised by thin sandy deposits overlying deeper estuarine silts and clays, in the upper reaches of Hexham Swamp. From here, the local soil landscape shifts to a Beresfield soil landscape in the low hills of Lenaghan and Minmi which the route passes through. While the route is located on a level embankment which has been either cut through or built up over the low rolling hills, this embankment closely fringes spur crests and nearby upper tributaries of Hexham Swamp.

After passing through the Lenaghans Drive and M1 Pacific Motorway tunnels, the survey unit traverses the rail embankment through Pambalong Nature Reserve. The nature reserve consists of a remnant portion of the upper freshwater portion of Hexham Swamp, now partially cut off from the remainder of the swamp following construction of the M1 Motorway.

The western portion of Survey Unit 9 traverses the Beresfield soil landscape where low rolling hills rise out of the upper reaches of Hexham Swamp. The Beresfield soil landscapes consists of brown sandy loams which are highly erodible.

Water courses in this location consist predominantly of the freshwater Pambalong Swamp, the upper reaches of Hexham Swamp, and a number of unnamed freshwater feeder streams.

### 5.9.3 Ground Visibility and Disturbance

Ground visibility across the survey unit was relatively low during the survey, with exposures and visibility only present along areas of the route which have been disturbed by vehicle traffic. These exposures reveal deposited black railway ballast. In the west parts of the survey area, washed in sediment has accumulated from nearby unsupported railway cuttings (Figure 60).

Vegetation cover throughout the route is very high, with a portion between Minmi Junction and the Lenaghans Drive tunnel difficult to traverse because of extensive vegetation regrowth.

Railway beams and sleepers are present through parts of the survey unit (Figure 61). The railway line is constructed of built up imported fly ash, slate and sand. This railway ballast is present in areas where the rail line is cut through the low relief hills in the region as well.

The survey unit is almost entirely ground disturbed from construction of the original railway line.

**Figure 56: Low hills near the survey unit, north aspect**



**Figure 57: Lenaghans Drive tunnel portal, west aspect**



**Figure 58: Pambalong Nature Reserve swamps and vegetation, north-west aspect**



**Figure 59: Railway line cut through nearby hills, north-west aspect**



**Figure 60: Washed in sediment over the rail route, west aspect**



**Figure 61: Rail lines and sleepers in the survey unit, west aspect**



#### 5.9.4 Summary of Aboriginal Sites

No Aboriginal sites were identified within Survey Unit 9.

During the site survey, two areas immediately adjacent to the alignment of the former railway line were identified as areas of possible archaeological sensitivity. Although the purpose of this investigation was not to identify areas of archaeological potential outside the study area, these sections were observed and recorded. These sensitive areas were located in contexts of spur crests

which adjoined the upper margins of Hexham Swamp, and due to the topography, the embankments and cuttings of the former Richmond Vale Railway Line directly contacted these areas of sensitivity at their edges. These spur crests were identified as sensitive areas due to the location of this landform near the swamp edge, and the correlation of these landforms with other nearby spur crests which registered Aboriginal sites listed on the OEH AHIMS site register are associated with.

Due to the survey being geographically constrained to the study area only, the exact degree of archaeological sensitivity, and the extent of any areas of PAD, could not be accurately assessed. A map of these areas of sensitivity is provided in Figure 62. Further investigation would be required to determine the nature and extent of these areas of sensitivity in locations which exceed the boundaries of the study area of the current assessment.

It should be noted that this area of archaeological sensitivity was only opportunistically examined due to low vegetation coverage and relatively easy access to the surrounding landform in this area. It is likely that other areas of archaeological sensitivity exist directly adjacent to the study area in similar landform contexts. If the study area is ever expanded in this area, further detailed survey of these areas would be required for assessment and to describe what future archaeological investigation will be required, such as test excavation.

Proposed project boundary changes overlap some of these areas. Further investigation is required of this area before this report can be finalised.

Figure 62: Location of Survey Unit 9

