

Chapter 12

Non-Aboriginal heritage

Table of Contents

12	Non-Aboriginal heritage	12-1
12.1	Overview	12-1
12.2	Legislative and policy context	12-1
12.2.1	Off-airport	12-1
12.2.2	On-airport	12-1
12.3	Assessment methodology	12-2
12.3.1	Study area	12-2
12.3.2	Historic review	12-2
12.3.3	Identification of heritage items	12-2
12.3.4	Significance assessment	12-2
12.3.5	Assessment of heritage impact	12-3
12.4	Existing environment	12-4
12.4.1	Off-airport	12-4
12.4.2	On-airport	12-10
12.5	Potential heritage impacts – off-airport	12-10
12.5.1	St Marys study area	12-10
12.5.2	Claremont Meadows study area	12-12
12.5.3	Off-airport construction corridor study area	12-13
12.5.4	Aerotropolis Core study area	12-16
12.5.5	Power supply route study area	12-17
12.5.6	Summary of potential off-airport impacts	12-17
12.6	Potential heritage impacts – on-airport	12-18
12.7	Proposed management and mitigation measures	12-18
12.7.1	Performance outcomes	12-18
12.7.2	Mitigation measures	12-18
12.7.3	Consideration of the interaction between measures	12-21

List of tables

Table 12-1	St Marys study area – impacts on significance of heritage items	12-10
Table 12-2	St Marys study area – potential impacts on significance of potential heritage items	12-11
Table 12-3	Claremont Meadows study area – potential impacts on significance of heritage items	12-12
Table 12-4	Off-airport construction corridor study area – potential impacts on significance of heritage item	12-13
Table 12-5	Off-airport construction corridor study area– potential impacts on significance of potential heritage items	12-15
Table 12-6	Aerotropolis Core study area – potential impacts on significance of heritage items	12-16
Table 12-7	Aerotropolis Core study area – potential impacts on significance of potential heritage items	12-17
Table 12-8	Summary of potential off-airport non-Aboriginal heritage impacts	12-17
Table 12-9	Non-Aboriginal heritage performance outcomes	12-18
Table 12-10	Non-Aboriginal heritage mitigation measures	12-19

List of figures

Figure 12-1	Construction footprint and heritage items in St Marys	12-5
Figure 12-2	Construction footprint and heritage items in Claremont Meadows	12-6
Figure 12-3	Off-airport construction corridor footprint and heritage items	12-8
Figure 12-4	Construction footprint and heritage items at Aerotropolis Core	12-9

12 Non-Aboriginal heritage

This chapter provides a summary of the assessment of potential non-Aboriginal heritage impacts during construction and operation of the project. The full non-Aboriginal heritage assessment is provided in Technical Paper 4 (Non-Aboriginal heritage).

12.1 Overview

Potential non-Aboriginal heritage impacts have been avoided and minimised where possible. For example, St Marys Station has been designed to avoid direct impacts on the elements of exceptional heritage significance such as the Goods Shed and the Platform 3/4 building. In addition to archival recordings and preparation of a conservation management plan, mitigation measures have been identified to minimise direct and indirect impacts on heritage items.

The project would result in a moderate indirect impact to the State heritage listed St Marys Railway Station Group and a major indirect impact to the locally listed McGarvie-Smith Farm, primarily as a result of changes to their visual setting.

Potential temporary impacts due to construction vibration would be limited, with potential negligible to minor impacts identified, including at St Marys Railway Station Group, St Marys Post-War Commercial Building and the Warragamba Supply Scheme. There is also moderate potential for the identification of subsurface archaeological remains related to the first railway station at St Marys, which may be of local heritage significance. Archaeological remains potentially affected by the project would be managed in accordance with an Archaeological Research Design prepared for the project.

Design development for the project would continue to identify opportunities to minimise adverse impacts on heritage buildings, elements, fabric, spaces and vistas that contribute to the overall heritage significance of heritage items.

12.2 Legislative and policy context

12.2.1 Off-airport

The *Heritage Act 1977* (NSW) (Heritage Act) provides protection for items of ‘environmental heritage’ including places, buildings, works, relics, movable objects or precincts considered significant based on historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic values. Items considered to be significant to the State are listed on the State Heritage Register (SHR).

Under the Heritage Act, all government agencies are required to identify, conserve and manage heritage items in their ownership or control. These items are protected under heritage and conservation registers established under Section 170 of the Heritage Act. The environmental heritage schedules of Local Environmental Plans (LEPs) are also statutory listings.

Although an approval under Part 4, or an excavation permit under Section 139 of the Heritage Act is not required for an approved State significant infrastructure project under Section 5.23(1) of the *Environmental Planning and Assessment Act 1979* (NSW), the Heritage Act is relevant in that it guides assessment and defines statutory listed items. In addition, Section 146 (notification of a relic) would still be applicable to approved State significant infrastructure projects should a relic be discovered during the works.

12.2.2 On-airport

The *Airports Act 1996* (Cth) outlines the framework for the regulation and management of activities within airport sites that have the potential to cause environmental harm (including harm to heritage). Specific measures to prevent, control or reduce the environmental impact associated with the Western Sydney International, including impacts on non-Aboriginal heritage values, are managed under the *Western Sydney Airport – Airport Plan* (Department of Infrastructure and Regional Development, 2016a) (Airport Plan). The Airports (Environment Protection) Regulations 1997 (Cth) are also relevant on the airport site and contain a general duty to preserve existing aesthetic, cultural, historical, social and scientific (including archaeological and anthropological) values of the local area (reg 4.04) and a duty to give notice of a cultural discovery (reg 4.05).

The *Western Sydney Airport European and Other Heritage Construction Environmental Management Plan* (Western Sydney Airport, 2019e) has also been prepared for Western Sydney International and provides recommendations and policies for the environmental management during the construction of Stage 1 works, including for heritage and archaeology.

12.3 Assessment methodology

12.3.1 Study area

The study area for the non-Aboriginal heritage assessment was defined as the construction footprint, comprising all the areas of surface level ground disturbance and an additional 100 metre buffer, as well as the surface area above tunnelled sections of the project alignment.

12.3.2 Historic review

Previous heritage studies undertaken for other projects were reviewed to understand their impacts on non-Aboriginal heritage items within the study area including:

- the non-Aboriginal heritage assessment prepared for the *M12 Motorway Environmental Impact Statement* (Transport for NSW, 2019b)
- the non-Aboriginal heritage assessment prepared for the *Western Sydney Airport Environmental Impact Statement* (Department of Infrastructure and Regional Development, 2016b).

Listed and potential heritage items within the Western Sydney International site have been or will be removed and/or managed in accordance with the Western Sydney Airport European and Other Heritage Construction Environmental Management Plan and the Airport Plan. As such, no further consideration of these impacts is required for the project.

12.3.3 Identification of heritage items

The following heritage registers were reviewed to identify heritage items within the study area:

- World Heritage List
- Commonwealth Heritage List
- National Heritage List
- SHR
- Liverpool LEP 2008
- Penrith LEP 2010
- S170 heritage and conservation registers.

Where relevant, conservation management plans and other heritage management documents have been used to provide additional information regarding heritage significance.

A preliminary assessment of other potential heritage items and previously unknown archaeological items that would be directly or indirectly impacted by the project was also undertaken.

12.3.4 Significance assessment

Determining the significance of heritage items or a potential archaeological resource is undertaken by using a system of assessment based on the Australia ICOMOS Burra Charter, 2013 (Burra Charter). The principles of the Burra Charter are relevant to the assessment, conservation and management of sites and relics.

If an item meets one of seven heritage criteria (historical significance, associative significance, aesthetic or technical significance, social significance, research potential, rarity and representativeness), and retains the integrity of its key attributes, it can be considered to have heritage significance. The significance of an item or potential archaeological site can then be assessed as being of local or State significance.

The heritage significance of all identified items that have the potential to be directly or indirectly impacted by the project are identified in Technical Paper 4 (Non-Aboriginal Heritage).

12.3.5 Assessment of heritage impact

Potential heritage impacts for this assessment are identified as:

- direct impacts, resulting in the physical alteration or damage to the item that would alter its heritage significance
- indirect impacts, resulting in impacts on significant view lines, vistas or setting of the item which would alter its heritage significance
- settlement and vibration impacts, resulting from increased vibration and ground settlement
- archaeological impacts, resulting in impacts on potential archaeological remains predicted within the study area.

Potential cumulative impacts on non-Aboriginal heritage within the study area have also been considered and are assessed in Technical Paper 4 (Non-Aboriginal heritage). This cumulative assessment is also summarised in Chapter 24 (Cumulative impacts).

The terminology used to determine the overall magnitude of impact resulting from the project is outlined below:

- major – actions that would have a long-term and substantial impact on the significance of a heritage item
- moderate – actions involving considerable changes to a heritage item which would impact the items' significance
- minor – actions that would result in slight impacts on the significance of a heritage item
- negligible – actions that would result in very minor changes to the significance of heritage items
- nil – actions that would have no change and therefore no impact on the significance of a heritage item
- positive – actions which improve the condition of fabric or local setting which improves the legibility of the significance of the heritage item.

Further definition of these terms is included in Table 7 in Technical Paper 4 (Non-Aboriginal heritage).

Assessment of potential vibration and settlement impacts

Vibration arising from construction or excavation work has the potential to impact on the fabric of heritage items, potentially affecting structural integrity. In locations where heritage items are adjacent to demolition, construction or excavation works, or above tunnel sections of the project alignment, an assessment of potential vibration impacts has been undertaken.

Settlement caused by groundwater drawdown and ground movement from tunnelling and excavation activities also has the potential to affect heritage structures and has been considered in this assessment.

Assessment of potential archaeological impacts

The assessment of historical archaeological potential relates to the study area's potential to contain historical archaeological resources. This assessment is based on consideration of historic land use, current ground conditions, analysis of the historical development of the study area, and considering whether subsequent actions (either natural or human) may have impacted on archaeological evidence for these former land uses. The grading and justification for determining archaeological potential is outlined below:

- nil – no evidence of historical development or use
- low – evidence of little or low intensity historical development
- moderate – evidence of known historical development and some previous impacts

- high – evidence of multiple phases of historical development and structures with minimal or localised later development impacts.

The non-Aboriginal archaeological assessment (Chapter 6 of Technical Paper 4 (Non-Aboriginal heritage)) provides an overview of predicted archaeological remains and their significance, as well as an assessment of potential impacts that would occur from the project. Archaeological Research Designs and archaeological excavation methodologies would be prepared in subsequent technical reports in future stages of design development during the preparation of the Submissions and Amendment Report phase of the project following exhibition of the Environmental Impact Statement.

Further survey and investigation

Only publicly accessible parts of the study area were surveyed. Due to limited access to private properties within the study area, not all known or potential heritage items could be inspected. Further site inspections would be conducted for all properties and potential heritage items which were not accessible during the Submissions and Amendment Report phase of the project following exhibition of the Environmental Impact Statement.

12.4 Existing environment

12.4.1 Off-airport

St Marys study area

The St Marys construction footprint, study area and heritage items are shown in Figure 12-1 and include:

- St Marys Railway Station – listed State significant item (within the construction footprint)
- St Marys Post-War Commercial Building on the west side of Queen Street – potential locally significant item
- St Marys Munitions Workers Housing in the area to the west of Carinya Avenue – potential locally significant item.

The location of items of significant fabric at St Marys Railway Station are shown in Figure 18 in Technical Paper 4 (Non-Aboriginal heritage) and include the St Marys Station Platform 3/4 building, the Goods Shed, jib crane and signal box.

Archaeological resources at the St Marys study area have been identified in the vicinity of the existing St Marys Railway Station. There is moderate potential for the identification of subsurface remains related to the first railway station at St Marys, which may be of local heritage significance.

Claremont Meadows study area

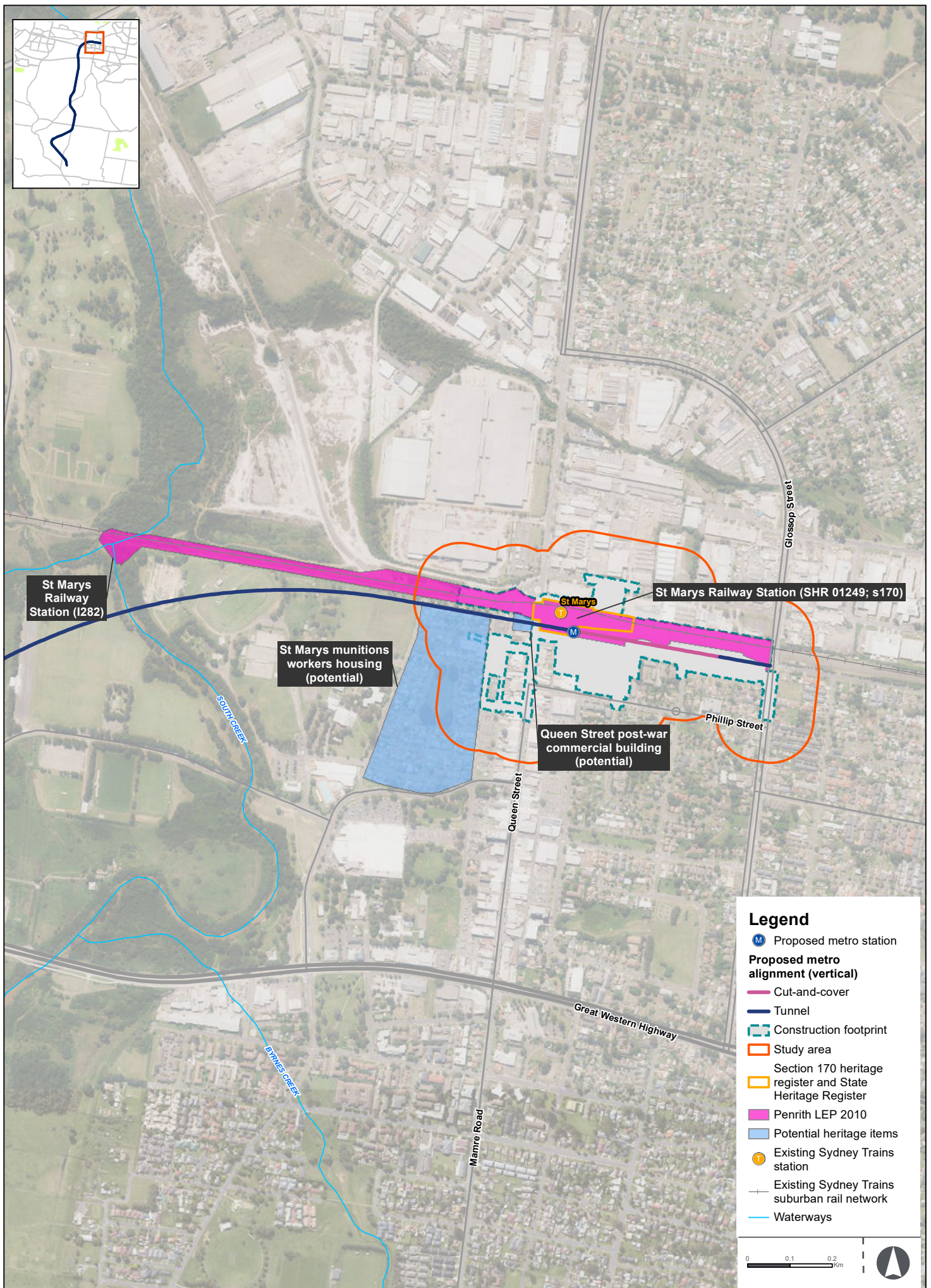
The Claremont Meadows construction footprint, study area and heritage items are shown in Figure 12-2 and include:

- Great Western Highway Milestone located on the southern side of the Great Western Highway – listed locally significant item
- Four Winds Dwelling on the southern side of the Great Western Highway and to the east of Reserve Road – listed locally significant item
- Brick House on the northern side of the Great Western Highway to the east of Werrington Road – listed locally significant item.

No potential heritage items or archaeological resources were identified within the Claremont Meadows construction site study area.

Orchard Hills study area

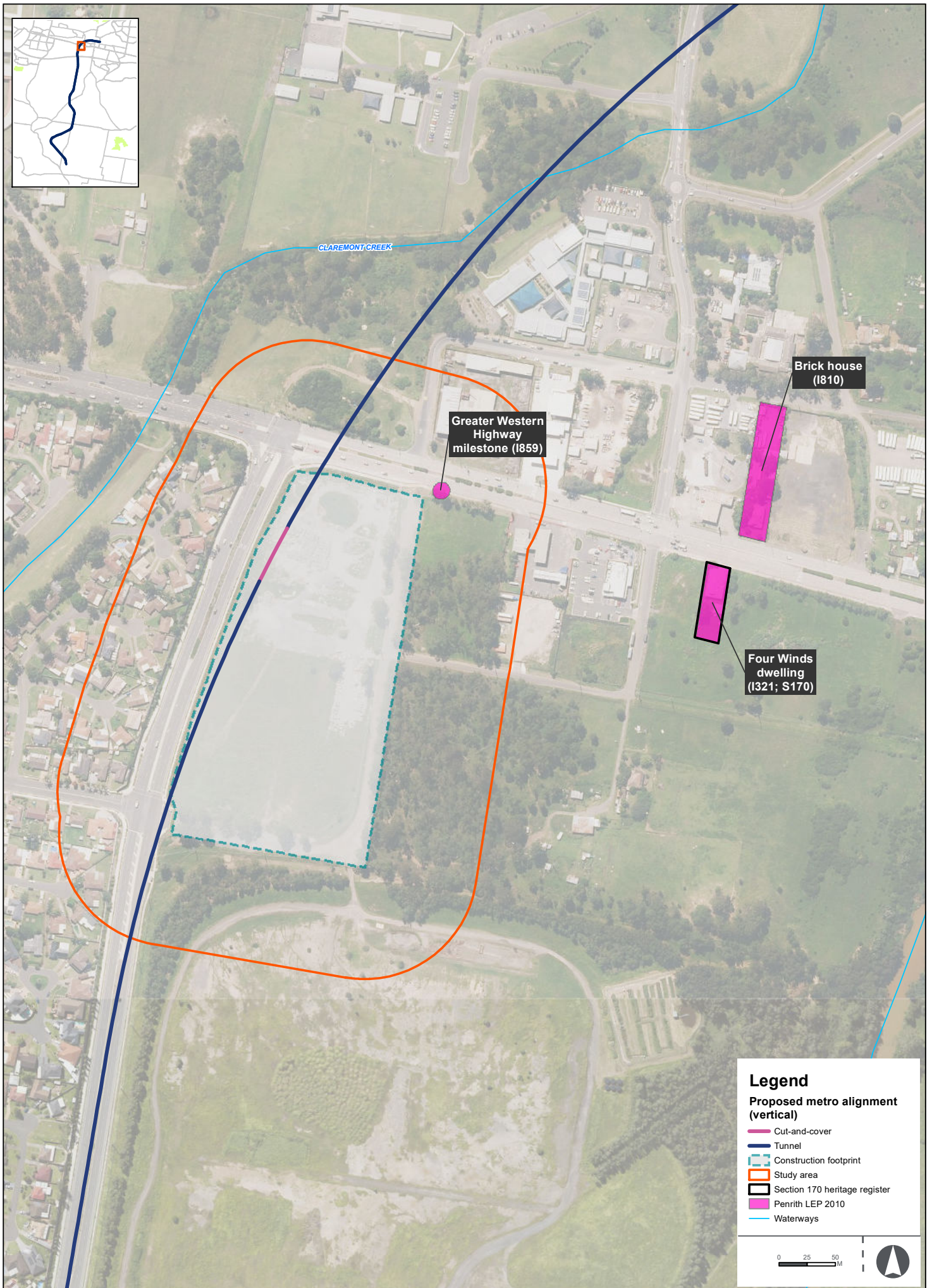
This assessment has not identified any listed or potential heritage items or archaeological resources within the Orchard Hills study area.



Construction footprint and heritage items in St Marys

Figure 12-1

Indicative only, subject to design development



Off-airport construction corridor study area

The off-airport construction footprint, study area and heritage items are shown in Figure 12-3 and include:

- McGarvie-Smith Farm north of Elizabeth Drive and west of Badgerys Creek – listed locally significant item (within the construction footprint)
- Luddenham Road – listed locally significant item (within the construction footprint)
- Warragamba Supply Scheme – listed State significant item (within the construction footprint)
- Kennett's Airfield located to the west of Luddenham Road and directly south of the Warragamba to Prospect Water Supply Pipelines – potential locally significant item (within the construction footprint)
- McMaster Farm north of Elizabeth Drive and east of Cosgroves Creek – potential locally significant item (within the construction footprint).

No archaeological resources were identified within the off-airport study area.

Stabling and maintenance facility study area

No listed or potential heritage items or archaeological resources were identified within the stabling and maintenance facility study area.

Bringelly study area

No listed or potential heritage items or archaeological resources were identified within the Bringelly study area.

Aerotropolis Core study area

The Aerotropolis Core construction footprint, study area and the heritage items are shown in Figure 12-4 and include:

The existing heritage items in this location include:

- Former OTC Site Group – listed locally significant item (within the construction footprint)
- Two Water Tanks on the eastern side of Badgerys Creek Road – listed locally significant item (within the construction footprint)
- Kelvin Park Group (named Kelvin on the SHR) – listed State and locally significant item (within the construction footprint)
- Bringelly RAAF Base in the area to the east of Badgerys Creek Road and north of Thompsons Creek – potential locally significant item (within the construction footprint).

The Kelvin Homestead is listed on the SHR and Liverpool LEP 2008 and has two different corresponding curtilages. The SHR curtilage comprises the main property whereas the LEP curtilage comprises the main property and former driveway connection to Badgerys Creek Road.

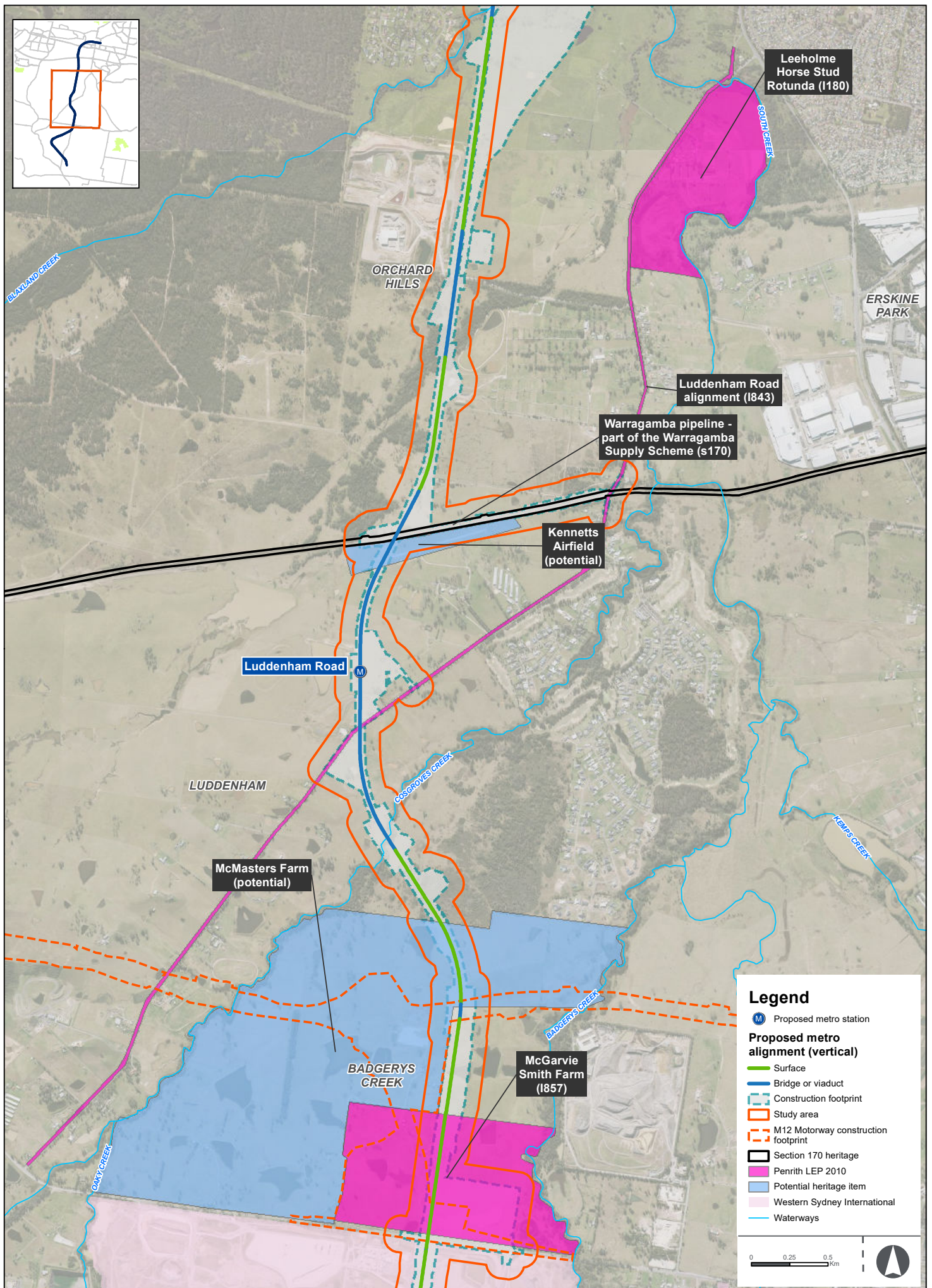
No archaeological resources were identified within the Aerotropolis Core study area.

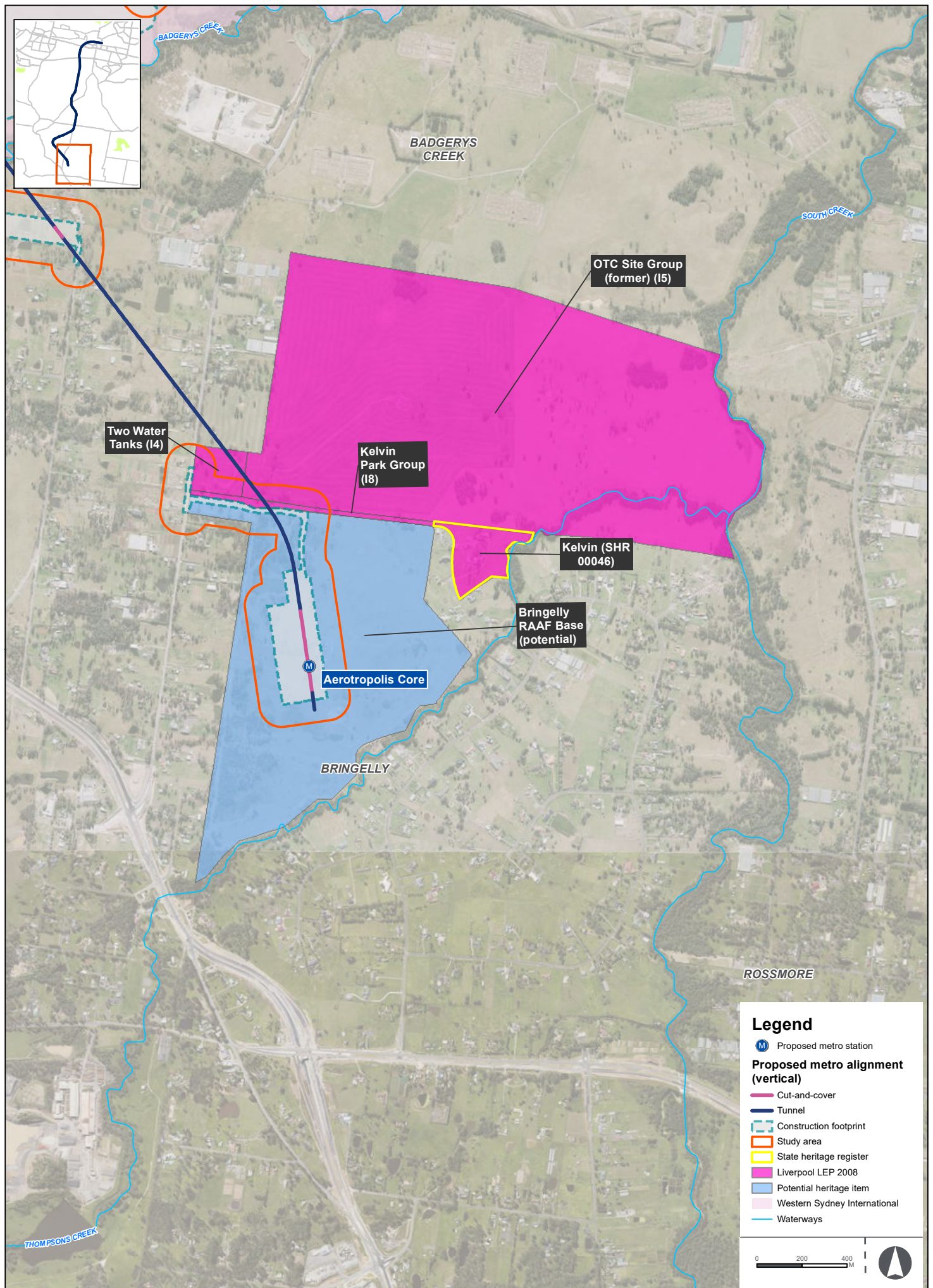
Power supply routes

The project would involve the construction of a permanent power supply between the stabling and maintenance facility at Orchard Hills and an existing substation in the industrial area at Erskine Park. The Luddenham Rotunda (Leeholme Horse Stud Rotunda) is listed on the Penrith LEP 2010 as an item of local heritage significance and is shown on Figure 12-3.

No potential heritage items or archaeological resources were identified within this area.

No listed or potential heritage items or areas of archaeological potential are located within proximity to the Kemps Creek or Claremont Meadows construction power supply routes.





Construction footprint and heritage items at Aerotropolis Core

Figure 12-4

Indicative only, subject to design development

12.4.2 On-airport

The Airport Plan authorises the demolition of all heritage structures on the airport site, including areas within and outside the Western Sydney International Stage 1 Construction Impact Zone. Listed and potential heritage items within the Western Sydney International site have been or would be removed and managed in accordance with the Western Sydney Airport European and Other Heritage CEMP and the Airport Plan.

12.5 Potential heritage impacts – off-airport

12.5.1 St Marys study area

Heritage items and conservation areas

Table 12-1 identifies the listed heritage items within the St Marys study area and discusses the potential impacts of the project on these items. Mitigation measures to manage potential impacts are outlined in Section 12.7.2.

Table 12-1 St Marys study area – impacts on significance of heritage items

Item, listing and significance	Potential impacts	Magnitude
St Marys Railway Station SHR 01249, RailCorp s170 (SHI 4801036), Penrith LEP 2010 1282 (SHI 2260282) State significance	Direct impact – slight alteration of heritage elements The proposed excavation for the cut-and-cover station box would occur within the LEP listing curtilage but would not impact significant fabric associated with the existing St Marys Railway Station. The construction of the aerial concourse, lifts and connections to the existing St Marys Railway Station would occur within the LEP, SHR and s170 curtilage and would result in modifications to Platform 3/4 (moderate significance) and Platform 1/2 (little significance). No direct impact is proposed to the Platform 3/4 building (moderate significance), Goods Shed (exceptional significance), and signal box (high significance). The jib crane would be temporarily relocated during construction and then reinstated in consultation with a heritage advisor.	Minor
	Permanent indirect impact – alteration of heritage setting The aerial concourse is a large structure and would not be sympathetic in material and scale with the Victorian-era architecture and character of the existing St Marys Platform 3/4 building and Goods Shed.	Moderate
	Temporary indirect impact – alteration of heritage setting (construction phase) During construction, elements including a site compound, laydown areas, storage facilities and tunnel boring machine retrieval sites would be visible in the vicinity of the station. An acoustic shed and crane may also be required. These elements, along with the station box excavation and construction of the new aerial concourse, would result in significant alteration to the setting of the station.	Moderate
	Vibration impact Vibration may have the potential to result in cosmetic structural damage to the Goods Shed which would be retained in-situ. Potential vibration impact on other heritage significant structures of the station would be negligible. The jib crane would be temporarily relocated during construction and therefore vibration impacts on this item would not occur.	Minor to negligible

Item, listing and significance	Potential impacts	Magnitude
	Settlement impact Potential settlement impacts on the Goods Shed would be minor while potential settlement impacts on the station platforms and Platform 3/4 building would be negligible.	Minor to negligible
	Overall impact on significance	Moderate

Potential heritage items

Table 12-2 identifies the potential heritage items within the St Marys study area and discusses the potential impacts of the project on these items. Mitigation measures to manage potential impacts are outlined in Section 12.7.2.

Table 12-2 St Marys study area – potential impacts on significance of potential heritage items

Item and significance	Potential impacts	Magnitude
St Marys Post-War Commercial Building Potential local significance	Direct impact – demolition This item is located outside the construction footprint and would not be directly affected.	Nil
	Permanent indirect impact Project works in the vicinity of this item would not alter significant views to the St Marys Post-War Commercial Building.	Negligible
	Temporary indirect impact (construction phase) Elements including a construction site would be visible, although partially obscured, resulting in a minor impact on this item.	Minor
	Vibration impact Potential construction vibration impacts on this item are expected to be negligible.	Negligible
	Settlement impact Potential settlement impacts on this item are expected to be negligible.	Negligible
	Overall impact on significance	Negligible
St Marys Munitions Workers Housing Potential local significance	Direct impact Proposed works in this area are limited to adjacent roads and car park areas and there would be no direct impact on the housing fabric itself.	Nil
	Permanent indirect impact Project works in the vicinity of this item would not alter the visual setting of the former worker's housing area.	Negligible
	Temporary indirect impact (construction phase) Elements including a construction site would be visible. However, these works would not intrude within the boundary nor alter the setting of this item.	Negligible
	Vibration impact Potential construction vibration impacts on this item are expected to be negligible.	Negligible
	Settlement impact Potential settlement impacts on this item are expected to be negligible.	Negligible
	Overall impact on significance	Negligible

Potential archaeological impacts

Proposed construction works at the existing St Marys Railway Station would involve excavation in areas where there is potential for locally significant archaeological remains. This includes potential remains associated with the St Marys Goods Yard, former late 19th and early 20th century commercial, industrial, and residential development, the first St Marys Station and the former Platform 1/2 1888 Station Building.

Overall, the project would result in moderate impacts on locally significant archaeological remains within the St Marys study area. Archaeological remains potentially affected by the project would be managed in accordance with an Archaeological Research Design prepared for the project.

12.5.2 Claremont Meadows study area

Heritage items and conservation areas

Table 12-3 identifies the listed heritage items within the Claremont Meadows study area and discusses the potential impacts of the project on these items.

Table 12-3 Claremont Meadows study area – potential impacts on significance of heritage items

Item, listing and significance	Potential impacts	Magnitude
Great Western Highway Milestone Penrith LEP 2010 1859 Local significance	Direct impact This item is located around 20 m to the east of the proposed services facility and would not be directly affected.	Nil
	Permanent indirect impact During operation, the services facility would not obscure views toward the item, nor would it alter the views between the item and the Great Western Highway.	Nil
	Temporary indirect impact – alteration of heritage setting (construction phase) Construction works near this item would not affect the setting of the item.	Minor
	Vibration impact No potential vibration impacts on this item are anticipated during construction.	Nil
	Settlement impact No potential settlement impacts have been identified in the vicinity of this item.	Nil
	Overall impact on significance	Nil
Four Winds – Dwelling Penrith LEP 2010 I321, DPIE s170 (SHI 3490036) Local significance	Direct impact The construction footprint would not be located within the heritage curtilage of this item.	Nil
	Permanent indirect impact The proposed services facility is around 300 m from this item and would not affect the setting of, or views to, this item.	Nil
	Temporary indirect impact (construction phase) Construction of the proposed services facility would not affect the setting of this item given its distance from the construction site.	Nil
	Vibration impact No potential vibration impacts on this item are anticipated during construction.	Nil
	Settlement impact No potential settlement impacts have been identified in the vicinity of this item.	Nil
	Overall impact on significance	Nil

Item, listing and significance	Potential impacts	Magnitude
Brick house Penrith LEP 2010 1810 Local significance	Direct impact The construction footprint would not be located within the heritage curtilage of this item.	Nil
	Permanent indirect impact The proposed services facility is around 320 m from this item and would not affect the setting of, or views to, this item.	Nil
	Temporary indirect impact (construction phase) Construction of the proposed services facility would not affect the setting of this item given its distance from the construction site.	Nil
	Vibration and settlement impacts No potential vibration and/or settlement impacts on this item are anticipated during construction.	Nil
	Overall impact on significance	Nil

12.5.3 Off-airport construction corridor study area

Heritage items and conservation areas

Table 12-4 identifies the listed heritage items within the off-airport construction corridor study area and discusses the potential impacts of the project on these items. Mitigation measures to manage potential impacts are outlined in Section 12.7.2.

Table 12-4 Off-airport construction corridor study area – potential impacts on significance of heritage item

Item, listing and significance	Potential impacts	Magnitude
Warragamba Supply Scheme WaterNSW s170 (SHI 4580161X) State significance	Direct impact During construction the existing Warragamba to Prospect Water Supply Pipelines corridor would be used for heavy vehicle access to support construction of the rail viaduct structure over the pipelines. The proposed viaduct structure would be elevated above the pipelines and would not be physically connected to the pipelines in any way. Works in the vicinity of the pipelines would be managed in accordance with <i>Guidelines for Development Adjacent to the Upper Canal and Warragamba Pipelines</i> (WaterNSW, 2020).	Negligible
	Permanent indirect impact The project would introduce an elevated concrete viaduct structure over the pipelines which would be visible from the surrounding rural landscape. The viaduct would only be visible within a localised area and minor portion of heritage curtilage.	Minor
	Temporary indirect impact (construction phase) A construction site with vegetation clearance and earthworks to support viaduct construction would be required. Construction site hoarding and fencing would temporarily obstruct views of the pipelines in a small localised area.	Minor
	Vibration impact There is potential for minor vibration impact to this item as the pipelines are located within the minimum safe working distance for the viaduct construction. Works in the vicinity of the pipelines would be managed in accordance with <i>Guidelines for Development Adjacent to the Upper Canal and Warragamba Pipelines</i> (WaterNSW, 2020).	Minor

Item, listing and significance	Potential impacts	Magnitude
	Settlement impact The project alignment is on viaduct at this location and therefore no potential settlement impacts are anticipated.	Nil
	Overall impact on significance	Minor
McGarvie-Smith Farm Penrith LEP 2010 I857 Local significance	Direct impact – partial demolition The project would result in the construction of surface rail track and rail sidings through the heritage curtilage, the demolition of two buildings of moderate significance and outbuildings, and extensive landscape modification.	Moderate
	Permanent indirect impact – alteration of heritage setting The project alignment would result in irreversible changes to the significant rural farming landscape that is directly associated with the history of the McGarvie-Smith Farm. It would change the setting of the item, divide the heritage curtilage and obstruct views throughout the site.	Major
	Vibration impact Potential construction vibration impacts on a concrete silo (high significance) associated with the heritage item have been identified. These potential impacts are considered to be minor.	Minor
	Settlement impact The project alignment would be at surface in this location and therefore no settlement impacts are anticipated.	Nil
	Overall impact on significance	Major
Luddenham Road Alignment Penrith LEP 2010 I843 Local significance	Direct impact Proposed works in this location include two new signalled intersections to provide access to the station and the construction of an elevated viaduct structure over Luddenham Road. There would be no permanent changes to the road alignment and no significant fabric would be removed.	Nil
	Permanent indirect impact – alteration of heritage setting The introduction of an elevated station and viaduct would alter the rural character of the area, which is part of the heritage significance of this item.	Minor
	Temporary indirect impact – alteration of heritage setting (construction phase) Construction works and construction sites would be required to the north west and the south east of Luddenham Road which would temporarily alter the setting of this item.	Minor
	Vibration and settlement impact No potential vibration and/or settlement impacts on the heritage item are anticipated.	Nil
	Overall impact on significance	Minor

Potential heritage items

Table 12-5 identifies the potential heritage items within the off-airport construction corridor study area and discusses the potential impacts of the project on these items. Mitigation measures to manage potential impacts are outlined in Section 12.7.2.

Table 12-5 Off-airport construction corridor study area– potential impacts on significance of potential heritage items

Item and significance	Potential impacts	Magnitude
Kennett's Airfield Potential local significance	Direct impact – partial demolition The project would introduce a large viaduct structure over the western portion of this item and remove the western end of the runway, rendering the airfield inoperable. While aerial photography from 2004 indicates that the airstrip is unserviceable, it has been used as an emergency landing zone as recently as 2018. Existing airfield support structures (hangars), which are considered to be significant fabric, would require removal.	Major
	Overall impact on significance	Major
McMaster Farm Potential local significance	Direct impact – partial demolition A small number of significant elements of this item would be removed for construction of the project, including one remnant dam and two former feeding troughs.	Minor
	Permanent indirect impact – alteration of heritage setting The project alignment would run through part of the heritage curtilage of this property at surface level resulting in irreversible changes to the rural farming landscape which is of heritage significance.	Minor
	Temporary indirect impact – alteration of heritage setting (construction phase) Construction works would include vegetation removal and excavation which would alter the rural landscape associated with the item.	Minor
	Vibration impact The vibration assessment has identified that heavy earthmoving equipment during construction may result in potential for minor vibration impacts on heritage significant structures.	Negligible
	Settlement impact The project would be located at surface level in this location and therefore potential settlement impacts are not anticipated.	Nil
	Overall impact on significance	Moderate

12.5.4 Aerotropolis Core study area

Heritage items and conservation areas

Table 12-6 identifies the listed heritage items within the Aerotropolis Core study area and discusses the potential impacts of the project on these items. Mitigation measures to manage potential impacts are outlined in Section 12.7.2.

Table 12-6 Aerotropolis Core study area – potential impacts on significance of heritage items

Item, listing and significance	Potential impacts	Magnitude
Former OTC Site Group Liverpool LEP 2008 I5, Register of the National Estate (as the Bringelly Receiving Station) Local significance	Direct impact The project alignment would be in tunnel below this item and no direct impacts are anticipated. All significant fabric associated with this item has been previously demolished.	Nil
	Permanent indirect impact Aerotropolis Core Station and the new access road would only be partially visible from this item and would not result in permanent visual impacts on the setting.	Nil
	Temporary indirect impact (construction phase) Construction works for Aerotropolis Core Station and the new access road would not alter the visual setting of this item.	Nil
	Vibration and settlement impact No potential vibration and/or settlement impacts are expected.	Nil
	Overall impact on significance	Nil
Two Water Tanks Liverpool LEP 2008 I4 Local significance	Direct impact The project alignment would be in tunnel below this item and no direct impacts are anticipated.	Nil
	Permanent indirect impact The project alignment would be in tunnel below this item and therefore would not alter its visual setting.	Nil
	Temporary indirect impact (construction phase) Construction activities for tunnelling, Aerotropolis Core Station and the new access road would not alter the visual setting of this item.	Nil
	Settlement and vibration impact No potential vibration and/or settlement impacts are expected.	Nil
	Overall impact on significance	Nil
Kelvin/Kelvin Park Group SHR 00046, Liverpool LEP 2008 I8 State and local significance	Direct impact The project alignment would be in tunnel below the former driveway to Badgerys Creek Road (part of the LEP curtilage). No works would occur within the SHR curtilage.	Nil
	Permanent indirect impact – alteration of heritage setting Aerotropolis Core Station would be visible from this item from a distance of around 650 m away and would not affect views to this item.	Minor
	Temporary indirect impact – alteration of heritage setting (construction phase) Aerotropolis Core Station construction site would be temporarily visible from this item but from some distance away.	Minor
	Vibration and settlement impact No potential vibration and/or settlement impacts are expected.	Nil
	Overall impact on significance	Minor

Potential heritage items

Table 12-7 identifies the potential heritage items within the Aerotropolis Core study area and discusses the potential impacts of the project on these items. Mitigation measures to manage potential impacts are outlined in Section 12.7.2.

Table 12-7 Aerotropolis Core study area – potential impacts on significance of potential heritage items

Item and significance	Potential impacts	Magnitude
Bringelly RAAF Base Potential local significance	Direct impact – partial demolition Construction for Aerotropolis Core Station would require the demolition of several buildings within the former RAAF Base site (the main receiving building and tower, fire hose shed, and dangerous goods store). Only three ancillary buildings of moderate and little significance would remain.	Major
	Overall impact on significance	Major

12.5.5 Power supply route study area

Heritage items and conservation areas

No heritage items are expected to be impacted by the Kemps Creek or Claremont Meadows construction power supply routes.

No direct, indirect, vibration or settlement impacts on the Leeholme Horse Stud Rotunda listed heritage item are anticipated as a result of the proposed permanent power supply route which runs between the stabling and maintenance facility in Orchard Hills and Erskine Park. The curtilage of the heritage item is located around 100 metres from the proposed power route at its closest point.

12.5.6 Summary of potential off-airport impacts

A summary of potential impacts on non-Aboriginal heritage items in the off-airport environment is provided in Table 12-8.

Overall, the project may result in moderate impacts on locally significant archaeological remains at St Marys including potential remains associated with the St Marys Goods Yard, former late nineteenth and early twentieth century commercial, industrial, and residential development, the first St Marys Station and the former Platform 1/2 1888 Station Building.

Table 12-8 Summary of potential off-airport non-Aboriginal heritage impacts

Item	Construction site	Listing	Significance	Impact on significance
St Marys Railway Station	St Marys	SHR 01249, RailCorp s170 (SHI 4801036), Penrith LEP 2010 I282 (SHI 2260282)	State	Moderate
St Marys Post-War Commercial Building	St Marys	Potential	Local	Negligible
St Marys Munitions Workers Housing	St Marys	Potential	Local	Negligible
McGarvie-Smith Farm	Off-airport corridor	Penrith LEP 2010 I857	Local	Major
Warragamba Supply Scheme	Off-airport corridor	WaterNSW s170 (SHI 4580161X)	State	Negligible
Kennett's Airfield	Off-airport corridor	Potential	Local	Major
McMaster Farm	Off-airport corridor	Potential	Local	Moderate

Item	Construction site	Listing	Significance	Impact on significance
Luddenham Road Alignment	Luddenham Road	Penrith LEP 2010 I843	Local	Minor
Kelvin/Kelvin Park Group	Aerotropolis Core	SHR 00046, Liverpool LEP 2008 I8	State	Minor
Bringelly RAAF Base	Aerotropolis Core	Potential	Local	Major

12.6 Potential heritage impacts – on-airport

There are several listed and potential non-Aboriginal heritage items within the on-airport environment. The Western Sydney Airport European and Other Heritage Construction Environmental Management Plan for Western Sydney International contains protocols for the management of these items. The project is not expected to impact these items.

12.7 Proposed management and mitigation measures

The environmental management approach for the project is detailed in Chapter 25 (Environmental management and mitigation). The construction and operational environmental management frameworks are discussed in Sections 25.2 and 25.3 respectively.

Under these broad frameworks, a series of performance outcomes have been developed to define the minimum environmental standards that would be achieved during construction and operation of the project (see Section 12.7.1), and mitigation measures that would be implemented during construction and operation to manage potential identified impacts (see Section 12.7.2).

12.7.1 Performance outcomes

Performance outcomes have been developed consistent with the requirements of the SEARs for the project. Performance outcomes for the project in relation to non-Aboriginal heritage are listed in Table 12-9 and identify measurable, performance-based standards for environmental management.

Table 12-9 Non-Aboriginal heritage performance outcomes

SEARs desired performance outcome	Project performance outcome	Timing
<p>The design, construction and operation of the project facilitates, to the greatest extent possible, the long term protection, conservation and management of the heritage significance of items of environmental heritage</p> <p>The design, construction and operation of the project avoids or minimises impacts, to the greatest extent possible, on the heritage significance of environmental heritage</p>	Impacts on the State heritage significant St Marys Railway Station Group are avoided or minimised so that the overall heritage value of the item is maintained.	Construction
	Impacts on non-Aboriginal heritage items and archaeology are minimised or where possible avoided.	Construction
	The design of St Marys Station is sympathetic to retained and adjacent heritage items.	Operation
	An appropriately qualified and suitably experienced heritage architect and relevant stakeholders are consulted during design development.	Operation
	The design of the project incorporates non-Aboriginal heritage interpretation.	Operation

12.7.2 Mitigation measures

A Construction Environmental Management Framework (CEMF) (Appendix F) describes the approach to environmental management, monitoring and reporting during construction. Specifically, it lists the requirements to be addressed in developing CEMPs, sub-plans, and other supporting documentation for each specific environmental aspect.

The European and Other Heritage CEMP for the on-airport works would be developed in consultation with Western Sydney Airport and would be consistent with the existing Western Sydney Airport European and Other Heritage Construction Environmental Management Plan.

The construction and operation mitigation measures to manage potential non-Aboriginal heritage impacts of the project are listed in Table 12-10.

Table 12-10 Non-Aboriginal heritage mitigation measures

Ref	Mitigation measure	Applicable locations(s)
Construction		
NAH1	Potential moveable heritage items would be identified and assessed and a significant fabric salvage schedule would be prepared by an appropriately qualified and experienced heritage specialist for St Marys Railway Station, Bringelly RAAF Base, McGarvie-Smith Farm, McMasters Farm and Kennett's Airfield. Significant fabric would only be salvaged if it can be salvaged in such a way that it can be reused and is likely to be able to be reused.	St Marys construction site Off-airport construction corridor Aerotropolis Core construction site
NAH2	Heritage advice would be sought to develop solutions to manage potential ground movement impacts to the St Marys Goods Shed.	St Marys construction site
NAH3	Archival recording of heritage items which would be impacted or that would have their setting altered, would be carried out in accordance with the NSW Heritage Office's <i>Photographic Recording of Heritage Items Using Film or Digital Capture</i> (2006). The following items would be archivally recorded: <ul style="list-style-type: none"> • St Marys Railway Station • Kennett's Airfield • Luddenham Road Alignment • McMaster Farm • McGarvie-Smith Farm • Kelvin Park Group • Bringelly RAAF Base. 	St Marys construction site Off-airport construction corridor Luddenham Road construction site Aerotropolis Core construction site
NAH4	Kennett's Airfield will be physically investigated during later investigation phases of the project to confirm heritage significance through an assessment of significance. Appropriate management and mitigation measures would then be determined.	Off-airport construction corridor
NAH5	Archaeological investigation would be conducted for archaeological sites which would be impacted by the project. A non-Aboriginal Archaeological Research Design would be prepared for the project which would outline further archaeological investigation required for the project.	St Marys construction site
NAH6	The following heritage items would be monitored for potential vibration impacts during works: <ul style="list-style-type: none"> • St Marys Railway Station Group • Queen Street Post-War Commercial Building • St Marys Munitions Workers Housing • McGarvie Smith Farm • McMaster Farm. 	St Marys construction site Off-airport construction corridor

Ref	Mitigation measure	Applicable locations(s)
NAH7	The St Marys Station jib crane would be temporarily relocated prior to construction commencing in the vicinity of this item, safely stored and appropriately maintained and reinstated. A detailed methodology for the removal and reinstatement of the jib crane would be prepared in consultation with an appropriately qualified heritage advisor.	St Marys construction site
NAH8	A dilapidation survey of the Warragamba to Prospect Water Supply Pipelines would be undertaken prior to construction commencing in the vicinity of this item.	Off-airport construction corridor
NAH9	If suspected human remains or unexpected items of potential heritage significance are discovered within the on-airport area, all activity would cease and the unexpected/chance finds requirements specified in the Western Sydney Airport European and Other Heritage Construction Environmental Management Plan would be followed.	On-airport
Operation		
NAH10	Design development for the project would endeavour to minimise adverse impacts to heritage buildings, elements, fabric, and heritage significant settings and view lines that contribute to the overall heritage significance of heritage items.	Off-airport
NAH11	<p>The architectural design for the project would take account local heritage context and be sympathetic to local heritage character. This would include using sympathetic building materials, colours and finishes.</p> <p>Design should aim to minimise visual impacts by ensuring that significant elements are not obstructed or overshadowed.</p> <p>Design should adhere to the Sydney Metro – Western Sydney Airport Design Guidelines.</p> <p>The Design Review Panel and Heritage Working Group would be consulted in regard to the design, form and material of new built structures that may impact heritage items.</p>	Off-airport
NAH12	Consultation with the Heritage Council would occur for the design of works that have the potential to impact State significant items including for St Marys Railway Station and Kelvin/Kelvin Park Group	St Marys Station Aerotropolis Core Station
NAH13	A heritage interpretation strategy would be prepared for the project identifying key stories and interpretive opportunities related to non-Aboriginal heritage. The strategy would address historic and contemporary heritage and community values and would identify innovative and engaging opportunities for interpretation.	Off-airport

Ref	Mitigation measure	Applicable locations(s)
NAH14	A conservation management plan would be prepared for St Marys Railway Station, in accordance with NSW Heritage Council guidelines. The plan would address any changes to the station, including updated assessment of significance of elements and recommendations on curtilage changes. It would also provide site specific exemptions and management policies.	St Marys Station
NAH15	Heritage inventory registers for heritage items modified by the project would be updated to document their change in condition following the completion of construction works for the project.	All

12.7.3 Consideration of the interaction between measures

Mitigation measures in other chapters that are relevant to the management of non-Aboriginal heritage impacts include:

- Chapter 10 (Noise and vibration), specifically measures which address the management of potential vibration impacts on heritage structures during construction
- Chapter 13 (Aboriginal heritage), specifically measures relating to heritage interpretation
- Chapter 15 (Groundwater and geology), specifically measures which address the management of ground settlement
- Chapter 20 (Landscape and visual), specifically measures which address the management of potential visual impacts on heritage items during construction and operation.