

Elizabeth Drive – West Upgrade

Non-Aboriginal Heritage Impact Assessment

08-Sep-2023
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Non-Aboriginal Heritage Impact Assessment

Client: Transport for New South Wales

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Quality Information

Document 60641411

Date 08-Sep-2023

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Reviewed by Chris Lewczak and Dr Darran Jordan

Revision History

Rev	Revision Date	Details	Authorised	
			Name/Position	Signature
0	19 July 2022	Draft for TfNSW Review	Dr Darran Jordan	DJordan
1	09 August 2022	Draft for TfNSW Review	Dr Darran Jordan	DJordan
2	11 August 2022	Final	Tessa Drayson	TDrayson
3	3 July 2023	Final draft for Gateway review	Tessa Drayson	TDrayson
4	08-Sep-2023	Final for client submission	Tessa Drayson	TDrayson

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Glossary and abbreviations

Term	Description
Area of investigation	Area investigated for each environmental factor relative to the proposal and construction footprint in terms of potential impacts (varies depending on environmental factor). The investigation area may be a defined area such as an entire local government area or it may be an area around the proposal, for example, a 100-metre area either side of the existing road
Construction ancillary facilities	Dedicated areas of land required for construction amenities, parking, materials/equipment storage, mobile asphalt batch plants and stockpiling
Construction footprint	The area needed to construct the proposal, including for example construction ancillary facilities, access roads, haulage and water quality basins
Operational footprint	The area needed for the operation of the proposal including the concept design
Transport for NSW (Transport)	Transport for New South Wales, also referred to as Transport
Proposal	The Elizabeth Drive West Upgrade – the upgrade of about 3.6 km of Elizabeth Drive from The Northern Road at Luddenham to near Badgerys Creek Road at Badgerys Creek where it would connect with the future M12 Motorway
Study area	The study area includes: The construction footprint and a 200-metre assessment buffer around the construction footprint; and the full extent of adjoining properties where they extend outside the 200-metre buffer

Acronym	Definition
CCTV	Closed-Circuit Television
CHL	Commonwealth Heritage List
DPE	NSW Department of Planning and Environment
EIS	Environmental Impact Statement
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i> (NSW) Provides the legislative framework for land use planning and development assessment in NSW
EP&A Regulation	<i>Environmental Planning and Assessment Regulation 2021</i> (NSW)
EPBC Act	<i>Environment Protection and Biodiversity Act 1999</i> (Commonwealth) Provides for the protection of the environment, especially matters of national environmental significance, and provides a national assessment and approvals process.
ITS	Intelligent Transport System
Heritage Act	<i>Heritage Act 1977</i> (NSW)
km	kilometres
LEP	Local Environmental Plan A type of planning instrument made under Part 3 of the EP&A Act.
LGA	Local Government Area
m	metres
NHL	National Heritage List
REF	Review of environmental factors

Acronym	Definition
RNE	Register of the National Estate
Roads and Maritime	NSW Roads and Maritime Services, now known as Transport for NSW
SEPP	State Environmental Planning Policy A type of planning instrument made under Part 3 of the EP&A Act.
SHI	State Heritage Inventory
SHR	State Heritage Register
SOHI	Statement of Heritage Impact
TAHE	Transport Asset Holding Entity
VMS	Variable Message Signs
WHL	World Heritage List
WPCSEPP	State Environmental Planning Policy (Precincts-Western Parkland City) 2021
WSA	Western Sydney Airport

Executive Summary

Transport for NSW (Transport) proposes to upgrade about 3.6 kilometres of Elizabeth Drive from The Northern Road at Luddenham to near Badgerys Creek Road at Badgerys Creek, where it would connect with the future M12 Motorway (the proposal).

This Non-Aboriginal Heritage Impact Assessment (HIA) has been prepared as part of the Review of Environmental Factors (REF) prepared for the proposal. This report assesses the heritage values attached to the construction footprint and the impact of the proposal on those heritage values. For the purposes of this assessment the construction footprint comprises the extent of the construction and operational footprint, and the study area a 200-metre buffer around the construction footprint, while also including those adjoining properties that extend outside the 200-metre buffer.

A search of heritage databases and a literature review identified four items of non-Aboriginal heritage within the study area: Luddenham Road Alignment, McGarvie Smith Farm, McMaster Field Station and Badgerys Creek post office. Luddenham Road Alignment lies within the construction footprint and is listed as a local item in Schedule 5 of Penrith LEP 2010. The construction footprint encroaches into part of the McGarvie Smith Farm property which is listed as an item of local heritage significance in Schedule 2 of the State Environmental Planning Policy (Precincts-Western Parkland City) 2021 (WPCSEPP). It has recently been delisted from Schedule 5 of Penrith LEP 2010.

Findings from a site inspection carried out on 17 June 2022, and significance and impact assessments for the Luddenham Road Alignment and McGarvie Smith Farm, indicate that these items are expected to be directly impacted by the proposal during the construction phase. However, the principal heritage values attached to the Luddenham Road Alignment relate to the historic context and the aesthetic appeal of the alignment with long stretches of post and rail fencing. The proposal would widen the existing Luddenham Road alignment to about 60 metres, for a length of about 100 metres north of the intersection with Elizabeth Drive, before tapering into the existing alignment. The proposal would not alter the alignment, and the item would continue to fulfil its historical purpose as an essential link between St Marys and Luddenham.

The principal heritage values attached to McGarvie Smith Farm relate to its historic use as a veterinary research facility and the historical and aesthetic significance of the 1936 buildings; McGarvie Smith no. 1, 2 and 3. The proposal would not impact the significant buildings located within the curtilage of the item, which are located outside the construction footprint and separated by an access track.

The literature review found that although McMaster Field Station was partially located within the construction footprint, the significant buildings within the property are located about 350 metres north of the construction footprint, and this item is therefore unlikely to be impacted by the proposal. The Badgerys Creek post office has been removed by construction activities associated with the WSA, and any traces of the post office have therefore likely been removed. The proposal would therefore not impact this item. A review of relevant projects in the area and their impact on heritage was also carried out to assess cumulative impacts on non-Aboriginal heritage. The review concluded that the cumulative impact on non-Aboriginal heritage by this proposal is considered negligible.

It is also noted that although unlikely, the wider area has a long non-Aboriginal settlement history and, as a consequence, archaeological deposits are possible within the construction footprint. The following recommendations were made to avoid or protect heritage values and to minimise or mitigate heritage impacts:

- If any archaeological deposits are uncovered during construction, they should be managed through Transport's *EMF-HE-PR-076 Unexpected Heritage Items Procedure 2022* (Transport for NSW, 2022), in accordance with the safeguards and management measures in Section 10.0
- All contractors should be advised by way of induction and toolbox talks of the presence of nearby heritage, the potential for archaeological deposits to be present and the provisions and responsibilities required in the *EMF-HE-PR-0076 Unexpected Heritage Items Procedure 2022* (Transport for NSW, 2022), in accordance with safeguard GEN4 in Section 7.2 of the REF.

1.0 Introduction

Elizabeth Drive is the main east-west corridor between Liverpool and surrounding suburbs. Between The Northern Road at Luddenham and Badgerys Creek Road at Badgerys Creek, Elizabeth Drive is predominantly a two lane undivided road, with no footpath and no median.

Future projected and planned growth in this region of Western Sydney is expected with the planned development of the Western Sydney Aerotropolis. It is projected that an expansion of industrial and commercial precincts would be prompted in response to the development of the Western Sydney Aerotropolis, as well as related planned land releases for residential precincts and employment zones.

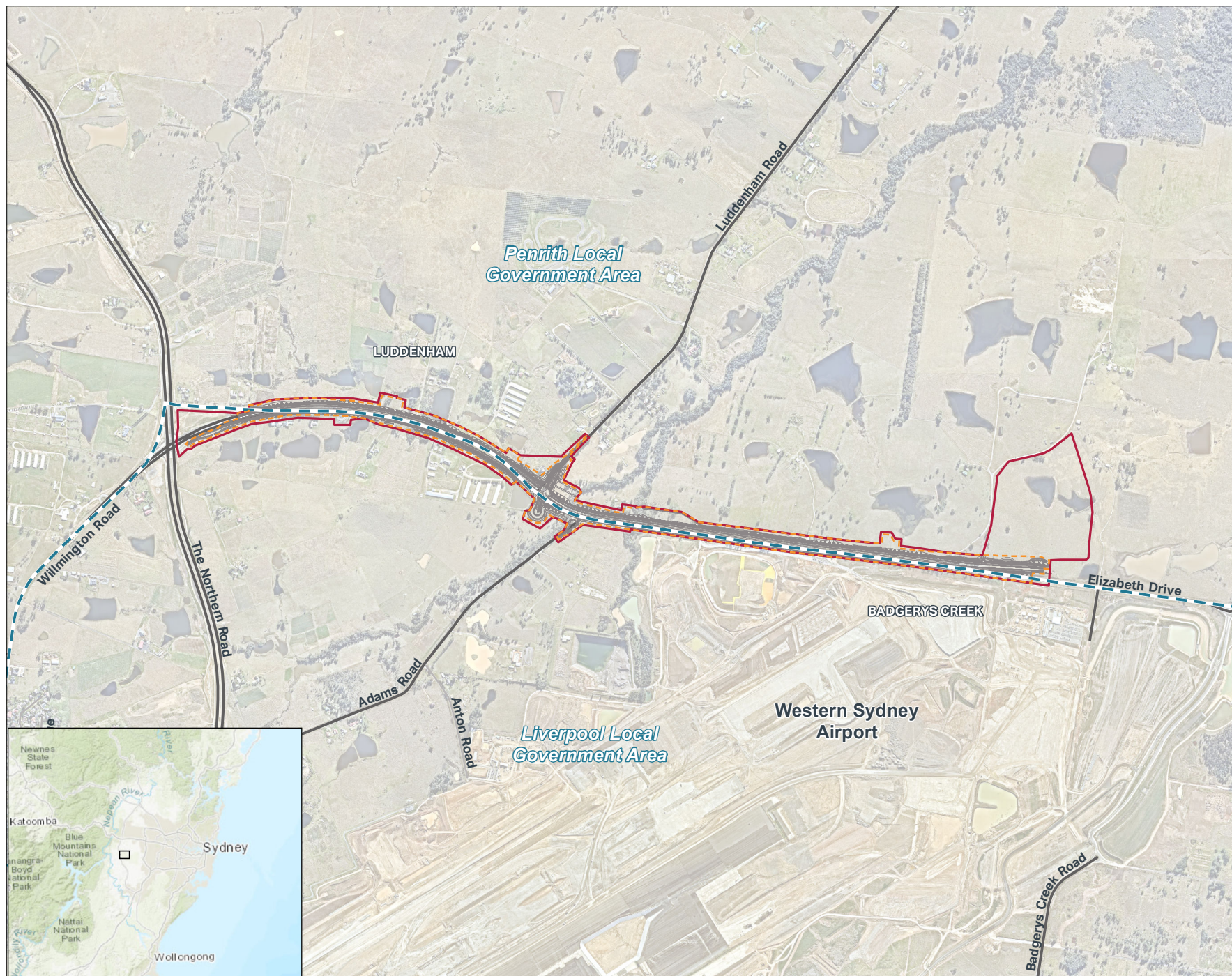
This projected growth would require the upgrade of Elizabeth Drive to provide increased capacity between the existing and planned road corridors in the surrounding area, and to support the projected and planned development of the Western Sydney Aerotropolis.

1.1 Proposal overview

Transport for NSW (Transport) proposes to upgrade about 3.6 kilometres of Elizabeth Drive between The Northern Road at Luddenham to near Badgerys Creek Road at Badgerys Creek, where it would connect with the future M12 Motorway. The proposal would be carried out within the Penrith Local Government Area (LGA) and the Liverpool LGA.

The location and extent of the proposal is provided Figure 1-1 (the construction footprint).

**FIGURE 1-1:
LOCATION OF THE PROPOSAL**



- Legend**
- Construction footprint
 - Operational footprint
 - LGA boundary
 - Road design
 - Primary road
 - Local road

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1.2 Purpose of this technical report

This technical report provides an assessment of the potential heritage impacts associated with the proposal and has been prepared to inform the review of environmental factors (REF). It contributes to fulfilling the requirements of Section 5.5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) which requires that Transport examines and takes into account to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the activity.

2.0 Project description

Key features of the proposal (subject to detailed design) would include:

- Upgrade of Elizabeth Drive from a two-lane rural road, to a four-lane road (two lanes in each direction) with provision of a central median to allow for future upgrade to six lanes
- A new culvert at Cosgroves Creek to carry eastbound and westbound traffic
- Upgrades to two intersections along Elizabeth Drive: Luddenham Road and Adams Road
- Active transport provision along the full corridor with the inclusion of shared paths along both sides of Elizabeth Drive corridor
- Inclusion of public transport infrastructure with bus priority at intersection and bus stops facilities
- New stormwater drainage infrastructure
- Property acquisitions and adjustments on both sides of Elizabeth Drive and some side roads.
- Relocation/adjustment of existing utilities.

Subject to detailed design and construction planning, construction of the proposal is anticipated to take about 48 months to complete.

The following three temporary construction ancillary facilities would be established to support construction of the proposal:

- The Northern Road (construction ancillary facility 1) – located at the north-eastern corner of the Elizabeth Drive and The Northern Road intersection
- Luddenham Road (construction ancillary facility 2) – located at the north-western corner of the Elizabeth Drive and Luddenham Road intersection
- M12 Motorway tie in (construction ancillary facility 3) – located west of Badgerys Creek Road on the northern side of Elizabeth Drive. Subject to detailed design and construction planning, it is anticipated that this construction ancillary facility would operate as the main site office during construction of the proposal.

Construction ancillary facilities 1 and 2 would be located on private land acquired or leased by Transport. Construction ancillary facility 3 would be located on land which is currently being used to support construction of the M12 Motorway.

- Each construction ancillary facility may include the following:
 - Establishment of site office/s, amenities, and temporary infrastructure, such as fencing and car parking areas
 - Laydown and storage areas, and delivery of plant, equipment and materials
 - Secure and bunded storage areas for re-fuelling and chemical storage
 - Concrete batching plant
 - Material crushing
 - Stockpiling areas and spoil management (topsoil, excavated natural material, contaminated material). Stockpile locations would be determined during subsequent design stages using the criteria set out in the *Stockpile Management Guideline* (RMS, 2015).

Construction of the proposal would involve the following general activities:

- Site establishment including set up of construction ancillary facilities and installation of environmental protection controls, including around creek areas
- Utility adjustments, relocations and replacements, where required
- Demolition of existing buildings/structures
- Property adjustments (eg adjustments to fencing, property accesses)
- Vegetation removal
- Earthworks and drainage work
- Adjustments to existing farm dams within the construction footprint, including pumping out and re-shaping where required
- Cosgroves Creek culvert work, including installation of temporary diversion (if required) and temporary creek crossing, construction of new culvert structures and demolition/removal of the existing culvert
- Elizabeth Drive Upgrade main roadwork, including intersections with local roads and walking and cycling infrastructure
- Landscaping and finishing work.

3.0 Methodology

This section describes the method of assessment used in this technical assessment report and outlines the study area for the proposal.

3.1 Method of assessment

This non-Aboriginal heritage assessment has been carried out in accordance with *Assessing Heritage Significance* (NSW Heritage Office & Department of Urban Affairs & Planning, 2001) and *Statements of Heritage Impact* (NSW Heritage Office & Department of Urban Affairs & Planning, 2002). The assessment methodology has included:

- Review of proposal general arrangement drawings and design reports
- Review of the following key documents:
 - Heritage register listings
 - Historic plans
 - Previous reports and other relevant documentation
- Background research into the historical development of the construction footprint and surrounding areas using the historic plans, historical photographs, newspapers and other primary and secondary historical sources as relevant and referenced in Section 5.3
- Site inspection on 17 June 2022 by AECOM staff assessing the existing road and adjoining properties along with the existing character of the construction footprint and surrounding land uses
- Significance assessment of heritage items in accordance with *Assessing Heritage Significance*
- Impact assessment of direct or indirect construction and/or operational impacts to identified heritage significance
- Review of relevant projects in the area and their impact on heritage to determine conclusions regarding cumulative impacts on non-Aboriginal heritage
- Summary of Statement of heritage impact, as assessed against the criteria outlined in the NSW Heritage Division guidelines
- Recommendation of safeguards and management measures to safeguard non-Aboriginal heritage from potential impacts of the proposal.

3.2 Study area

To capture the relevant non-Aboriginal heritage values and themes of potential impact by the proposal, the study area includes:

- The construction footprint (refer to Figure 1-1)
- A 200-metre assessment buffer around the construction footprint
- Adjoining properties (including full extent of property where it extends outside the 200-metre buffer).

The study area is shown in Figure 3-1.

3.3 Report limitations

The purpose of this report is to identify and assess historic heritage and archaeological potential that might be impacted by the proposal. Predictions have been made within this report about the probability of subsurface archaeological materials occurring within the site, based on surface indications and environmental contexts. However, it is possible that materials may occur in areas without surface indications and in any environmental context. Should subsurface archaeological materials be uncovered

during construction, these would be addressed in accordance with the *EMF-HE-PR-076 Unexpected Heritage Items Procedure 2022* (Transport for NSW, 2022).

This report is based on the concept design and is subject to detailed design. It is noted that during detailed design, details of the proposal may change or be refined. Further heritage assessment may be required to assess the potential additional impacts to heritage during detailed design as outlined in Section 9.0.

A summary of the statutory requirements regarding historical heritage is provided in Section 4.0. The summary is provided based on the experience of the authors with the heritage system in Australia and does not purport to be legal advice. It should be noted that legislation, regulations and guidelines change over time and users of the report should satisfy themselves that the statutory requirements have not changed since the report was written.



Figure 3-1: Study area

4.0 Statutory context

A number of planning and legislative documents govern how heritage is managed in NSW and Australia. The following section provides an overview of the requirements under each as they apply to the Proposal.

4.1 Commonwealth legislation

4.1.1 Environment Protection and Biodiversity Conservation Act 1999

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) defines 'environment' as both natural and cultural environments and, therefore, includes Aboriginal and non-Aboriginal historic cultural heritage items. Under the EPBC Act, protected heritage items are listed on the National Heritage List (NHL) (items of significance to the nation) or the Commonwealth Heritage List (CHL) (items belonging to the Commonwealth or its agencies). These two lists replaced the Register of the National Estate (RNE). The RNE has been suspended and is no longer a statutory list; however, it remains as an archive.

Under Part 9 of the EPBC Act, any action that is likely to have a significant impact on a matter of National Environmental Significance (known as a controlled action under the EPBC Act), may only progress with approval from the Commonwealth Minister for the Environment. An action is defined as a project, development, undertaking, activity (or series of activities), or alteration. An action would also require approval if:

- It is undertaken on Commonwealth land and would have or is likely to have a significant impact on the environment of Commonwealth land
- It is undertaken by the Commonwealth and would have or is likely to have a significant impact.

4.2 State legislation

4.2.1 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act) allows for the preparation of planning instruments to direct development within NSW. This includes Local Environmental Plans (LEP), which are administered by local government and contain provisions to guide land use and the process for development applications. LEPs usually include clauses requiring that heritage be considered during development applications and a schedule of identified heritage items be provided. The EP&A Act also allows for the gazettal of State Environmental Planning Policies (SEPP).

4.2.2 State Environmental Planning Policy (Transport and Infrastructure) 2021 (Transport and Infrastructure SEPP)

State Environmental Planning Policy (Transport and Infrastructure) 2021 (Transport and Infrastructure SEPP) aims to facilitate the effective delivery of infrastructure across the State.

Clause 2.108 of the Transport and Infrastructure SEPP permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent. As the proposal is for road and road infrastructure facilities and is to be carried out by Transport as a public authority, it is permissible without development consent and can be assessed under Division 5.1 of the EP&A Act.

Clause 2.11 of Transport and Infrastructure SEPP applies to infrastructure developments carried out by, or on behalf of, a public authority, if the development is likely to impact a local heritage item or heritage conservation area (other than a heritage item that is also a State heritage item). A public authority, or person/s acting on behalf of a public authority, must not carry out a development to which clause 2.11 applies, unless an assessment of the proposed impact has been prepared and forwarded to the local government of the area for comment. Comments received within 21 days must be taken into consideration. Consultation has been carried out with Penrith City Council and Liverpool City Council in accordance with the Transport and Infrastructure SEPP and is documented in Chapter 5 (Consultation) of the REF.

4.2.3 State Environmental Planning Policy (Precincts – Western Parkland City) 2021

The proposal is entirely situated within land subject to the State Environmental Planning Policy (Precincts-Western Parkland City) 2021 (WPCSEPP). The WPCSEPP includes planning controls that would enable the land within the Western Sydney Aerotropolis to be developed for aviation services and aims to facilitate development in the Western Sydney Aerotropolis in accordance with the Western Sydney Aerotropolis Plan. The WPCSEPP requires each precinct of the Western Sydney Airport (WSA) to have a precinct plan that sets out the strategic vision for, the proposed land uses in, and the performance criteria for development in the precinct.

Clause 4.26 of the WPCSEPP requires consent for any development with the potential to impact heritage items and/or archaeological sites. Before granting consent, a heritage assessment is required that assesses the extent to which the carrying out of the proposal would affect the heritage significance of the heritage item. McGarvie Smith Farm is listed as a local heritage item in Schedule 2 of the WPCSEPP. However, while roads are permissible with development consent in all zones, the Transport and Infrastructure SEPP operates to remove these consent requirements.

4.2.4 Heritage Act 1977

The NSW *Heritage Act 1977* (as amended in 2009) was enacted to conserve the environmental heritage of NSW. Under Section 32, places, buildings, works, relics, movable objects or precincts of heritage significance are protected by means of either Interim Heritage Orders (IHO) or by listing on the NSW State Heritage Register (SHR). Items that are assessed as having State heritage significance can be listed on the SHR by the Minister on the recommendation of the NSW Heritage Council.

Under Section 170 of the *Heritage Act 1977*, NSW Government agencies are required to maintain a register of heritage assets. The register places obligations on the agencies, but not on non-government proponents, beyond their responsibility to assess the impact on surrounding heritage items.

Archaeological features and deposits are afforded statutory protection by the 'relics provision'. Section 4(1) of the *Heritage Act 1977* (as amended in 2009) defines 'relic' as follows:

any deposit, artefact, object or material evidence that:

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

(b) is of State or local heritage significance.

The 'relics provision' requires that no archaeological relics be disturbed or destroyed without prior consent from the Heritage Council of NSW. Therefore, no ground disturbance works may proceed in areas identified as having archaeological potential without first obtaining an Excavation Permit pursuant to Section 140 of the *Heritage Act 1977*, or an Archaeological Exception under Section 139 of the *Heritage Act 1977*.

The Heritage Council must be notified of the discovery of a relic under Section 146 of the *Heritage Act 1977*.

4.3 Local environmental plans

Elizabeth Drive West forms the northern boundary of the Liverpool LGA. To the north of Elizabeth Drive West as far east as Mamre Road is the Penrith LGA. The *Liverpool Local Environmental Plan 2008* (Liverpool LEP 2008) and *Penrith Local Environmental Plan 2010* (Penrith LEP 2010) are discussed below.

4.3.1 Liverpool Local Environmental Plan 2008

Part 5, Section 5.10 of the Liverpool LEP 2008 deals with heritage conservation within the area covered by this LEP. All heritage items listed in the LEP are included in Schedule 5. The Liverpool LEP 2008 states:

(1) The objectives of this clause are as follows:

a. to conserve the environmental heritage of Liverpool

- b. to conserve the heritage significance of heritage items and heritage conservation areas, including associated fabric, settings and views,*
- c. to conserve archaeological sites,*
- d. to conserve Aboriginal objects and Aboriginal places of heritage significance.*

(2) Development consent is required for any of the following:

- a. demolishing or moving any of the following or altering the exterior of any of the following (including, in the case of a building, making changes to its detail, fabric, finish or appearance):*
 - i. a heritage item,*
 - ii. an Aboriginal object,*
 - iii. a building, work, relic or tree within a heritage conservation area,*
- b. altering a heritage item that is a building by making structural changes to its interior or by making changes to anything inside the item that is specified in Schedule 5 in relation to the item,*
- c. disturbing or excavating an archaeological site while knowing, or having reasonable cause to suspect, that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed,*
- d. disturbing or excavating an Aboriginal place of heritage significance,*
- e. erecting a building on land:*
 - i. on which a heritage item is located or that is within a heritage conservation area, or*
 - ii. on which an Aboriginal object is located or that is within an Aboriginal place of heritage significance,*
- f. subdividing land:*
 - i. on which a heritage item is located or that is within a heritage conservation area, or*
 - ii. on which an Aboriginal object is located or that is within an Aboriginal place of heritage significance.*

4.3.2 Penrith Local Environmental Plan 2010

Part 5, Section 5.10 of the Penrith LEP 2010 deals with heritage conservation within the area covered by this LEP. Locally significant heritage items in the Penrith LGA are listed in Schedule 5 of the LEP. The clauses listed under Part 5, Section 5.10 of the Penrith LEP 2010 are identical to the clauses specified in Part 5, Section 5.10 of the Liverpool LEP 2008 (described in Section 4.3.1).

Under clause 4.4 (2) of the WPCSEPP, LEP provisions do not apply to the land subject to the WPCSEPP. However, the heritage conservation provisions of the LEPs and their corresponding schedules have been examined in this assessment for completeness.

5.0 Existing environment

This section provides a description of the existing environment, informed by a desktop review.

5.1 Elizabeth Drive description

Within the construction footprint, Elizabeth Drive is a dual-lane carriageway linking Liverpool to the east and the Northern Road at Luddenham to the west. It is bounded to its north largely by rural properties and to its south by the WSA (under construction). The road is a major arterial route linking major roads (such as the Northern Road) and motorways (such as the M7 Motorway). Movement of large plant related to the construction of the WSA has led to temporary traffic control measures, which in turn has led to intermittent high traffic volumes.

5.2 Heritage database searches

A search of heritage databases was carried out for the study area on 14 July 2022, as outlined below and summarised in Table 5-1:

- World Heritage List
- National Heritage List
- Commonwealth Heritage List
- Register of the National Estate (non-statutory)
- State Heritage Register
- Transport Asset Holding Entity (TAHE) Section 170 Heritage and Conservation Register
- Liverpool LEP 2008 Schedule 5
- Penrith LEP 2010 Schedule 5
- State Environmental Planning Policy (Precincts-Western Parkland City) 2021 (WPCSEPP), Schedule 2.

Two listed items of local heritage significance were identified within the study area (shown on Figure 5-1):

- Luddenham Road Alignment – listed under Schedule 5 of Penrith LEP 2010
- McGarvie Smith Farm – listed under Schedule 2 of WPCSEPP. As noted in Section 4.2.3, this item was delisted from Schedule 5 of Penrith LEP 2010.

No heritage conservation areas were identified within the study area.

Table 5-1: Results of heritage database searches

Heritage list	Items within the study area	
	Item	Level of significance
World Heritage List	Nil	N/A
National Heritage List	Nil	N/A
Commonwealth Heritage List	Nil	N/A
Register of the National Estate (non-statutory)	Nil	N/A
State Heritage Register	Nil	N/A
TAHE Section 170 Heritage and Conservation Register	Nil	N/A
Liverpool LEP 2008	Nil	N/A
Penrith LEP 2010 Schedule 5	Luddenham Road Alignment	Local
WPCSEPP Schedule 2	McGarvie Smith Farm (Within construction footprint; however, significant buildings located within the curtilage of the item are located about 115 to 160 metres (closest buildings) from the boundary of the construction footprint and separated from the proposal by an access track)	Local

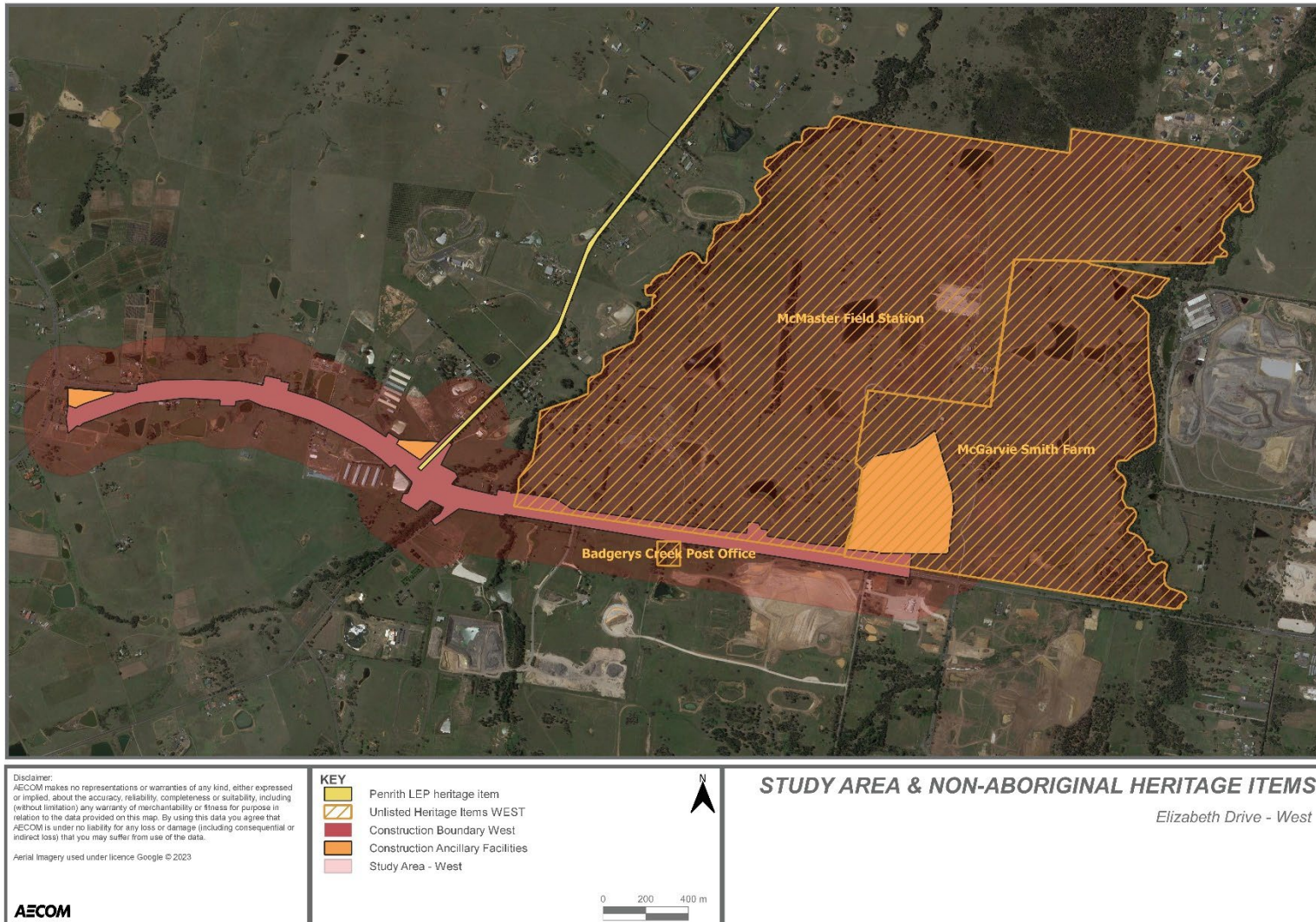


Figure 5-1: Elizabeth Drive West Non-Aboriginal heritage items within the study area

5.3 Literature review

5.3.1 Historical context

The following sections outline the development of Elizabeth Drive and the adjoining areas (the study area). This information has been used to understand the historical context in which it developed and the subsequent factors that have influenced its development.

Early European Settlement

Large land grants began to be made in the Luddenham and Badgerys Creek area from the earliest years of the colony. In the first decade of the 19th century, the study area formed part of a locality broadly known as Bringelly and was mostly unsettled land. However, a number of floods along the Hawkesbury-Nepean in 1809 destroyed grain crops prompting Governor Macquarie to grant large tracts of land to free settlers or military officers in the Bringelly area (Morris & Britton, 2000:13).

The proposal is within or adjacent to three of those land grants made by Governor Macquarie:

- Blaxland's Luddenham Estate
- Henderson Grant
- Johnston Grant.

Relevant information on the above land grants is provided in the following sections.

Land grants

Blaxland's Luddenham Estate

One of the earliest land holders in the study area was John Blaxland, who was granted 6,710 acres in 1813, although he and his brother Gregory appeared to be using the land for grazing since at least 1810. The 1813 grant extended from the Nepean River in the west to Badgerys Creek in the east, with the northern boundary of Bringelly parish forming the northern boundary of the grant (Figure 5-2). Blaxland named his grant "Luddenham" after his ancestral property in England.

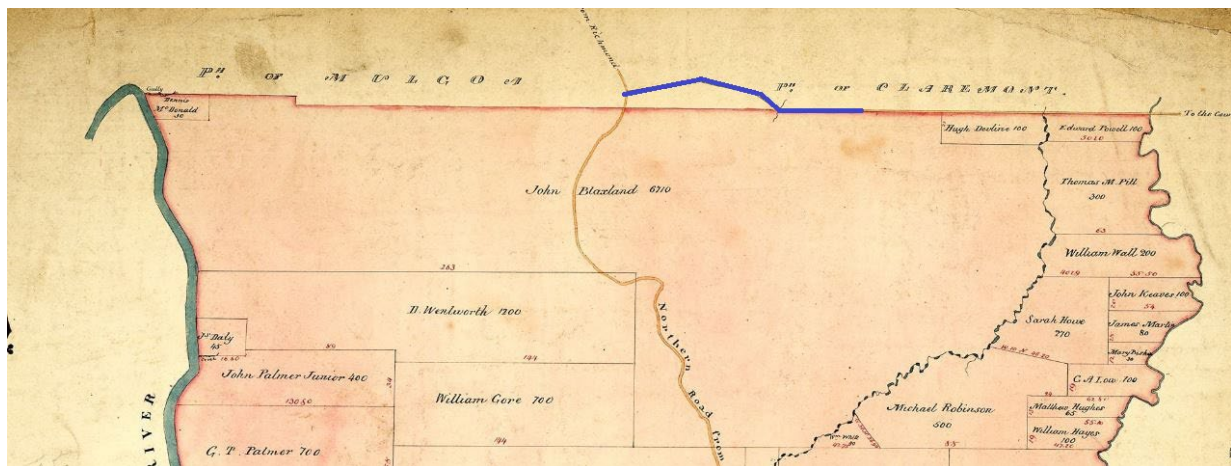


Figure 5-2: Undated parish map of Bringelly showing extent of Blaxland's grant. The approximate location of the Elizabeth Drive West Construction footprint is marked in blue (Courtesy: Historical Land Records Viewer, File name 14071201.jp2)

Macquarie visited Luddenham in 1810, noting:

"Thence we proceeded to Mr Blaxland's own farms, about five or six miles distant from South Creek in a westerly direction. This is entirely as yet a grazing farm, with only a miserable hut for the stock-keepers, and stockyards for the cattle. The land in some parts is tolerably good, and pretty well watered, but is better adapted to grazing than tillage" (Macquarie, 1810).

For many years, Luddenham was used for grazing cattle and sheep while John Blaxland lived at his estate, Newington, on the Parramatta River near present day Homebush. However, by the 1830s he

commenced developing the land, constructing a dam on the Nepean and establishing a flour mill and brewery complex in the west of the grant.

His ambitious plans for expansion led to extensive mortgages over the Luddenham Estate and when he died in 1845, the Australian Trust company sold the Luddenham Estate to Sir Charles Nicholson (O'Sullivan, 1977:2).

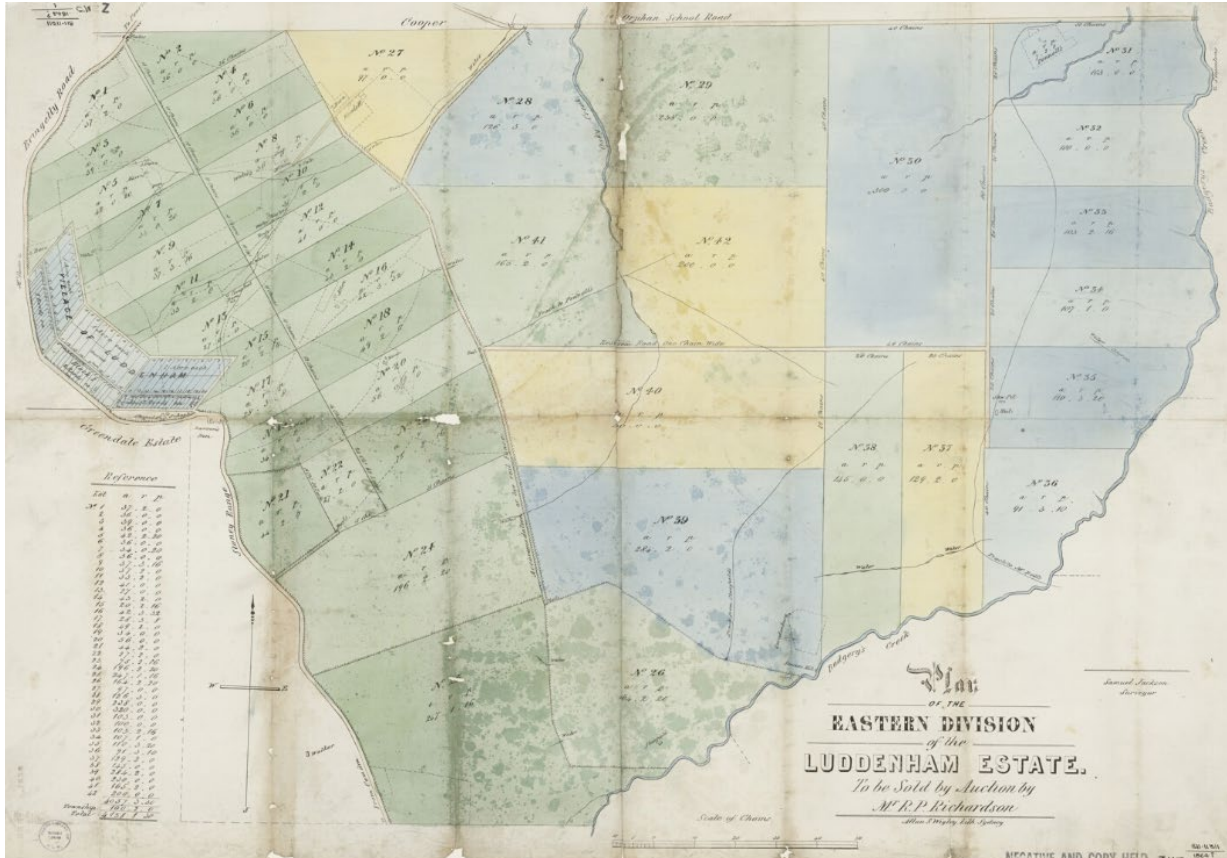


Figure 5-3: Subdivision plan of the Eastern Division of the Luddenham Estate, 1864 (Courtesy: State Library of New South Wales, Call No. Z/M3 811.11311/1864/1)

Nicholson subdivided the Estate into the Eastern, Western and Central portions, with the study area in the Eastern Division. This subdivision was offered for sale for 42 large rural lots from 1859 (Sydney Morning Herald, 1859:8). These lots were subdivided further in the later 19th century, and the village of Badgerys Creek formed in the eastern portion.

Most of the former Blaxland land grant was principally used for agricultural purposes until its resumption by the Commonwealth government and construction for the WSA and Western Sydney Aerotropolis in 2018.

Henderson and Johnston Grants

On 31 August 1819, there were two large grants made to the north of the Luddenham Estate; one of 500 acres to Michael Henderson and another of 500 acres to William Johnston. Michael Henderson was a free settler who had arrived in 1817 with letters from Lord Bathurst to Governor Macquarie (Henderson, 1824). William Johnston was also a free settler; however, after being appointed as Superintendent of Agriculture at Bathurst in 1823, he sold his land to his neighbour to the north, Captain John Piper. Indicative of the low grain stocks at the time, both grants were conditional on at least ten percent of the land being cultivated within seven years of the grant, and both were required to consent to a public road being laid through the grants.

Captain Piper sold his large holding to William Cox in 1831. The Cox family retained ownership of the land until 1859, after which it passed through a number of owners until it was acquired by the University of Sydney (see Section 5.5 below).

Development of Orphan School Road (now Elizabeth Drive)

Forming the boundary running east-west between local government areas and parishes, Elizabeth Drive has been a road since at least the 1820s. In 1826, John Blaxland placed an advertisement in the Sydney Gazette warning that although the Government had constructed two roads through his Luddenham Estate for the benefit of the public, anyone found trespassing on any other part of the Estate would be prosecuted (Blaxland, 1826:1). In 1827, a Grand Jury sitting at Liverpool heard the urgent need for the construction of bridges over a number of waterways:

“...across the new line of road leading through the populous Districts of Cabramatta and Bringelly (past Mr Badgery’s), till its junction with the great North Road, on Mr Blaxland’s estate, as at present on the least fall of rain the residents on that part of the South Creek have no means of getting to either Church or market” (The Australian, 1827).

A bridge gang was despatched later that month to complete “Badgery’s Road through the Orphan School to Bringelly” (The Australian, 1827).

By 1835, the road still had not been named, referred to in the description of the Hundred of Bringelly as “the bridge over Kemp’s Creek on the road from the Cowpasture old road to the northern road” (NSW Government, 1835:347).

By the 1850s, the road had acquired the name ‘Orphan School Road’ and ran from the Old Cow Pastures Road near the Male Orphan School at Bonnyrigg to the Bringelly Road. For around a century, the road was a corduroy road (timber logs laid across the road corridor) and later a gravel road. Bridges were low-lying timber structures with corduroy approaches and subject to flooding (Adams, 1960:11).

In the 1950s, sealing of the road was in progress, with construction of Warragamba Dam an important driver, as it was the quickest route from the east. However, before this could be completed, bridge crossings needed to be raised. By 1960, the road was wholly bitumen-surfaced (Adams, 1960). By this time, the road was known variously as ‘Orphan School Road’, ‘Mulgoa Road’ and ‘Cabramatta-Mulgoa Road’. Liverpool City Council announced on 11 December 1964 that by resolution of council dated 18 June 1963 that Orphan School Road/Mulgoa Road/Cabramatta-Mulgoa Road, being Main Road No. 535, was to be renamed ‘Elizabeth Drive’ (Liverpool City Council, 1964:4158).

In 1996, an Environmental Impact Statement (EIS) was prepared for the upgrade of Elizabeth Drive between Mamre Road in the east and Luddenham Road in the west. The upgrade was designed to complement the proposed WSA at Badgerys Creek, and was to include:

- Replacement of existing two lane road with a four lane divided carriageway
- Excavating a cutting of up to about seven metres depth through Kemps Creek village
- Provision of service roads at Kemps Creek village and east of Mamre Road
- Provision of new bridges over Kemps, South and Badgerys Creek
- Drainage, bicycle lanes and landscaping.

Of the above, works, only the bridge works over South Creek and Badgerys Creek have been constructed to date.

Luddenham Road Alignment

Luddenham Road (the road) dates from the early 1800s, when it was constructed to connect the farms of Gregory Blaxland’s ‘Lee Holm’ (or ‘Leeholme’) estate near St Marys, and John Blaxland’s Luddenham estate (Heritage NSW, 2008). However, it is likely that this was a track until late in the 19th century. The southern end of its alignment is within the operational footprint of the proposal (refer Figure 1-1).

It was reported in 1879 that although the new road from South Creek (St Marys) to Luddenham had been surveyed and marked off, it was not opened (The Cumberland Mercury, 1879:4). The road was eagerly awaited, as it cut the travelling distance between St Marys and Luddenham from 16 miles to six. From its crossing of South Creek south of St Marys, the proposed road travelled south along the western banks of South Creek, before turning in a south westerly direction along the western banks of Cosgroves Creek and meeting up with Orphan School Road (Elizabeth Drive) near Luddenham. It traversed farmland established since the early 19th century (one property being Gregory Blaxland’s ‘Lee

Holm'. Smaller farms (<60 acres) were generally clustered around the confluence of South Creek and Cosgroves Creek (refer Figure 5-4).

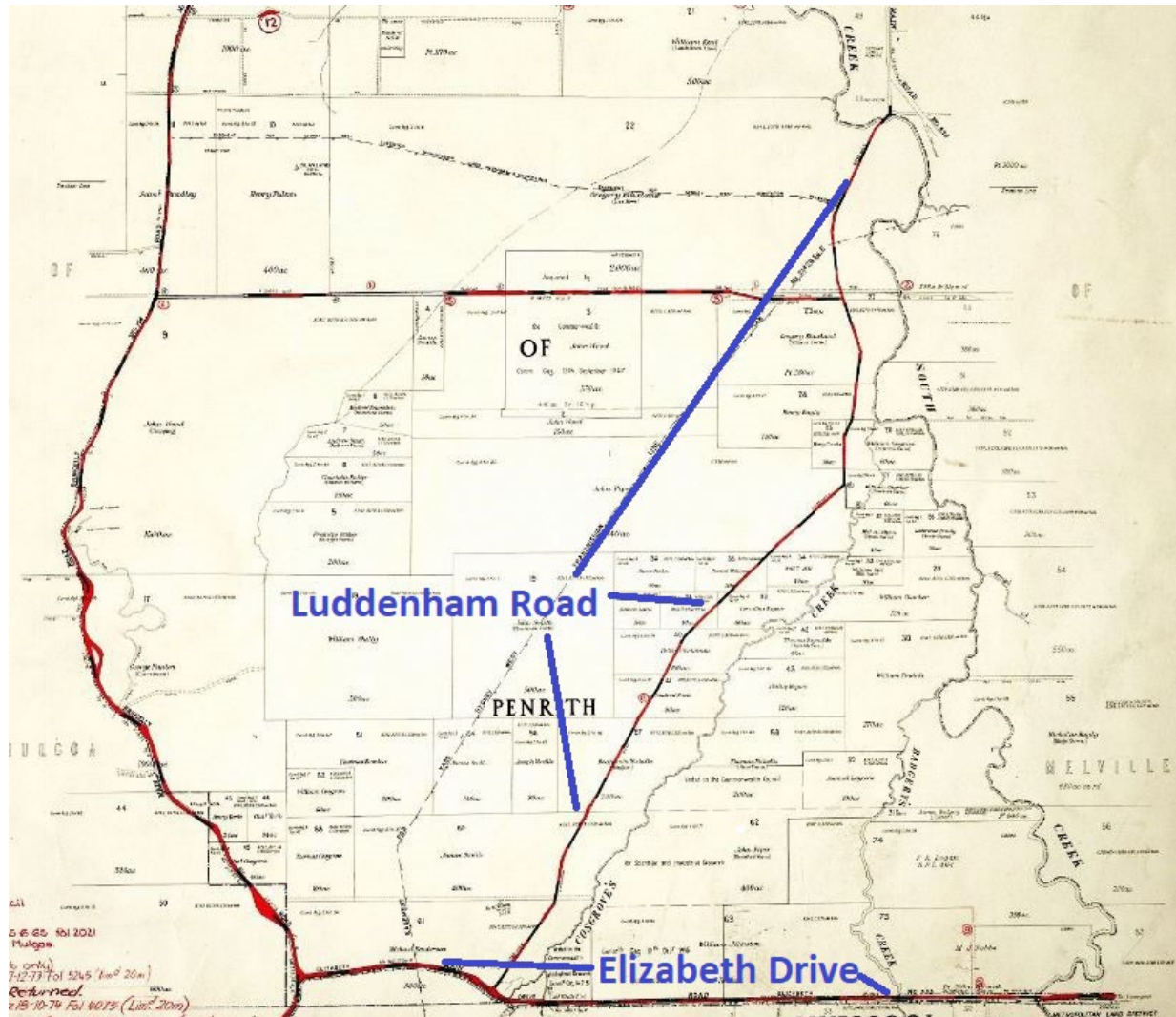


Figure 5-4: Detail of Parish of Claremont dated 1972 showing Luddenham Road Alignment in relation to Elizabeth Drive (Historical Land Records Viewer, File Name 14021601.jp2)

By 1880, the road still had not been opened. Representations made by the local community to Mr Baker, the Minister for Mines, indicated that one landowner, Mr Yorke, had objected to the road because it cut across his paddock and he wanted substantial compensation for it (Sydney Morning Herald, 1880:8). In a letter to the Editor of the Cumberland Mercury, a person with the *nom de plume* of “Justice”, states that York’s property was known locally as the “Filly Paddock” - Henderson’s Grant, where Luddenham Road would join with Orphan School Road (“Justice,” 1886:3; (Figure 5-5). Given the location of York’s property, this would have caused substantial difficulty in completing the road. Mr Baker stated that the government was still considering its position, noting that the Surveyor-General had reported against opening the road (Sydney Morning Herald, 1880:8).

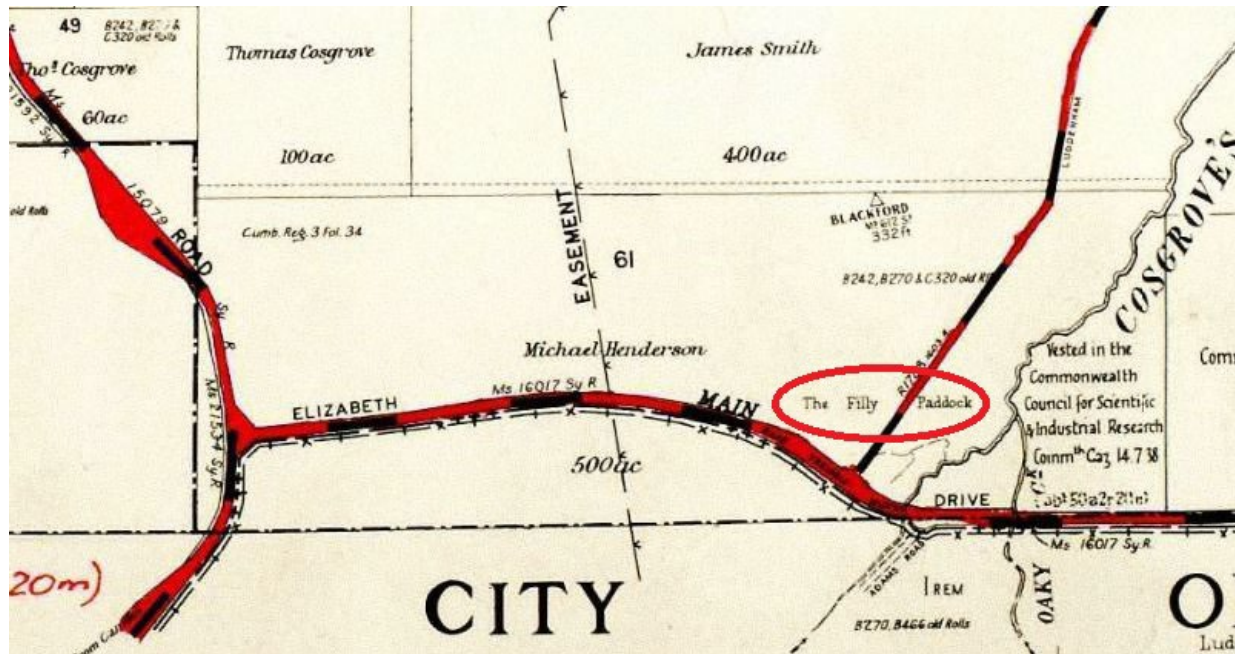


Figure 5-5: Detail of Parish of Claremont, 1972 identifying Michael Henderson's grant as "the Filly Paddock" (Historical Land Records Viewer, File Name 14021601.jp2)

The road was opened in 1886, and as an indication of its importance to the area, the road was also metalled (surfaced with small rocks, rather than left as dirt). However, by the 1920s, the road was in such a poor state of repair that local businesses were avoiding it, preferring to travel the lengthier, 16 mile (25.75 kilometres) route between St Marys and Luddenham (Nepean Times, 1923:6). Funding was granted to the local council in 1924 to improve the road, and the road subsequently was repaired.

The southern section of the Luddenham Road Alignment intersects with Elizabeth Drive, within the construction footprint (refer Figure 1-1).

Badgerys Creek Post Office

After establishing a church and school at Badgerys Creek, the residents of Badgerys Creek petitioned the Postmaster General for a post office (Residents of Badgerys Creek, 1894). A Receiving Office was run from the property of Mr Henry Williams on Orphan School Road, Badgerys Creek from 1894 and in 1896 it was converted to a full post office (Badgerys Creek post office). Mr Williams ran the Badgerys Creek post office from his property until his death in 1916.

In 1916 his widow, Esther Wallis Williams sold the property (and Badgerys Creek post office) to Jack Dey, who took up the role as postmaster. The advertisement for the sale of the property stated that it was:

10 acres Choice Land, situated at Badgerys Creek, fronting Orphan School Road. On the property is erected a comfortable 4 room cottage and kitchen, and all necessary Outbuildings.

Also, in connection with the property, is the Badgerys Creek Post and Telegraph Office, Newsagency and Store. ((Harvey, 1916:5).

The electronic records of the Badgerys Creek Post Office are limited to the years 1894-1915. Other historical data is contained in a separate folder but must be accessed in person via the National Archives of Australia Research Centre at Chester Hill.

However, it is known that at some time in the early decades of the twentieth century, the post office duties were moved to a shop on Badgerys Creek Road, on the corner of Longley's Road (outside the study area) (Donald, 1996:111).

In regards to the location of Badgerys Creek Post Office, a search of historical land records indicates Esther Wallis Williams owned the property contained in Certificate of Title Volume 784 Folio 166 (refer Figure 5-6), which was located on the south-eastern intersection of Orphan School Road (Elizabeth Drive) and Taylors Road (Figure 5-7). This correlates to hand-drawn sketches of the location of the post

office contained in the National Archives electronic file held for Badgerys Creek Post Office (refer Figure 5-7).

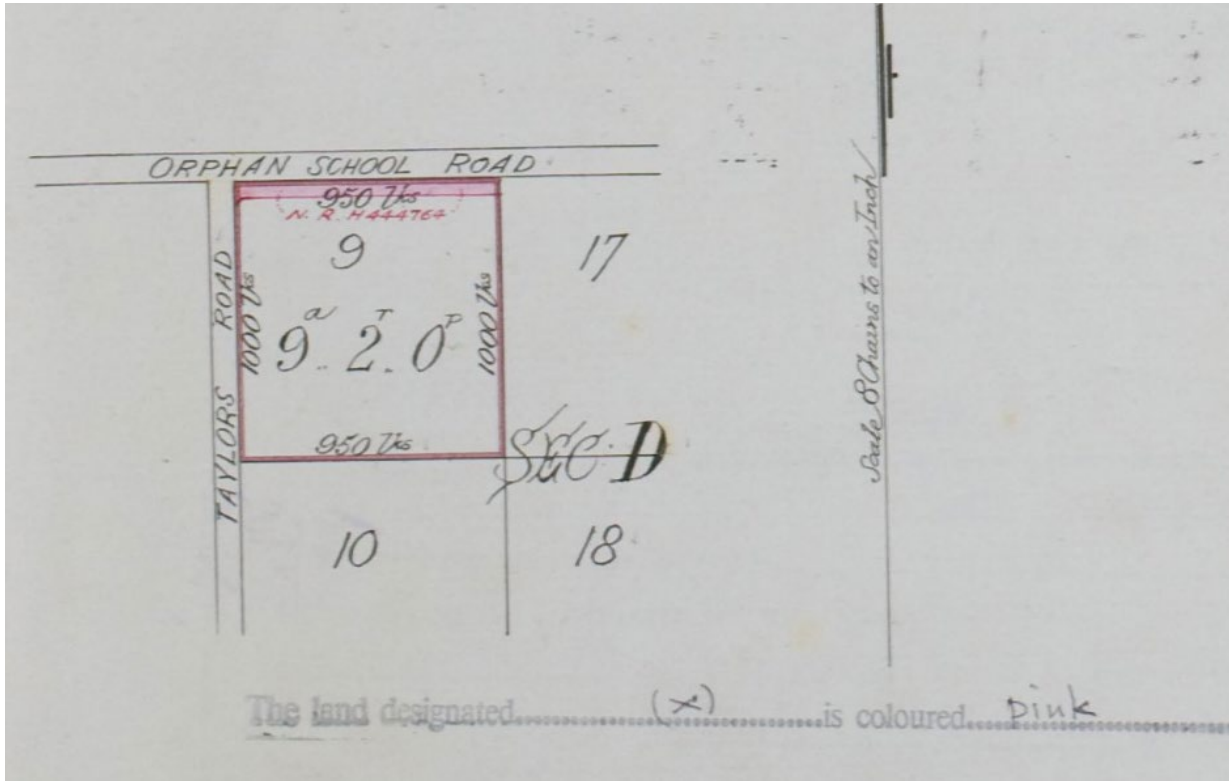


Figure 5-6: Map of Williams' property in Certificate of Title Volume 784 Folio 166 (Historical Land Records Viewer)

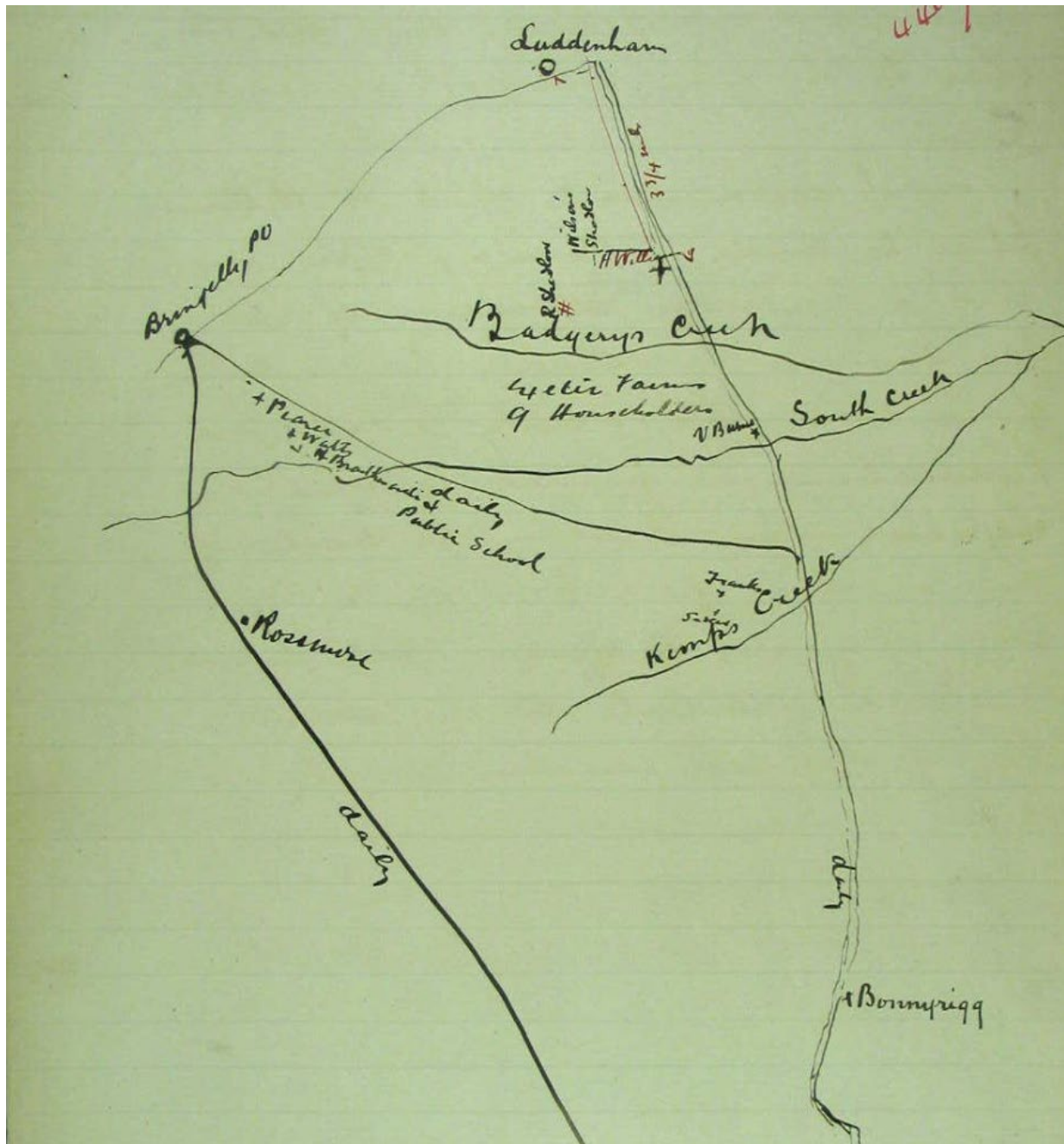


Figure 5-7: Sketch of Badgerys Creek and surrounding suburbs, with Mr Williams' receiving office marked in red with a black cross (National Archives of Australia, Series SP32/1, Item ID 6850025, page 121 of 135)

Based on the literature review, it appears that Badgerys Creek Post Office (the site) was located partially within the footprint of the WSA and partially within the construction footprint. While the land parcel associated with the site is easily identified, the exact location of the former post office within that land parcel is uncertain. However, this site has been significantly altered by construction activities associated with the WSA, and any traces of the Badgerys Creek Post Office have therefore likely been removed.

McMaster Field Station

On 10 December 1936, the Commonwealth Government transferred parts of the former Johnston's (Piper's) farm to the Commonwealth Council for Scientific and Industrial Research (CSIR - now known as the CSIRO) (Commonwealth of Australia, 1936:2220, (refer Figure 5-8). Named for pastoralist and CSIR founding member Sir Frederick Duncan McMaster (1873-1954), the McMaster Field Station was

established as an animal and agricultural research station. Its aim was to research diseases and parasites affecting the pastoral industry, with a particular reference to sheep (NSW Roads and Maritime Services, 2019:95).

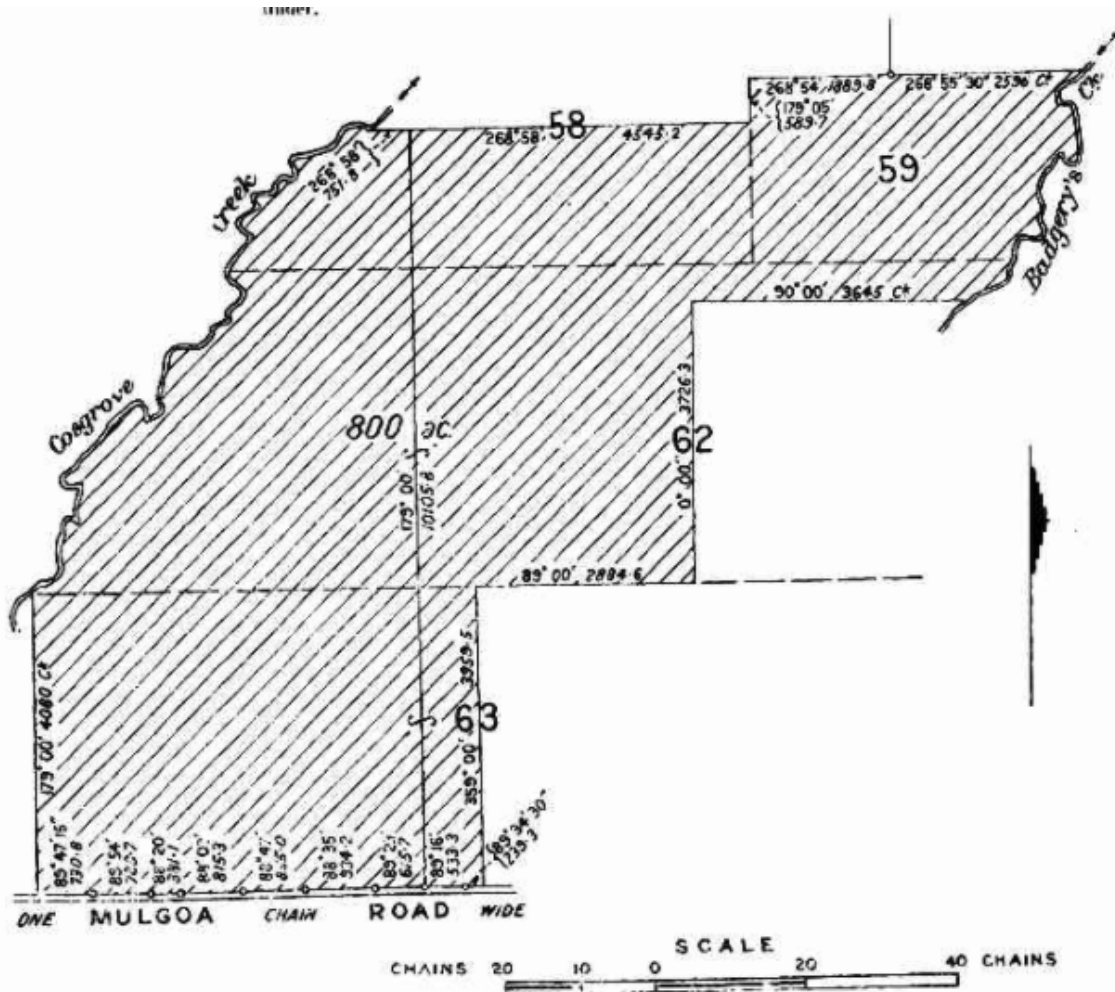


Figure 5-8: Diagram of land transferred to the CSIRO on 10 December 1936. Note Elizabeth Drive is described as “Mulgoa Road” – this section is within the construction footprint (Commonwealth Gazette, 10 December 1936 p. 2220)

Activities on the McMaster Field Station were divided into the following two areas:

- The Division of Animal Health (in the west of the site)
- The Division of Animal Production (in the east of the site).

Figure 5-9 to Figure 5-11 provides a still image, sketch and a list of buildings located within the McMaster Field Station.

Earlier assessments indicated that the McMaster Field Station:

...worked collaboratively with (adjacent) McGarvie Smith, and cultivated fields, built dams, livestock yards, dwellings, farm buildings and other infrastructure such as sheep dips. On the eastern boundary a number of telegraph poles were identified, some complete with their glass or ceramic insulators. One of these insulators, a purple glass, dates from the 1930s and is contemporaneous with the establishment of the farm. It was noted that the landscape was culturally modified for the purposes of CSIRO research (NSW Roads and Maritime Services, 2019:95)



Figure 5-9: Still image of McMaster Field Station taken from Part 1 of a series of five films on CSIR's research facilities, produced for the Commonwealth Scientific Conference held in London in 1946 (Courtesy: CSIRO)

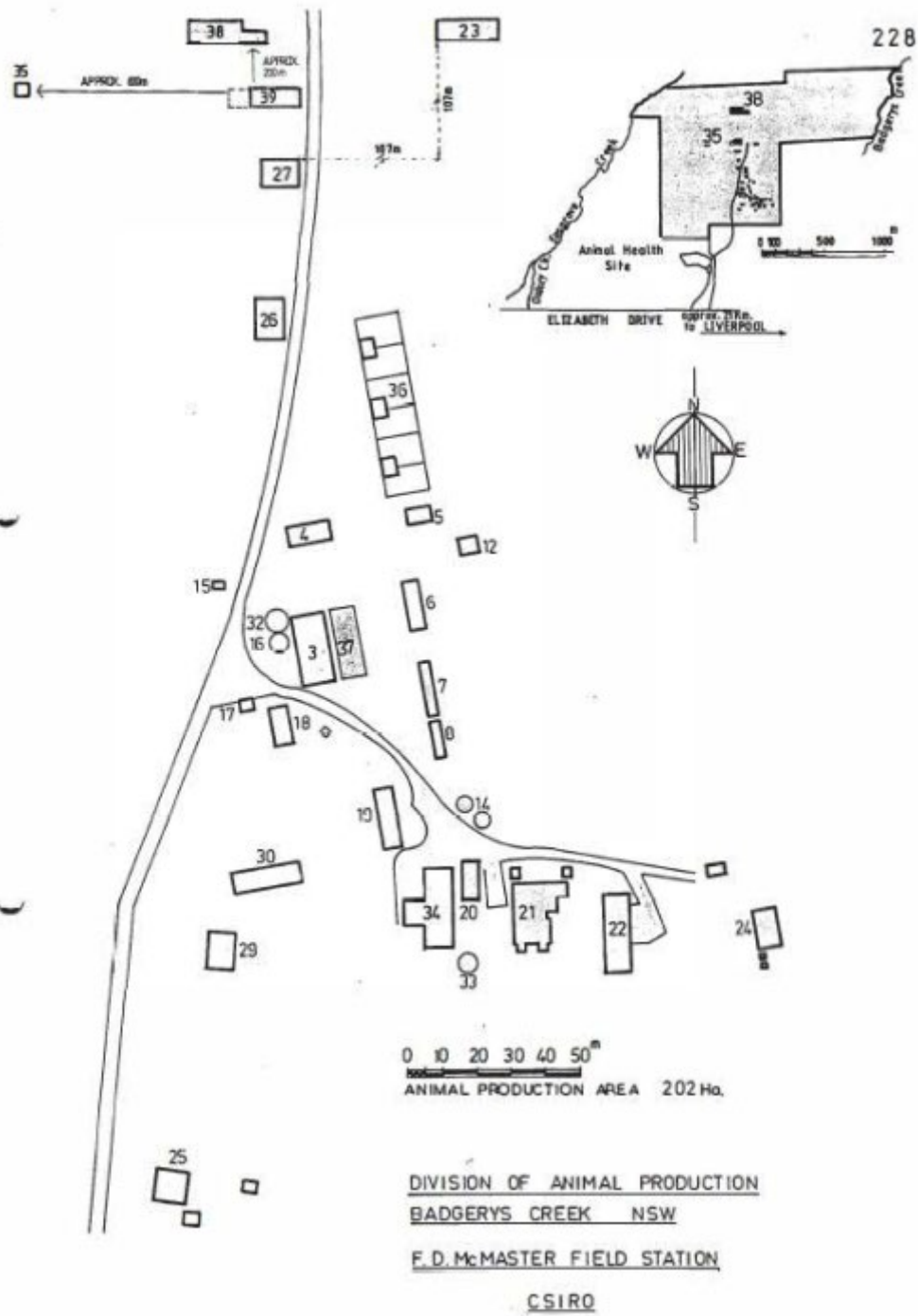


Figure 5-10: Layout of McMaster Field Station, c.1995 (CSIRO in Extent, 2020:102)

Site No: 218
Site Code: BF

BADGERY'S CREEK, NSW

McMaster Laboratory Farm

ANIMAL HEALTH (IAPP)

Tenure: CSIRO Title
Assets Equity: CSIRO
Area of Site: 142Ha
Staff Numbers: 3
No. of Buildings: 24

Bld No	Building	Gross Area in sq m	Construction	Levels	Year Built
1	Laboratory	238.00	Brick	1	1966
1A	Buffier Memorial Laboratory	150.00	Weatherboard	1	1938
2	Implement Shed/Workshop	100.00	Corr GI	1	1961
2A	4BR Residence	186.00	Weatherboard	1	1939
3	Sheep Yards	180.00	Corr GI	1	1957
4	Sheep Shed	27.87	AC Sheet	1	1960
5	Sheep/Shearing Shed	420.00	Corr GI	1	1963
5A	Sheep Shed	270.00	Corr GI	1	1980
6	Flammable Liquid Store	6.00	Brick	1	1961
8	Pump House	5.95	Corr GI	1	
9	Pump House	5.95	Corr GI	1	
10	Pump House	5.95	Corr GI	1	
11 w	House (Superintendent)	136.00	Brick Veneer	1	1966
12/12A	Small Animal Building	479.00	Brick	1	1975
13	Cold Room	6.00	Aluminium	1	1971
14	Hayshed	200.00	Corr GI	1	1971
15	Sheep Shed	90.00	Corr GI	1	1975
16	Glasshouse	85.00	Steel/Glass	1	1975
17	Covered Sale Yards	250.00	Corr GI	1	1969
18	Incinerator	60.00	Brick Veneer	1	1979
19	Sheep Shelter	90.00	Corr GI	1	1972
20	Sheep Shelter	90.00	Corr GI	1	1972
21	Farm Machinery Shed	110.00	Corr GI	1	1977
22	Storage Shed	110.00	Corr GI	1	1976
23	Water Storage/Pump House	18.00	Steel	1	1980
24	Chaff Cutting Building	72.00	Corr GI	1	1982
25	Flammable Liquids Store	30.00	Brick	1	
Total Area of Buildings:		3,661.72	sq m		

Figure 5-11: List of buildings at McMaster Field Station (CSIRO in Extent, 2020:101)

The McMaster Field Station was in operation until 2004, when it was sold to the Medich family. It is now owned by BHL Group.

The McMaster Field Station curtilage is partially located within the construction footprint; however, the significant buildings are located about 350 metres north of the proposal (refer Figure 5-1).

McGarvie Smith Farm

Adjacent and to the east of the McMaster Field Station is McGarvie Smith Farm. The McGarvie Smith Farm was established in 1936 as a collaboration between the McGarvie Institute and the University of Sydney in order to teach students veterinary science and animal husbandry (RPS Manidis Roberts Pty Ltd, 2016:32). Land for the McGarvie Smith Farm was purchased by the University in 1936 with funds from the McGarvie Institute and opened in 1938 (refer to Figure 5-12).

Described in 1995 as "The Badgerys Creek Centre", it comprised the McGarvie Smith Farm and Fleurs, an adjacent 153 hectares purchased by the University in 1977. Fleurs was once the home of Nicholas Bayly and is the site of both the Fleurs Aerodrome and Fleurs Radio Telescope heritage features (refer to the Elizabeth Drive East Heritage Impact Assessment) (University of Sydney, 1995:5).



Figure 5-12: Opening of McGarvie Smith Farm in 1938 (Courtesy: University of Sydney Archives, ID G3_224_0935)

In the 1940s and 1950s, the focus of activities on the farm expanded to include the application of science to farm management. Owing to unpredictable rainfall in the Badgerys Creek area, the work of H J Geddes also became a focus:

Under Geddes a system of containing water on the farm for use during dry periods was developed. This became the basis for a system that had international application and is still in use. The facility also tested P A Yeoman's keyline design that sought to optimise irregular rainfall through gradual release into the soil by landscape design. The favourable results of the testing encouraged the wider use of the system to the extent that it became a key concept in Permaculture (Extent Heritage, 2020:95).

Other activities included experiments with fodder crops as well as the testing and refinement of irrigation equipment (Extent Heritage, 2020:95).

The McGarvie Smith Farm is located within the construction footprint; however, the significant buildings associated with the McGarvie Smith Farm are located adjacent to, but outside the construction footprint (refer to Figure 5-1).

5.3.2 Review of previous assessments

Since the announcement of the WSA in 2014, multiple non-Aboriginal heritage assessments have been carried out in and around the construction footprint. These studies have primarily related to the WSA footprint and access roads in the vicinity; however, assessment of the land comprising the construction footprint has been included in most of these studies. Where relevant to the literature review of this HIA, these have been reviewed and outlined below.

M12 Non-Aboriginal Heritage Assessment Report, Jacobs Group (Australia) Pty Ltd, 2019

The M12 Non-Aboriginal Heritage Assessment Report (the assessment) was carried out by Jacobs as part of the Environmental Impact Statement (EIS) for the proposed M12 Motorway, linking the M7 Motorway with the Northern Road, with access to the WSA. The assessment covered the entirety of the M12 Motorway footprint, assessing listed and potential non-Aboriginal heritage items that may be impacted by the proposed M12 Motorway.

The assessment identified the following listed or potential items of heritage significance within the footprint of the proposed M12 road corridor:

- McGarvie Smith Farm, local heritage item listed on the WPCSEPP Schedule 2 (within construction footprint)
- Luddenham Road Alignment, local heritage item listed on the Penrith LEP 2010 Schedule 5 (within construction footprint)
- McMaster Field Station, not listed, however item of potential heritage significance as identified in previous assessments (within construction footprint)
- Fleurs Radio Telescope site, local heritage item on the WPCSEPP Schedule 2 (outside of study area)
- Fleurs Aerodrome, unlisted item of local heritage significance (outside of study area)
- James Badgery's Exeter Farm site, unlisted item of local heritage significance (outside of study area)
- South, Kemps and Badgerys Creek Confluence Weirs Scenic Landscape, unlisted item of local heritage significance (outside of study area).

Of the items within or adjacent to the construction footprint, it was concluded that construction of the proposed M12 Motorway would have a major adverse impact on the heritage value of McGarvie Smith Farm and McMaster Field Station. In relation to the McGarvie Smith Farm, several buildings (6, 7 and 8; silo) will be demolished as well as an irreversible impact to the existing landscape. In relation to McMaster Field Station, several dams, modified landscape elements and trees will be demolished. In addition, it was assessed that as the proposed M12 bisects the McMaster Field Station, its entire landscape context would be destroyed. It should be noted that both the project footprints of the M12 Motorway and this project footprint have the following items within their boundaries:

- McGarvie Smith Farm
- Luddenham Road Alignment.

In part, it was recommended that collaboration take place between the WSA and Sydney Metro Western Sydney Airport projects, and Transport in relation to design elements and themes in order to develop an integrative design approach (NSW Roads and Maritime Services, 2019).

M12 Motorway – Non-Aboriginal Photographic Archival Recording Report, Artefact Heritage, 2022

The M12 Motorway – Non-Aboriginal Photographic Archival Recording Report (the report) was prepared on behalf of Transport ahead of the construction of the M12 Motorway. It comprises a photographic record of the non-Aboriginal heritage items that may be impacted by the construction of the M12 Motorway and includes the McGarvie Smith Farm and McMaster Field Station, and the Fleurs Radio Telescope site and Fleurs Aerodrome (this item is located outside the study area). Each site recording includes a historical background review, significance assessment, a physical description, mapping and photographs.

An archival recording of McMaster Field Station shows that in 1988, it had 30 operational buildings, decreasing slightly to 24 by 1995. In 1995 it was noted that the earliest building on the site was a weatherboard laboratory constructed in 1938, and the latest a corrugated metal chaff cutting building in 1982. Most of the buildings had been constructed in the 1960s and 1970s. There are now 21 surviving buildings and other elements considered to be of heritage significance.

The archival recording of McGarvie Smith Farm indicates 13 buildings and other structural elements that are of heritage significance. Some of these buildings are within the M12 Motorway footprint (Sheds 1 and 2, concrete silo and McGarvie Smith Farm buildings 6, 7 and 8). Three others are located outside and to the west of the M12 Motorway footprint (McGarvie Smith Farm Buildings 1, 2 and 3). McGarvie Smith Farm Buildings 10, 11 and 12 are outside and to the east of the M12 Motorway footprint and adjacent to the construction footprint.



Figure 5-13: McGarvie Smith Farm buildings in relation to the M12 Motorway footprint (in yellow) (Artefact Heritage Pty Ltd, 2022:23)

Sydney Metro – Western Sydney Airport: Non-Aboriginal Heritage, Artefact Heritage, 2020

Sydney Metro – Western Sydney Airport: Non-Aboriginal Heritage assessment (the assessment) was prepared by Artefact on behalf of the Sydney Metro Authority ahead of the proposed construction of a rail link between St Marys and the WSA. The assessment covered non-Aboriginal heritage outside and within the WSA, including land comprising the construction footprint (referred to as “Off-airport construction corridor” in Artefact, 2020).

The assessment identified McMaster Field Station, McGarvie Smith Farm and Luddenham Road as listed items of heritage significance. It did not identify any additional items of potential heritage significance in the vicinity of the construction footprint. The assessment found that the proposed rail link passed through McGarvie Smith Farm and would cause an overall major impact through demolition of sheds and buildings 10 and 11, and an irreversible visual impact to the rural farming landscape.

It was assessed further that the proposed rail link passes through the eastern margin of McMasters Farm and would cause a moderate impact through removal of significant elements such as one remnant dam and two former feeder troughs. Indirect impacts. As with the visual impacts on McGarvie Smith, Farm, the Sydney Metro project was assessed as having irreversible visual impact to the rural farming landscape of McMaster Field Station.

In relation to the Luddenham Road Alignment, a proposed viaduct crossing over Luddenham Road was assessed as having no impact to its heritage significance as the alignment was not to be altered. However, it was considered to have a minor visual impact on the surrounding rural landscape of the Luddenham Road Alignment.

It was recommended that movable heritage items be identified and assessed, and a significant fabric salvage schedule prepared by a qualified and experienced heritage specialist for McGarvie Smith Farm. (Artefact, 2020).

Western Sydney Aerotropolis Initial Precincts: Draft Aboriginal and non-Aboriginal Cultural Heritage Assessment, Extent, 2020

The Western Sydney Aerotropolis Initial Precincts assessment (the assessment) was prepared to provide a strategic overview of built, Aboriginal and non-Aboriginal heritage values associated with the WSA. It comprises a high-level analysis of key heritage issues.

The following properties within the construction footprint were identified as potentially containing State significant archaeological deposits:

- McMaster Field Station – not listed; however, item of potential heritage significance as identified in previous assessments (within the construction footprint)
- McGarvie Smith Farm – local heritage item listed on the WPCSEPP Schedule 2 (within the construction footprint).

Other items identified outside, but nearby to the study area include:

- Fleurs Radio Telescope Site – local heritage item on the WPCSEPP Schedule 2
- James Badgery's Exeter Farm site – unlisted potential archaeological site of local heritage significance.

The assessment by Extent recommended that development in and around heritage items should accommodate retention and adaptive reuse of historic features. It recommended further that the significant elements of larger sites, such as the McGarvie Smith Farm be conserved and used within a new planned landscape.

European and Other Heritage Technical Report, RPS Australia East Pty Ltd, 2016

The European and Other Heritage Technical Report (the assessment) was prepared to support the EIS for the WSA. The assessment covered the entire WSA footprint, assessing listed and potential non-Aboriginal heritage items. Most of the footprint covered the Eastern Division of Blaxland's grant, and the southern boundary of the construction footprint.

The assessment identified two heritage items in the construction footprint, being the McMaster Field Station and the McGarvie Smith Farm. However, as both of these items were outside of the airport precinct, limited assessment was made.

5.3.3 Archaeological potential

The land immediately south and north of Elizabeth Drive is part of a historic rural landscape, with large parcels owned by well-known colonial figures since the early 19th century. However, land use since that time has mostly been agricultural, resulting in a low potential for significant archaeological deposits to remain within the study area.

In addition, Elizabeth Drive has been graded and widened numerous times since the early 19th century, which is likely to have removed any archaeological deposits along the roadside. It is still possible that the remains of unrecorded structures along the Elizabeth Drive alignment may occur, including the remains of the former Badgerys Creek Post Office; however, that potential is assessed as low. Other potential archaeological remains include former roadside dwellings and/or shops or remains of culvert crossings at Cosgroves Creek. The significance of any such remains is, therefore, likewise predicted to be low. However, any unexpected significant archaeological deposits that are identified within the construction footprint during construction should be managed as per the *EMF-HE-PR-0076 Unexpected Heritage Items Procedure 2022* (Transport for NSW, 2022).

Non-significant archaeological deposits, such as former road surfaces on Elizabeth Drive and Luddenham Road, may also be uncovered during construction. These former bitumen road surfaces are not considered to be significant archaeological deposits and would not require works to stop as per Transport's NSW *EMF-HE-PR-0076 Unexpected Heritage Items Procedure 2022* (Transport for NSW, 2022). However, any original non-bitumen road surfaces, such as stones etc may be of local heritage significance and the *EMF-HE-PR-0076 Unexpected Heritage Items Procedure 2022* (Transport for NSW, 2022) would be followed.

5.4 Visual inspection

A visual inspection of the study area was carried out by AECOM Senior Heritage Consultant, Deborah Farina and AECOM heritage consultant, Tilly Stevens, on 17 June 2022. The site visit included a general vehicular survey and a targeted pedestrian survey of the following heritage sites:

- Luddenham Road Alignment
- McGarvie Smith Farm.

The location of the Badgerys Creek Post Office as indicated in the literature review (eastern intersection of Taylors Road and Elizabeth Drive), is now part of a roundabout constructed on Elizabeth Drive. Taylors Road appeared to be closed/no longer an existing road. It is also noted that the site has been significantly reconfigured by construction works associated with the WSA. Photographs of this site were not able to be taken owing to heavy traffic conditions and safety issues, such as the absence of safe parking and pedestrian thoroughfares along Elizabeth Drive.

Although the property comprising McMaster Field Station is located partially within the construction footprint, the buildings comprising its heritage values are located about 350 metres north of the construction footprint. As these buildings are located at a distance from the construction footprint, the buildings would not be impacted by the proposal. The McMaster Field Station was therefore not included in the visual site inspection.

5.4.1 Luddenham Road Alignment

A visual inspection of the Luddenham Road Alignment (the road) was carried out between the intersection with Elizabeth Drive and 50 metres to the north. The road has a single lane in each direction, and gravel shoulders. There were construction works taking place along the eastern side of the road at the time of the visual site inspection (refer Figure 5-14). The southern extent of the Luddenham Road Alignment was identified as extending into the construction footprint at the intersection of Elizabeth Drive.



Figure 5-14: Luddenham Road, looking south towards intersection with Elizabeth Drive (AECOM, 2022)

5.4.2 McGarvie Smith Farm

A visual inspection of the McGarvie Smith Farm was carried out from within the property.

The construction footprint encroaches into part of the McGarvie Smith Farm property; however, the significant buildings are located adjacent to, but outside of the construction footprint. In addition, all buildings have recently been archivally recorded as part of the M12 Motorway project.

The McGarvie Smith Farm buildings located immediately outside the construction footprint were identified as being in a dilapidated condition. The buildings on the north-east of the site boundary (corresponding to McGarvie Smith 10, McGarvie Smith 11 and McGarvie Smith 12 in Figure 5-13; located 160 metres, 154 metres and 115 metres outside the construction footprint, respectively) appear to be former dwellings in poor condition surrounded by overgrown vegetation (refer Figure 5-15 - Figure 5-17).



Figure 5-15: McGarvie Smith 10 (AECOM, 2022)



Figure 5-16: McGarvie Smith 11 (AECOM, 2022)



Figure 5-17: McGarvie Smith Farm 12 (AECOM, 2022)

The McGarvie Smith Farm buildings to the north of the construction footprint (corresponding to McGarvie Smith 6, McGarvie Smith 7 and McGarvie Smith 8; located 44 metres, 64 metres and 97 metres outside the construction footprint, respectively) were in a similar condition. McGarvie Smith 6 and 7 both appear to be residential buildings in poor condition, while McGarvie Smith 8 is a former dairy shed (Artefact Heritage Pty Ltd, 2022:22) (Figure 5-18).



Figure 5-18: McGarvie Smith Farm (L-R) 6, 7 and 8 (AECOM, 2022)

Buildings further to the north of the construction footprint (Sheds 1 and 2, concrete silo; located 35 metres, 17 metres and 39 metres outside the construction footprint, respectively) were located at a greater distance from the construction footprint and were not visited. Buildings to the north-west of the construction footprint (McGarvie Smith 1-3 – see Figure 5-19 and Figure 5-20) are located on the western side of an access track from Elizabeth Drive to the McMaster Field Station Buildings. Although part of that access track is within the curtilage of the McGarvie Smith Farm, the gate to that access track is locked at its Elizabeth Drive entrance and permission from the owners of the McMaster Field Station (BHL) was required. Owing to the uncertainty of access to McGarvie Smith Farm 1-3 (located 25 metres, 17 metres and 50 metres outside the construction footprint, respectively), these buildings were not visited. However, as the buildings are separated from the construction footprint by a private access track, it is considered that these buildings are unlikely to be impacted by the proposal.



Figure 5-19: (L-R) McGarvie Smith Farm 1 and 2 (AECOM, 2022)

The visual inspection of McGarvie Smith Farm buildings confirmed the observations made by the M12 Motorway – Non-Aboriginal Photographic Archival Recording Report (2022, Artefact) in its photographic recording. Despite their poor condition, the McGarvie Smith Farm buildings adjacent to the proposal range in significance from high (McGarvie Smith 1 and 2), moderate (McGarvie Smith 6, 7, 8, 10 and 12) and little (McGarvie Smith 11). However, these buildings are located outside the construction footprint and, therefore, would not be directly impacted.

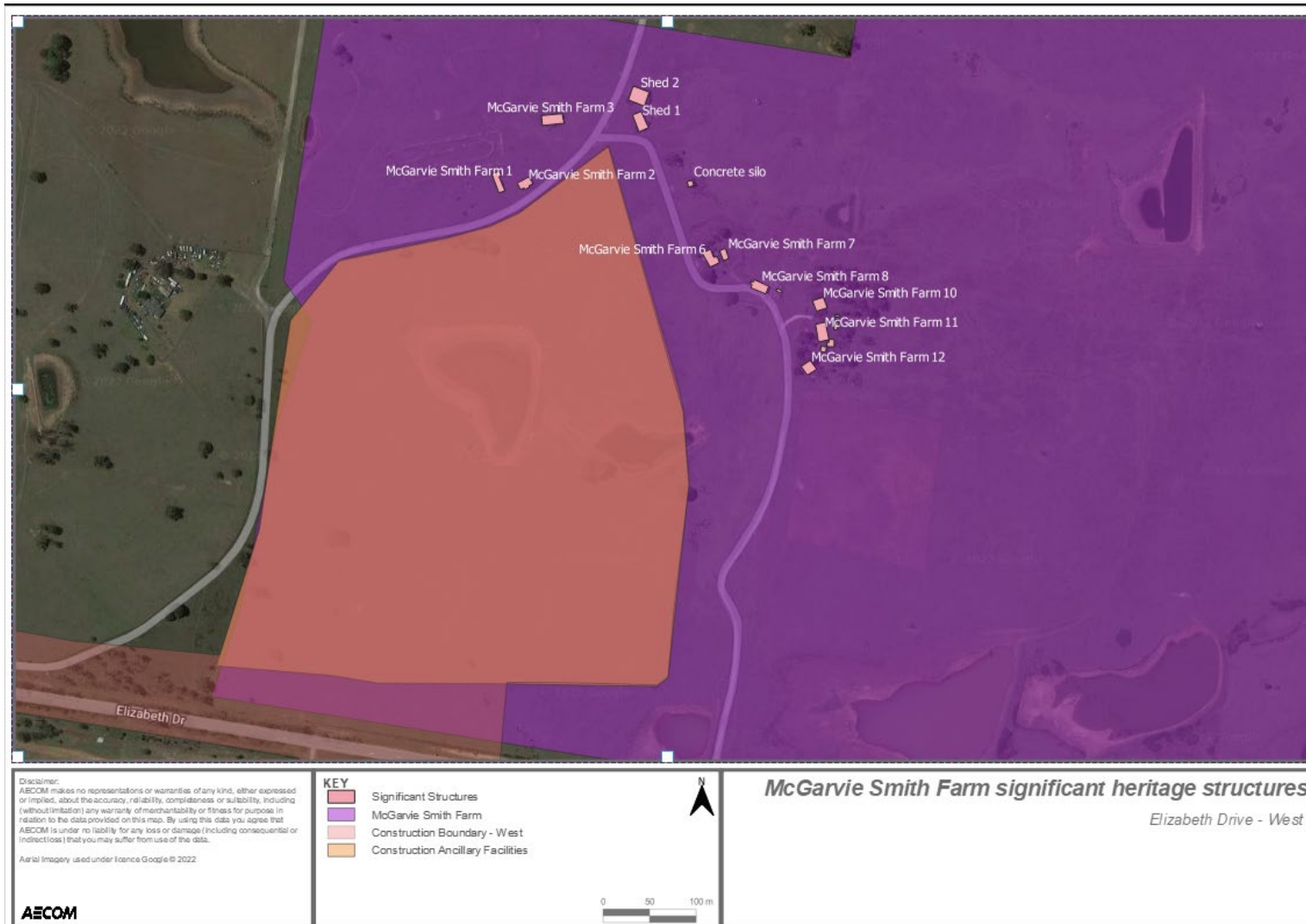


Figure 5-20: McGarvie Smith Farm and the construction footprint (orange). The purple layer represents the heritage curtilage for McGarvie Smith Farm, with the significant buildings labelled (AECOM, 2022)

6.0 Significance assessment

6.1 Introduction

To understand how a development would impact on a heritage item, it is essential to understand why an item is significant. An assessment of significance is carried out to explain why a particular item is important and to enable the appropriate site management and curtilage to be determined. Cultural significance is defined in *The Australia ICOMOS Charter for Places of Cultural Significance 2013* (ICOMOS (Australia), 2013) as meaning "aesthetic, historic, scientific, social or spiritual value for past, present or future generations" (Article 1.2). Cultural significance may be derived from a place's fabric, association with a person or event, or for its research potential. The significance of a place is not fixed for all time, and what is of significance to us now may change as similar items are located, more historical research is carried out, and community tastes change.

The process of linking this assessment with an item's historical context has been developed through the NSW Heritage Management System and is outlined in the guideline *Assessing Heritage Significance* (NSW Heritage Office, 2001), part of the NSW Heritage Manual (Heritage Branch, Department of Planning). The *Assessing Heritage Significance* guidelines establish seven evaluation criteria (which reflect four categories of significance and whether a place is rare or representative) under which a place can be evaluated in the context of State or local historical themes. Similarly, a heritage item can be significant at a local level (ie, to the people living in the vicinity of the site), at a State level (ie, to all people living within NSW) or be significant to the country as a whole and be of National or Commonwealth significance.

In accordance with the guideline *Assessing Heritage Significance*, an item would be considered to be of State significance if it meets two or more criteria at a State level, or of local heritage significance if it meets one or more of the criteria outlined in Table 6-1. The Heritage Council requires the summation of the significance assessment into a succinct paragraph, known as a Statement of Significance. The Statement of Significance is the foundation for future management and impact assessment.

Table 6-1 Significance assessment criteria

Criterion	Inclusions/exclusions
Criterion (a) – an item is important in the course, or pattern, of NSW's cultural or natural history (or the cultural or natural history of the local area).	The site must show evidence of significant human activity or maintains or shows the continuity of historical process or activity. An item is excluded if it has been so altered that it can no longer provide evidence of association.
Criterion (b) – an item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history (or the cultural or natural history of the local area).	The site must show evidence of significant human occupation. An item is excluded if it has been so altered that it can no longer provide evidence of association.
Criterion (c) – an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the local area).	An item can be excluded on the grounds that it has lost its design or technical integrity or its landmark qualities have been more than temporarily degraded.
Criterion (d) – an item has strong or special association with a particular community or cultural group in NSW (or the local area) for social, cultural or spiritual reasons.	This criterion does not cover importance for reasons of amenity or retention in preference to a proposed alternative

Criterion	Inclusions/exclusions
Criterion (e) – an item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area). Significance under this criterion must have the potential to yield new or further substantial information.	Under the guideline, an item can be excluded if the information would be irrelevant or only contains information available in other sources.
Criterion (f) – an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the cultural or natural history of the local area).	An item is excluded if it is not rare or if it is numerous, but under threat. The item must demonstrate a process, custom or other human activity that is in danger of being lost, is the only example of its type or demonstrates designs or techniques of interest.
Criterion (g) – an item is important in demonstrating the principal characteristics of a class of NSW's (or local area's): <ul style="list-style-type: none"> cultural or natural places cultural or natural environments. 	An item is excluded under this criterion if it is a poor example or has lost the range of characteristics of a type.

6.2 Significance assessment of Luddenham Road Alignment

The significance assessment of Luddenham Road Alignment is presented in Table 6-2. This significance assessment has been taken from the State Heritage Inventory.

Table 6-2 Significance assessment of Luddenham Road Alignment

Significance Criteria	Application of Criteria (Existing Assessment)
Historical significance SHR criteria (a)	<i>Luddenham Road provides evidence of the early nineteenth century pastoral activities in the Penrith region, connecting the estates of Luddenham and Lee Holme owned by brothers John and Gregory Blaxland respectively. It continued to be an important link through the nineteenth century, connecting Bringelly with St Marys.</i> <i>The sparsely settled landscape around Luddenham Road and the surviving post and rail fencing continues to provide evidence of the predominant pastoral activities in the district in the nineteenth century through to the present time (2008).</i>
Historical association significance SHR criteria (b)	<i>There are no associative values attached to this item.</i>
Aesthetic/technical significance SHR criteria (c)	<i>The continuing rural character of Luddenham Road, characterised by the undulating traverse of the road, sparsely settled pastoral land and surviving timber post and rail fencing gives the road a high level of aesthetic appeal.</i>
Social significance SHR criteria (d)	<i>There is no social significance attached to this item.</i>
Research significance SHR criteria (e)	<i>There is no research significance attached to this item.</i>
Rarity SHR criteria (f)	<i>There no rarity values attached to this item.</i>
Representativeness SHR criteria (g)	<i>The item is highly representative of a sealed, suburban road.</i>

Significance Criteria	Application of Criteria (Existing Assessment)
Integrity/Intactness	<i>The route of the road and the surrounding pastoral landscape is intact. Unusually long stretches of timber post and rail fencing survive on the sides of the road.</i>
Statement of Significance	<p><i>Luddenham Road provides evidence of the early nineteenth century pastoral activities in the Penrith region, connecting the estates of Luddenham and Lee Holme owned by brothers John and Gregory Blaxland respectively. It continued to be an important link through the nineteenth century, connecting Bringelly with St Marys.</i></p> <p><i>The sparsely settled landscape around Luddenham Road and the long surviving post and rail fencing continue to provide evidence of the predominant pastoral activities in the district in the nineteenth century through to the present time (2008) and give the road a high level of aesthetic appeal</i></p>

6.3 Significance assessment of McGarvie Smith Farm

The significance assessment of McGarvie Smith Farm is presented in Table 6-3. This assessment has been taken from the State Heritage Inventory.

Table 6-3 Significance assessment of McGarvie Smith Farm

Significance Criteria	Application of Criteria (Existing Assessment)
Historical significance SHR criteria (a)	<i>The McGarvie Smith farm has interest as a veterinary research centre for Sydney University since 1936.</i>
Historical association significance SHR criteria (b)	<i>There is no associative value attached to this item.</i>
Aesthetic/technical significance SHR criteria (c)	<i>The c.1936 buildings are representative examples of Inter-War design applied to rural research buildings. The office building uses good proportions in a symmetrical design composed of primary and secondary roof forms and regular door and window openings. The scale, proportions and regular pattern of openings is continued in the less formal student accommodation building.</i>
Social significance SHR criteria (d)	<i>There is no social significance attached to this item.</i>
Research significance SHR criteria (e)	<i>There is no research value attached to this item.</i>
Rarity SHR criteria (f)	<i>These buildings are the only known example of rural research buildings in the Penrith City Area.</i>
Representativeness SHR criteria (g)	<i>These buildings are not representative.</i>
Integrity/Intactness	<i>Apart from damage due to neglect, the 1936 buildings on this farm appear to have been little altered since they were constructed.</i>

Significance Criteria	Application of Criteria (Existing Assessment)
Statement of significance	<p><i>The McGarvie Smith Farm has interest as a veterinary research centre for Sydney University since 1936. These buildings are the only known example of rural research institution buildings in the Penrith City Council area.</i></p> <p><i>The c.1936 buildings are representative examples of Inter-War design applied to rural research buildings. The office building uses good proportions in a symmetrical design composed of primary and secondary roof forms and regular door and window openings. The scale, proportions and regular pattern of openings is continued in the less formal student accommodation building.</i></p>

7.0 Impact assessment

The following section provides a description of the proposal and is followed by a detailed assessment of the potential impacts to identified heritage significance.

7.1 Construction impact assessment

7.1.1 Direct impacts

Direct impacts are those that cause a direct adverse impact to a heritage item, such as that caused by machinery or vehicles that damage the fabric of a heritage item or one of its features, elements or setting. These types of impacts affect all types of heritage, including built, landscape and archaeological items. In relation to this proposal, this type of impact may occur during general construction of the road upgrade or as part of the early works, such as during establishment of construction ancillary facilities or other ancillary works necessary for construction.

7.1.2 Indirect impacts

Indirect impacts are those that cause an indirect adverse impact to a heritage item, such as vibration, settlement, visual impact or a change of use, association or access to a heritage item during construction. These types of impacts generally affect built and landscape heritage items.

7.1.3 Assessment of construction impacts

As noted in Section 5.2, there are two heritage items located within the construction footprint; Luddenham Road Alignment and McGarvie Smith Farm (refer Figure 5-1). No heritage conservation areas have been identified within the study area.

Luddenham Road Alignment

This item is expected to be directly impacted by the proposal during the construction phase. The proposal would widen the existing Luddenham Road alignment to about 60 metres, for a length of about 100 metres north of the intersection with Elizabeth Drive, before tapering into the existing alignment. However, as stated in Section 5.4.2, the principal heritage values attached to the Luddenham Road Alignment relate to the historic context and the aesthetic appeal of the alignment with long stretches of post and rail fencing. As the proposed reconfiguration of the intersection of Luddenham Road and Elizabeth Drive would not alter the alignment itself, and the item would continue to fulfil its historical purpose as an essential link between St Marys and Luddenham.

Some archaeological value may be attached to any original road surfaces, which would be impacted by the proposal. However, the potential for these to still remain is low. Any original road surfaces (in the form of stones etc) uncovered during construction should be managed through the *EMF-HE-PR-0076 Unexpected Heritage Items Procedure 2022* (Transport for NSW, 2022).

McGarvie Smith Farm

During the construction of the proposal, construction ancillary facility 3 would be located within part of the heritage curtilage of the McGarvie Smith Farm; however, heritage significant buildings and structures would be located outside of the construction footprint.

The principal heritage values attached to McGarvie Smith Farm relate to its historic use as a veterinary research facility and the historical and aesthetic significance of the 1936 buildings, McGarvie Smith no. 1, 2 and 3. The proposal would not impact the significant buildings located within the curtilage of the item which are located outside the construction footprint (about 115 to 160 metres away from the boundary of the construction footprint) and separated by an access track, including those buildings which relate to its historic use as a veterinary research facility.

The establishment and use of construction ancillary facility 3 may result in temporary indirect (visual) impacts to the landscape character of this item. Although work would take place within the heritage curtilage of the item, there would be no direct impacts to the landscape character, and visual impacts would be limited to the construction phase.

McMaster Field Station

Buildings comprising the McMaster Field Station are located about 350 metres north of the construction footprint, and this item is therefore unlikely to be impacted by the proposal.

Badgerys Creek Post Office

the site of the former Badgerys Creek Post Office is partially within the footprint of the WSA and partially within the construction footprint. While the land parcel is easily identified, the exact location of the former post office within that land parcel is uncertain. However, the disturbances caused by the construction of the airport WSA to the former site is extensive, and any traces of the post office have likely been removed. Should any archaeological deposits be uncovered during construction relating to the Badgerys Creek Post Office or any other site, these would be managed by the *EMF-HE-PR-0076 Unexpected Heritage Item Procedure 2022* (Transport for NSW, 2022) (refer to Section 10.0)

7.1.4 Operational impact assessment

Operational impacts are generally indirect in nature and relate to the ongoing use of the road. Given the type and proximity of non-Aboriginal heritage items in the vicinity of the proposal, there are no operational impacts expected.

A small portion of the widened road corridor would be located within the heritage curtilage of the McGarvie Smith Farm. This would be located along the boundary of the curtilage, over 450 metres away from heritage significant buildings on the site. As such the proposal is not anticipated to have an impact on the significance of McGarvie Smith Farm.

8.0 Cumulative impacts

A cumulative impact assessment has been carried out for both construction and operation, to assess the potential cumulative impacts of the proposal with other projects in the area. This was carried out based on a screening of other nearby projects to determine those that have the potential to cause cumulative impacts. The screening took into account projects that have been approved but where construction has not commenced, projects that have commenced construction, and projects that have recently been completed. The screening process is described further in Section 6.16 of the REF.

The cumulative impact assessment was based on the residual impacts of the proposal (ie those that are expected to exist after application of management and mitigation measures).

A review of relevant projects in the area and their impact on heritage was carried out to determine conclusions regarding cumulative impacts on non-Aboriginal heritage. The following sources were searched to identify relevant projects:

- Department of Planning Environment's major projects portal
- Transport website
- Infrastructure NSW website
- Liverpool City Council website
- Penrith City Council website.

As noted in Section 7.1.4, the proposal would not result in any operational impacts to non-Aboriginal heritage. This extends to the cumulative impact of the proposal. All impacts to non-Aboriginal heritage in combination with other relevant projects in the area are confined to direct and indirect impacts during construction.

8.1 Relevant projects

The construction of the WSA has served as a catalyst for major associated infrastructure works within the vicinity. Related projects include the Elizabeth Drive East Upgrade, which proposes to upgrade Elizabeth Drive from Badgerys Creek Road, Badgerys Creek, to east of Duff Road, Cecil Hills, the M12 Motorway, which would provide a road link between the M7 and The Northern Road, and a connection to the WSA. The Sydney Metro – Western Sydney Airport would provide a rail link between St Marys railway station on the western rail line and the WSA.

Elizabeth Drive East Upgrade

The Elizabeth Drive East Upgrade would include the upgrade of about 7.8 kilometres of Elizabeth Drive between Badgerys Creek Road near the future M12 Motorway and about 600 metres east of Duff Road at Cecil Hills. The Elizabeth Drive East Upgrade is subject to determination of a separate REF by Transport.

A non-Aboriginal heritage assessment was prepared for the Elizabeth Drive East Upgrade proposal (Elizabeth Drive East Upgrade HIA) (AECOM, 2023) located between Badgerys Creek Road, Badgerys Creek, to the east of Duff Road, Cecil Hills. A total of four items of non-Aboriginal heritage were identified within the study area, one listed (Inter-war Spanish Mission House), and three unlisted items (the site of the former Spotted Dog Inn, remains of the former South Creek bridge and McGarvie Smith Farm). Of these, the Elizabeth Drive East upgrade proposal has the potential to have a direct negative impact on the remains of the former South Creek bridge, which is of local heritage significance. This is, however, subject to detailed design and a detailed archaeological recording. If subsequent detailed design identifies that the item cannot be avoided and requires demolition to facilitate the proposal, further assessment may be required.

Western Sydney Airport

The WSA has been approved under the EPBC Act and is currently under construction to the south of the construction footprint.

A non-Aboriginal heritage assessment was prepared for the Environmental Impact Statement for the WSA in 2016, which identified 20 items of non-Aboriginal heritage within the project footprint, and a

further 22 items of non-Aboriginal heritage within its immediate environs (RPS Manidis Roberts Pty Ltd, 2016) (refer section 5.3.2). Of the items of non-Aboriginal heritage within the WSA footprint, 18 were assessed as having Commonwealth heritage significance at a local level. All of these items have been destroyed as part of the construction of the WSA.

Sydney Metro – Western Sydney Airport

Sydney Metro – Western Sydney Airport is an approved State Significant Infrastructure project (SSI-10051) which comprises the construction and operation of a new metro railway around 23 kilometres in length, between the existing Sydney Trains suburban rail network at St Marys in the north and the Western Sydney Aerotropolis Core precinct in the south, via WSA. The project is currently under construction.

A non-Aboriginal heritage assessment in 2020 identified eight off-airport items that would potentially be impacted (Artefact, 2020). Three of these identified items are relevant to this project, being McMaster Field Station, McGarvie Smith Farm and the Luddenham Road Alignment. The heritage assessment determined that the construction of the project would cause a major impact to the McGarvie Smith Farm, a moderate impact on the McMaster Field Station and a minor impact on the Luddenham Road Alignment as discussed in section 5.3.2.

M12 Motorway

The M12 Motorway is an approved State Significant Infrastructure project (SSI-9364) which is currently under construction and will include comprise a new dual-carriageway motorway to connect the M7 Motorway with the WSA and The Northern Road.

An assessment of non-Aboriginal heritage carried out by Jacobs in 2019 found that major impacts were anticipated to four of the nine sites identified, and a minor impact to one site. The assessment determined there would be major impacts to McMaster Field Station and McGarvie Smith Farm as a result of construction of the M12 Motorway. This has been further discussed in section 5.3.2.

Mamre Road Upgrade

The Mamre Road Upgrade (Stage 1) involves the upgrade about 3.8 kilometres of Mamre Road between the M4 Motorway, St Clair and Erskine Park Road, Erskine Park to a four-lane divided road. An assessment of the impact to non-Aboriginal heritage values within the Mamre Road upgrade project footprint was carried out by Aurecon on behalf of Transport in 2021. It found that there would be some direct impact to the Luddenham Road Alignment at its intersection with Mamre Road, but that it would not impact its primary significance, being its alignment. The assessment also stated that potentially significant archaeological remains of former road surfaces may be uncovered that should be managed by unexpected finds protocols but assessed the potential for such archaeological remains as low.

8.2 Cumulative impact assessment

There are two items of non-Aboriginal heritage still surviving within the construction footprint, being:

- The Luddenham Road alignment
- McGarvie Smith Farm.

None of the projects outlined in section 8.1 propose major impacts on the Luddenham Road Alignment. This includes cumulative ongoing visual impacts, with the upgrade of Elizabeth Drive, an existing road, assessed as having no additional impact.

Collectively, the construction associated with the WSA, Sydney Metro – Western Sydney Airport and M12 Motorway projects would have major impacts on the McGarvie Smith Farm. However, although major impacts are expected to McGarvie Smith Farm by construction of both the M12 Motorway and the Sydney Metro – Western Sydney Airport, it should be noted that this proposal does not propose any direct impacts to McGarvie Smith Farm. The proposal would make a negligible contribution to this cumulative impact, as direct impacts are not anticipated. There would be some temporary visual impacts to the landscape character of the McGarvie Smith Farm through its partial use as a construction compound and laydown area, which would contribute to the existing visual impacts from construction of the WSA. However, these visual impacts would be temporary and last only for the duration of construction.

The overall cumulative impact on non-Aboriginal heritage by this proposal is considered negligible.

9.0 Statement of heritage impact

9.1 Introduction

The objective of a Statement of Heritage Impact (SoHI) is to evaluate and explain how the proposed development, rehabilitation or land use change would affect the heritage value of the site and/or place. A SoHI should also address how the heritage value of the site/place can be conserved or maintained, or preferably enhanced by the Proposal.

This impact assessment has been prepared in accordance with the NSW Heritage Office & Department of Urban Affairs and Planning *NSW Heritage Manual* (1996) and NSW Heritage Office *Statements of Heritage Impact* (NSW Heritage Office & Department of Urban Affairs & Planning, 2002). The guidelines pose a series of questions as prompts to aid in the consideration of impacts based on the type of Proposal.

Questions considered are outlined in Table 9-1 below:

Table 9-1: Consideration of proposal impacts

NSW Heritage Manual and Statements of Heritage Impact questions	Proposal response
<i>How is the impact of the addition on the heritage significance to be minimised?</i>	There are no construction or operation impacts identified to non-Aboriginal heritage.
<i>Can the additional area be located within an existing structure? If not, why not?</i>	The existing road corridor is insufficient to contain the upgrade of Elizabeth Drive.
<i>Will the additions tend to visually dominate the heritage item?</i>	The proposed upgrade of Elizabeth Drive is not expected to cause an adverse visual impact to any known item of non-Aboriginal heritage.
<i>Are the additions sited on any known, or potentially significant archaeological deposits? If so, have alternative positions for the additions been considered?</i>	No. However, given that the area has a long non-Aboriginal settlement history, archaeological deposits are possible. These should be managed by reference to the Transport's <i>EMF-HE-PR-076 Unexpected Heritage Items Procedure 2022</i> during construction.

9.2 Summary of Statement of heritage impact

The potential impact to non-Aboriginal heritage has been assessed against the criteria outlined in the NSW Heritage Division guidelines (NSW Heritage Office & Department of Urban Affairs & Planning, 2002). The impacts of the proposal have been graded against the significance of the site as outlined in Table 9-2.

Table 9-2: Summary of the nature of the direct and indirect impacts

Impact Type	Impact
Major negative impacts (substantially affects fabric or values of state significance)	Nil
Moderate negative impacts (irreversible loss of fabric or values of local significance; minor impacts on State significance)	Nil

Impact Type	Impact
Minor negative impacts (reversible loss of local significance fabric or where mitigation retrieves some value of significance; loss of fabric not of significance but which supports or buffers local significance values)	Nil
Negligible or no impacts (does not affect heritage values either negatively or positively)	The proposal would have neither a positive or negative impact on the heritage values of the Luddenham Road Alignment and the McGarvie Smith Farm. As an upgrade of an existing road, the proposal would cause a temporary impact on the McGarvie Smith Farm landscape during construction but would not be ongoing during operation. The proposal would not cause any impact to the significant buildings located within the curtilage of the item.
Minor positive impacts (enhances access to, understanding or conservation of fabric or values of local significance)	Nil
Major positive impacts (enhances access to, understanding or conservation of fabric or values of state significance)	Nil

10.0 Management measures

This section describes management measures to safeguard non-Aboriginal heritage from potential impacts of the proposal. The recommended management measures are described in Table 10-1.

Table 10-1: Management measures

Reference	Management measures	Responsibility	Timing
Non-Aboriginal heritage – Management plan	A Non-Aboriginal Heritage Management Plan (NAHMP) will be prepared and implemented as part of the CEMP. It will provide specific guidance on measures and controls to be implemented to avoid and mitigate impacts to non-Aboriginal heritage	Contractor	Detailed design / pre-construction
Non-Aboriginal heritage – Unexpected finds	Any unexpected heritage finds identified during construction will be governed by Transport's <i>EMF-HE-PR-0076 Unexpected Heritage Items Procedure 2022</i> (Transport for NSW, 2020). Work will only resume once the requirements of the procedure have been satisfied	Contractor	Construction

11.0 Conclusions and recommendations

This assessment has reviewed the non-Aboriginal heritage values of the construction footprint and the impacts resulting from the proposal. Two items of non-Aboriginal heritage have been identified within the construction footprint, being:

- Luddenham Road Alignment
- McGarvie Smith Farm.

The assessment concluded that the proposal is unlikely to cause any harm to the heritage values for either of these items.

Although unlikely, given that the area has a long non-Aboriginal settlement history, archaeological deposits are possible. It is therefore recommended that:

- If any archaeological deposits are uncovered during construction they should be managed through the *EMF-HE-PR-0076 Unexpected Heritage Items Procedure 2022* (Transport for NSW, 2022), in accordance with the safeguards and management measures in Section 10.0
- All contractors should be advised by way of induction and toolbox talks of the presence of nearby heritage, the potential for archaeological deposits to be present and the provisions and responsibilities required in the *EMF-HE-PR-0076 Unexpected Heritage Items Procedure 2022* (Transport for NSW, 2022), in accordance with safeguard GEN4 in Section 7.2 of the REF.

12.0 References

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