

# Chapter 16

## Soils and contamination

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## 16 Soils and contamination

**This chapter provides an assessment of the potential impact on soils and contamination as a result of the project, and identifies mitigation measures to address these impacts. In relation to contamination, this chapter draws on information provided in Technical Paper 8 (Contamination).**

### 16.1 Overview

Soil erosion, soil salinity and potential acid sulfate soils would be adequately managed in accordance with proven standard mitigation measures. The potential risks of encountering contamination would also be appropriately managed to avoid impacts on human health and ecological receivers. Areas of high and medium risk of contamination were identified within the construction footprint, including off-airport construction sites at St Marys, Claremont Meadows services facility, Orchard Hills, stabling and maintenance facility, off-airport construction corridor, Luddenham Road, Bringelly services facility, Aerotropolis Core and on-airport construction sites including on-airport construction corridor, Airport Business Park Station, Airport Terminal Station, Western Sydney International tunnel portal and on-airport construction support site.

Any contamination encountered on the airport site that has not been remediated by Western Sydney Airport would be managed in accordance with a project-specific remediation action plan that would be consistent with the existing *Western Sydney Airport Remediation Action Plan* (Department of Infrastructure and Regional Development, 2019) to the extent practicable. Other mitigation measures would include an unexpected finds protocol and measures for the prevention of contamination, including spill prevention and spoil and stockpile management.

### 16.2 Legislative and policy context

The relevant legislation, policies and assessment guidelines considered in the preparation of the soils and contamination impact assessment are listed for on-airport and off-airport in Section 16.2.1 and Section 16.2.2 respectively.

#### 16.2.1 Off-airport

A list of the relevant off-airport legislation, assessment guidelines, standard and policies is provided below:

- National Environment Protection (Assessment of Contamination) Measure 1999 as amended in 2013 (ASC NEPM)
- *Contaminated Land Management Act 1997* (NSW)
- *Protection of the Environment Operations Act 1997* (NSW)
- Protection of the Environment Operations (Waste) Regulation 2014
- *State Environmental Planning Policy No. 55 – Remediation of Land* (SEPP 55)
- *PFAS National Environmental Management Plan 2.0* (HEPA, 2020)
- *Acid Sulfate Soils Assessment Guidelines* (Department of Planning, 2008)
- *Acid Sulfate Soils Manual* (Acid Sulfate Soils Management Advisory Committee, 1998)
- *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (under the National Water Quality Management Strategy) (ANZAST, 2018)
- *Managing Land Contamination: Planning Guidelines SEPP 55 – Remediation of Land* (DUAP & EPA, 1998)
- Landslide risk management guidelines presented in the '*Guideline for Landslide Susceptibility, Hazard and Risk Zoning for Land Use Planning*' (Australian Geomechanics Society, 2007)
- *Soil and Landscape Issues in Environmental Impact Assessment* (DLWC, 2000)

- *Managing Urban Stormwater: Soils and Construction, Volume 1* (Landcom, 2004)
- *Managing Urban Stormwater: Soils and Construction, Volume 2* (Department of Environment and Climate Change, 2008).

### 16.2.2 On-airport

A list of the relevant on-airport legislation, assessment guidelines, standard and policies is provided below:

- *Airports Act 1996* (Cth) and the *Western Sydney Airport – Airport Plan* (Department of Infrastructure and Regional Development, 2016a) (Airport Plan)
- Airports (Environment Protection) Regulations 1997
- National Environment Protection (Assessment of Contamination) Measure 1999 as amended in 2013 (ASC NEPM)
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (under the National Water Quality Management Strategy)
- relevant Commonwealth environmental management guidance on perfluorooctanoic acid and perfluorooctane sulfonic acid (HEPA, 2020).

## 16.3 Assessment approach

The study area for soils and contamination comprises the project alignment plus a one kilometre buffer either side of the alignment. The assessment of existing potential contamination relating to surface construction has been described by construction sites that make up the construction footprint.

### 16.3.1 Off-airport

Following the ASC NEPM approach, a desktop review was undertaken to understand the local environment, identify sensitive receptors and identify potential areas of existing contamination within the construction footprint. This included reviewing the following in relation to the study area:

- published geology, soils and acid sulfate soil risk maps
- current land use, reviewed using current aerial photography, current maps, businesses and Local Environmental Plan (LEP) zones
- registered groundwater wells, groundwater dependant ecosystems and existing hydrogeology reports
- NSW Environment Protection Authority (EPA) databases of:
  - contaminated land record of notices issued under the CLM Act by the NSW EPA
  - sites notified as contaminated to the NSW EPA under the CLM Act
  - NSW EPA per- and polyfluoroalkyl substances (PFAS) investigation program sites
  - former gasworks sites
  - licensed premises, delicensed premises still regulated by the NSW EPA, licences surrendered, and clean up and penalty notices issued by the NSW EPA
- National Pollution Inventory (NPI) industrial facilities
- public register of properties affected by loose-fill asbestos insulation
- current and former Defence sites and Department of Defence unexploded ordnance (UXO) maps
- historical aerial photographs from 1947, 1955, 1970, 1980, 1994, 2005 and 2019
- historical commercial and directory trade data from 1932, 1940, 1950, 1965, 1970, 1974, 1980, 1990 and 1991 for selected parts of the study area

- publicly available contamination investigation, assessment and remediation reports for the study area.

In addition, a site inspection was undertaken to identify any additional potential contamination sources and verify those potential areas of environmental concern identified in the review. Through the desktop and site assessment, potential areas of environmental concern were identified, and a conceptual site model prepared to understand the potential human health and environmental risk.

### Conceptual site model

The conceptual site model considers the different exposure pathways between a contamination source and receptor in the present and/or future. This approach provides a conservative assessment of exposures and enables a consistent approach on appropriate mitigation measures to be adopted.

The conceptual site model utilises a risk ranking matrix, which considers the likelihood and potential consequence of contamination (i.e. the potential for human health and/or ecological exposure based on the type of potential contamination source and the extent and type of construction works). The risk ranking matrix is detailed in Section 3.3 of Technical Paper 8 (Contamination). The risk rankings provided in Section 16.5 were used to inform the type of mitigation measure to manage potential contamination risk.

Technical Paper 8 (Contamination) provides information on the approach for the management of spoil (including contaminated spoil) during construction of the project.

#### 16.3.2 On-airport

The methodology for the on-airport environment comprised the review of the following plans and reports prepared for the Western Sydney International Stage 1 Construction Impact Zone:

- *Western Sydney Airport Soil and Water Construction Environmental Management Plan* (Western Sydney Airport, 2019g)
- *Western Sydney Airport Environmental Impact Statement* (Department of Infrastructure and Regional Development, 2016b)
- Western Sydney Airport Remediation Action Plan.

The *Western Sydney Airport Environmental Impact Statement* (Department of Infrastructure and Regional Development, 2016b) and Western Sydney Airport Remediation Action Plan reports and plans were informed by, and included a summary of information from, the following reports:

- *Preliminary (Phase 1) Contaminated Assessment Report, Proposed Western Sydney Airport, February 2016* (Department of Infrastructure and Regional Development, 2016c)
- *Detailed Site Contaminated Investigation, Proposed Western Sydney Airport, February 2016* (Department of Infrastructure and Regional Development, 2016d).

The on-airport project construction footprint and tunnel alignment is located both within and outside the Western Sydney International Stage 1 Construction Impact Zone. Additional contamination, geotechnical and hydrogeological investigations undertaken for the project within the Western Sydney International were also reviewed. Areas of potential contamination risk identified in the review of previous reports were assessed for potential human or ecological health risks in the context of the project. The preliminary conceptual site model was then developed for the on-airport project area.

The Western Sydney Airport Remediation Action Plan describes the remediation strategy to be adopted during the development of the Western Sydney International. It is anticipated that remediation of the Western Sydney International Stage 1 Construction Impact Zone would be complete prior to construction of the project.

However, given that the project would involve construction activities and construction depths that may vary from those associated with Western Sydney International, Sydney Metro would also develop a project-specific Remediation Action Plan (Sydney Metro Remediation Action Plan). The Sydney Metro Remediation Action Plan would be prepared in a manner consistent with the Western Sydney Airport Remediation Action Plan to the extent practicable, and would be applied to any contamination encountered by Sydney Metro that has not been remediated by Western Sydney Airport.

Following the review of these plans and reports, the on-airport soils and contamination assessment involved the assessment of potential construction and operation impacts of the project and the identification of mitigation measures.

## 16.4 Existing environment

### 16.4.1 Off-airport

#### Soil landscapes

Soils within the off-airport environment consist primarily of the Blacktown and South Creek soil landscapes. The Blacktown soil landscape consists of shallow to moderately deep (greater than one metre) sandy soils typical of eucalypt forests. The soils are characterised by seasonal waterlogging, moderately reactive subsoils and localised surface movement potential.

The South Creek soil landscape comprises the present active floodplain of many drainage networks of the Cumberland Plain and consists of deep layered sediments over bedrock including clays and loams. The soils are characterised by seasonal waterlogging, localised permanently high-water tables, localised water erosion hazard and localised surface movement potential.

#### Salinity

Salinity is caused by the accumulation of salts within soil, surface water and groundwater from natural conditions that has been accelerated in areas by anthropogenic activities. In Western Sydney, salinity issues are mostly associated with dryland salinity. The *Salinity Potential in Western Sydney Map* (Department of Infrastructure, Planning and Natural Resources, 2002) shows areas of known salinity, and high and moderate salinity potential in parts of the off-airport study area. The known areas within the off-airport environment are:

- the riparian zone and unnamed creek just south of Patons Lane
- Badgerys Creek at Bringelly.

There is also high salinity potential for the areas around all watercourses (Department of Infrastructure, Planning and Natural Resources, 2002). The remainder of the study area is mapped as having moderate salinity potential. The salinity risk is shown on Figure 16-1.

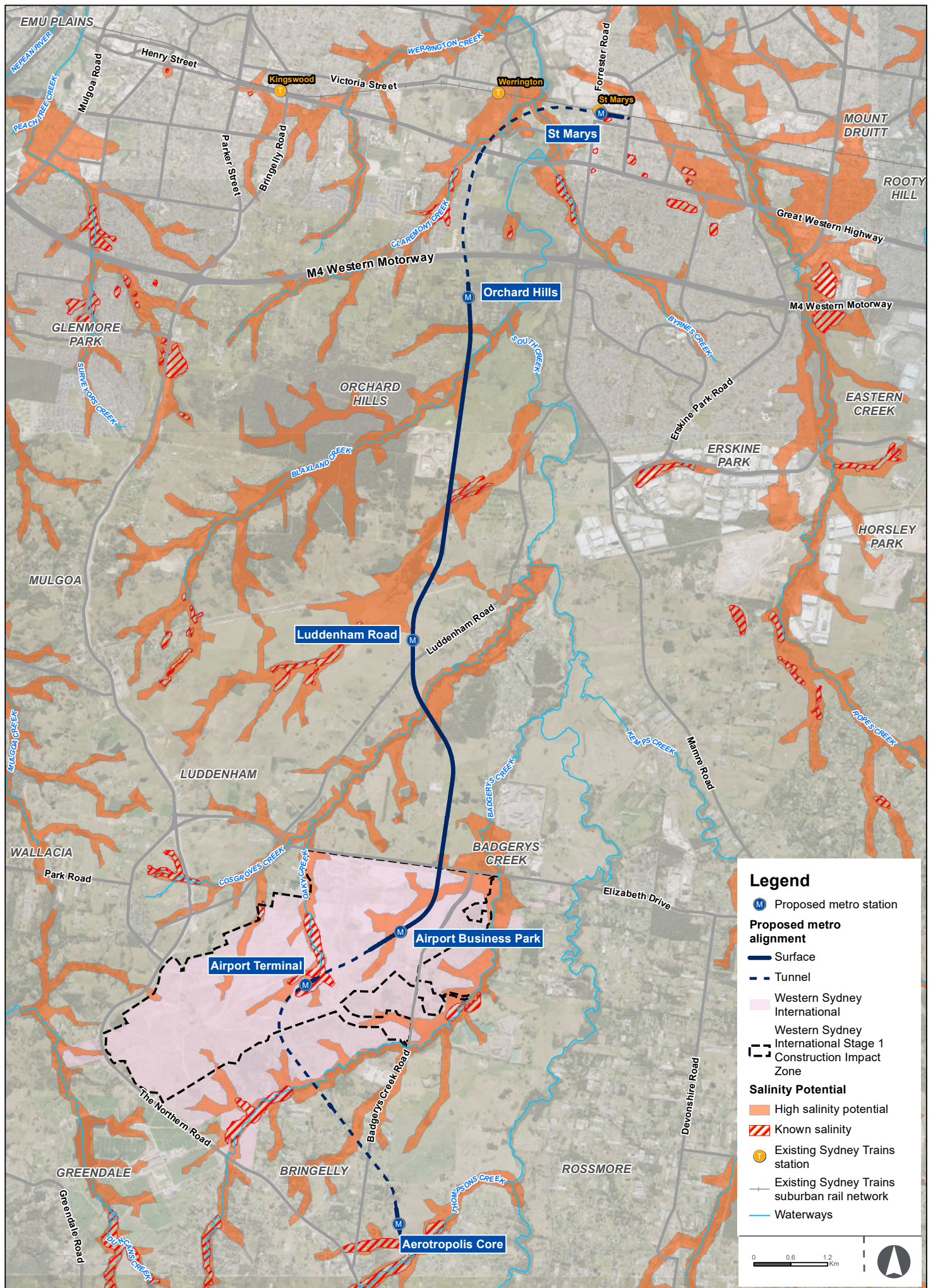
Chapter 15 (Groundwater and geology) provides details on existing salinity conditions of groundwater. Based on historic groundwater sampling and existing literature, the groundwater along the project alignment is considered saline and exceeds the salinity criteria for lowland rivers.

#### Acid sulfate soils

Acid sulfate soils (ASS) is the common name given to a range of soil types that react when exposed to air to form sulfuric acid, which can damage built structures and harm animals and plants.

The off-airport environment is considered to have a low probability of ASS. The likelihood of ASS from coastal processes is low given elevation is >10 metres AHD and the project is not within a coastal area. Inland ASS can form within saline waterlogged soils with high quantities of organic matter. These may occur in large dams, drainage channels, riparian zones and wetlands within the study area. The areas mapped as high potential or known salinity risk on Figure 16-1 have the potential to form ASS.





High salinity potential and known salinity risk areas

Figure 16-1

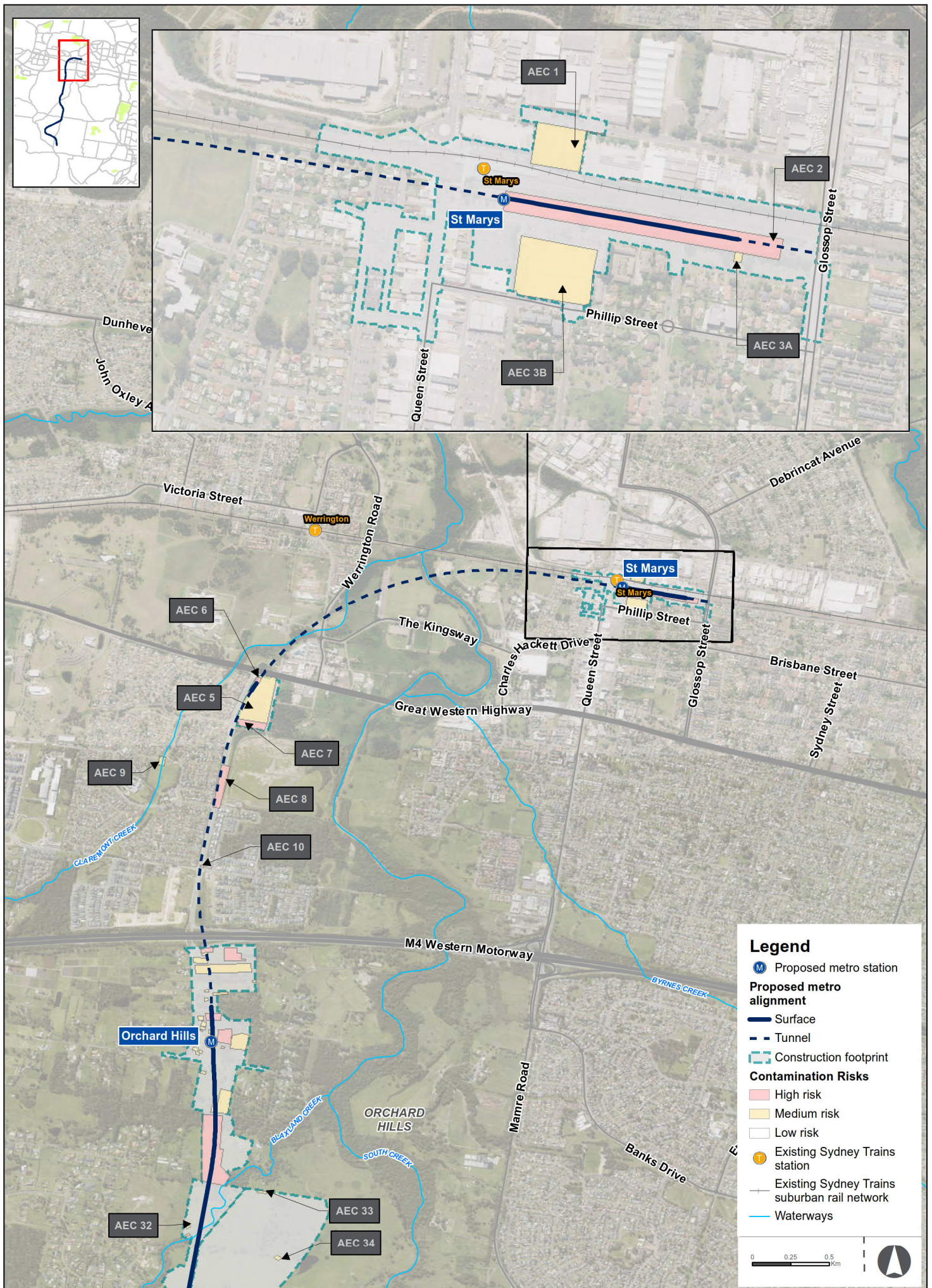
## Contamination

The main sources of potential contamination within the off-airport study area include:

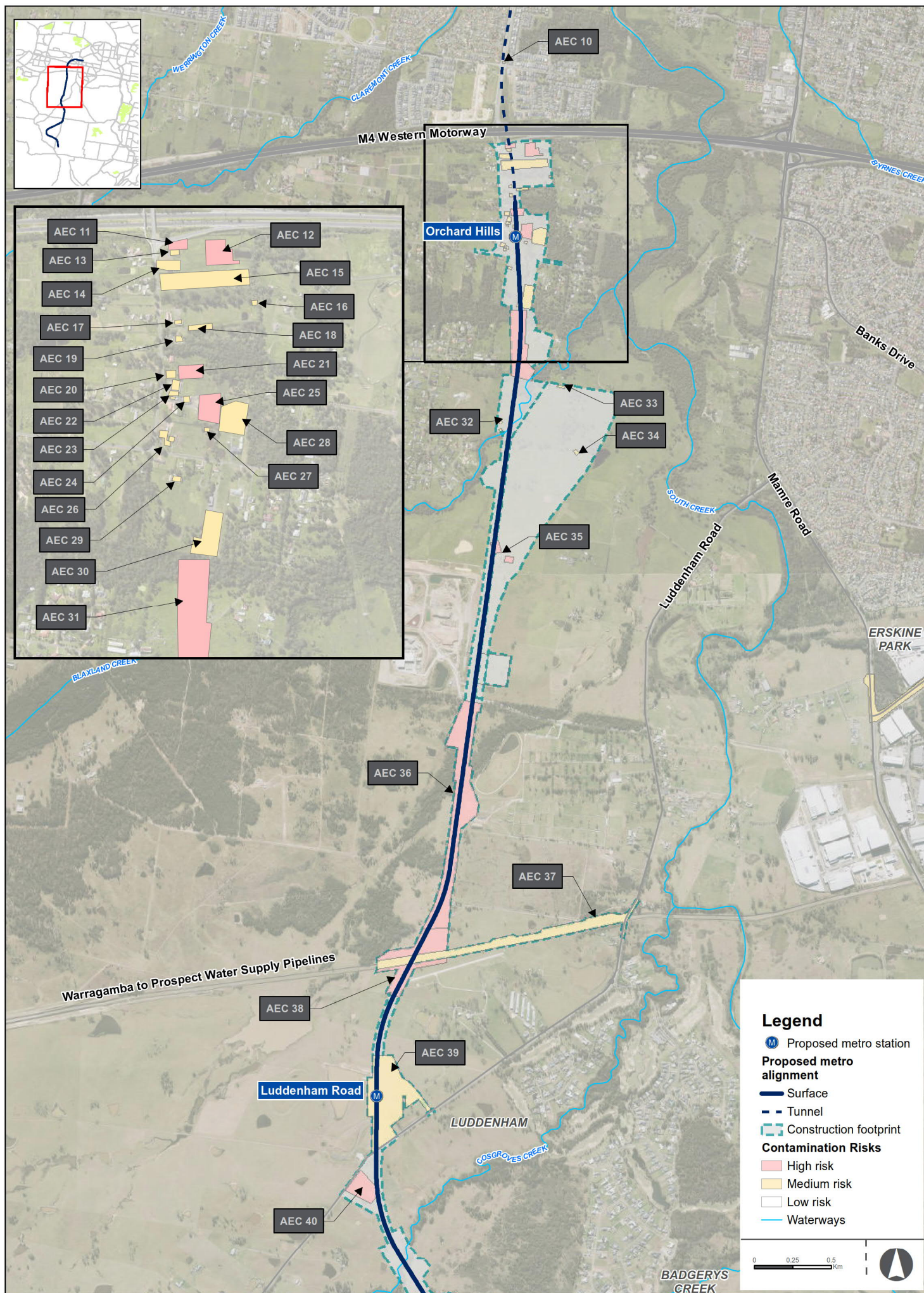
- past industrial land uses including a former wrecking yard, former bus depot with potential former underground storage tanks and former plastic manufacturing businesses along Harris Street in St Marys within the construction footprint
- potential former fuel storage in the Sydney Trains Incident Emergency Response Depot at 1 Station Street within the St Marys construction site
- former rail siding within the bus interchange area in Station Street and rail activities, stockpiling and filling within the T1 Western Line corridor and within the St Marys construction site
- off-site sources in St Marys including former dry cleaners and service stations which are upgradient of the St Marys construction site and the tunnel alignment
- off-site sources comprising service stations and historical industrial businesses on the Great Western Highway at Werrington which are upgradient of the tunnel alignment
- the closed Gipps Street Landfill (former putrescible and industrial landfill) within part of the Claremont Meadows services facility site and tunnel alignment in Claremont Meadows
- unlicensed waste operations including areas of waste dumping and burial on rural properties in Luddenham, Badgerys Creek and Kemps Creek
- areas of oil, fuel and chemical storage, and potential use or storage of PFAS containing aqueous fire-fighting foam on rural properties within the construction footprint and the former Overseas Telecommunications Commission site in the Aerotropolis Core construction footprint, including bulk storage of diesel in underground storage tanks
- potential storage and use of fuel, oil and solvents, and potential use or storage of PFAS containing aqueous fire-fighting foam at Kennett's Airfield in the vicinity of the Warragamba to Prospect Water Supply Pipelines
- past military activities and potential use or storage of PFAS containing aqueous fire-fighting foam within the Defence Establishment Orchard Hills within the off-airport construction corridor at Orchard Hills
- widespread historical use of herbicides and pesticides on rural properties within all construction sites and the surrounding study area
- evidence of hazardous building materials such as asbestos containing materials, lead paint and polychlorinated biphenyls in former and existing buildings, structures and underground conduits within all construction sites.

The areas of environmental concern are shown on Figure 16-2 and discussed further in Section 16.5.







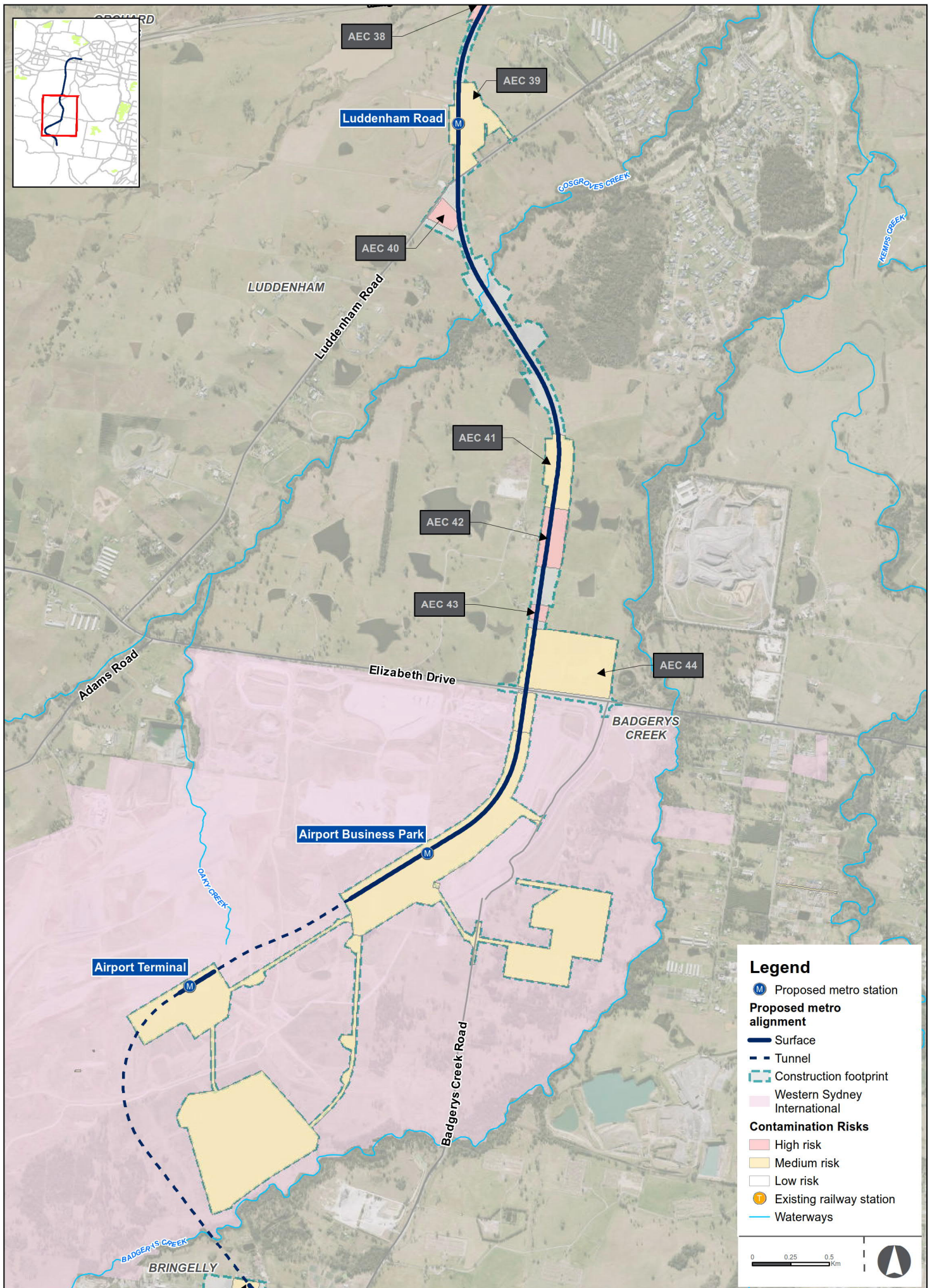


Areas of environmental concern

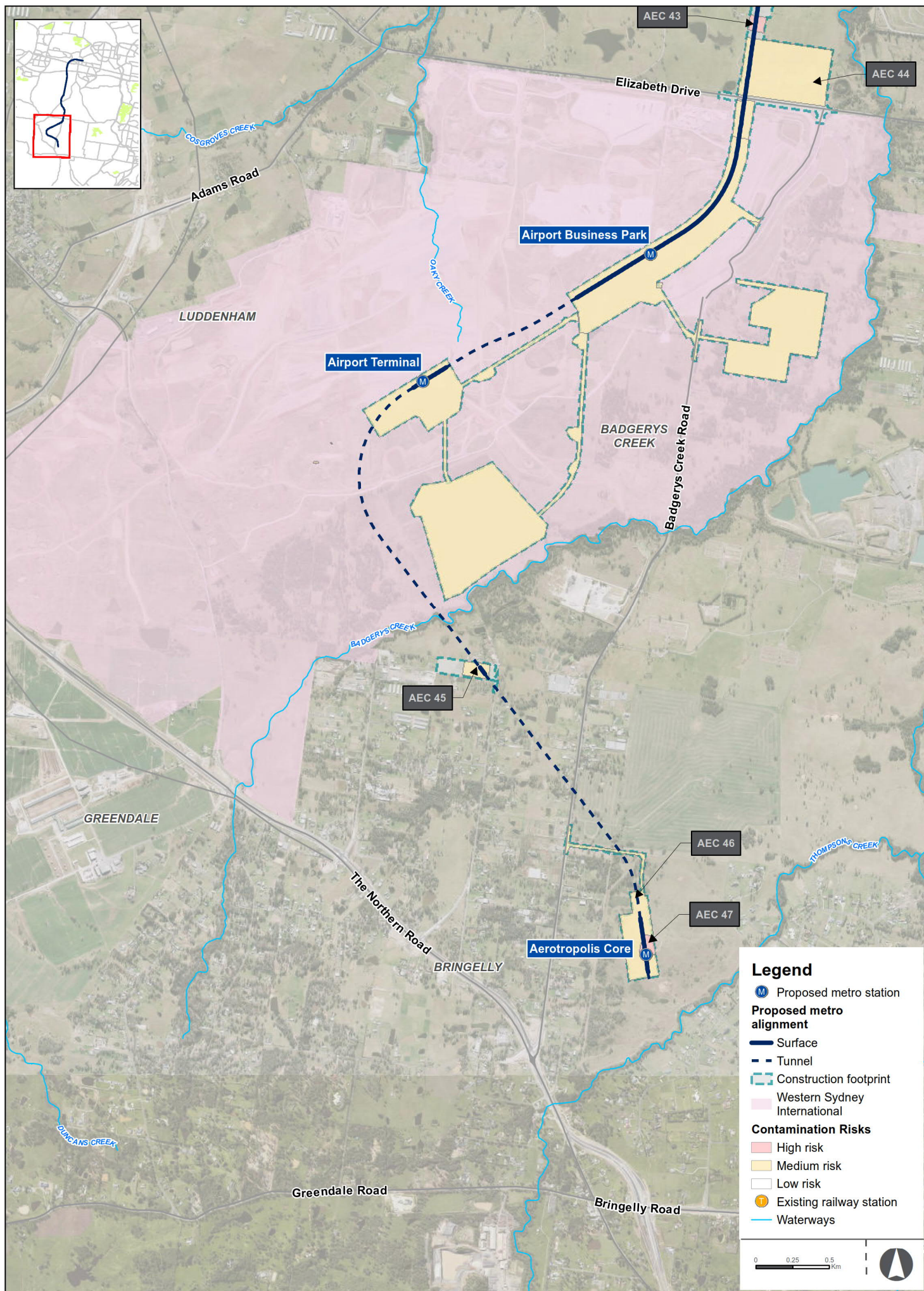
Figure 16-2b

Note: AEC – area of environmental concern  
Indicative only, subject to design development











#### 16.4.2 On-airport

##### Soil landscapes

Soils within the on-airport environment consist primarily of the Blacktown and South Creek soil landscapes. Soils in the on-airport environment are primarily residual clays with areas of alluvial gravels, sands, silts and clays associated with Badgerys Creek. There are no areas of disturbed terrain mapped within the on-airport environment; however, significant earthworks are currently being undertaken within the Western Sydney International Stage 1 Construction Impact Zone which will alter the soil landscapes and ground levels.

##### Salinity

Known areas of salinity within the on-airport environment are shown on Figure 16-1 and include:

- Oaky Creek in the central portion
- Badgerys Creek in the southern portion.

The remainder of the on-airport environment is mapped as having moderate salinity potential.

Groundwater salinity was measured during previous investigations within the on-airport environment and the results were mostly well above the criteria for lowland rivers.

##### Acid sulfate soils

The on-airport environment is located outside coastal areas and is considered to have 'no known occurrence' of ASS materials associated with coastal processes. The on-airport environment may contain potential isolated areas of inland ASS which have not been previously identified. Inland ASS form within saline waterlogged soils with high quantities of organic matter. These may occur in dams, drainage channels, riparian zones and wetlands. The areas mapped as high potential or known salinity risk on Figure 16-1 also have the potential for areas of inland ASS.

The Western Sydney Airport Environmental Impact Statement that field testing undertaken during geotechnical investigations indicated isolated ASS may be present, but not to an extent requiring mitigation measures.

##### Contamination

Early earthworks and remediation within the Western Sydney International Stage 1 Construction Impact Zone commenced in 2018, with major earthworks commencing in March 2020. The project construction footprint is located both within and outside the Western Sydney International Stage 1 Construction Impact Zone. Based on the anticipated construction program for the project, remediation within the Western Sydney International Stage 1 Construction Impact Zone would be completed prior to project construction works commencing. The Stage 1 development of Western Sydney International is being completed under management protocols in the Western Sydney Airport Soil and Water Construction Environmental Management Plan and the Western Sydney Airport Remediation Action Plan.

Preliminary site investigations (Department of Infrastructure and Regional Development, 2016c) identified extensive waste dumping and stockpiling as the main source of potential contamination. The properties that were assessed as having a high potential of contamination based on the desktop assessment were inspected. The specific types and sources of potential contaminants were identified as:

- asbestos from demolished buildings, dumped, buried and stockpiled asbestos containing materials
- fuels and lubricants from farming, landfill, dumped waste and industry
- solvents, acids and fuels from chemical storage
- heavy metals from farming, dumped waste, cemeteries and industry
- ash from landfill, dumped waste and industry
- farm chemicals (pesticides and herbicides) from market gardening, poultry farming and grazing

- pathogens (bacteria and faecal coliforms) from sewage, farming, landfill and cemetery
- inert waste from rural/residential, farming, dumping, industry and landfill.

## **16.5 Potential impacts – construction**

### **16.5.1 Off-airport**

The potential off-airport impacts from contamination, ASS and salinity on sensitive receivers during construction are described in the following sections.

#### **Contamination**

##### *Potentially contaminating construction activities*

Construction works could result in potential soil, surface water or groundwater contamination from the following activities if unmitigated:

- spills of oils, fuels or chemicals from plant and equipment within the construction footprint
- accumulation of potentially contaminated sediments in sedimentation and water quality basins
- importing or backfilling of excavations with spoil which could result in exposure of project workers and surrounding human and ecological receptors to contamination if the spoil happened to be contaminated (i.e. not or incorrectly classified as virgin excavated natural material, excavated natural material or other applicable exemptions)
- stockpiling of potentially contaminated spoil.

##### *Impacts associated with existing contamination*

Excavation or disturbance of existing contaminated soil or interaction with contaminated groundwater could potentially result in:

- exposure of project workers and surrounding human receptors to contamination
- generation of contaminated surface water runoff from contaminated soils which could discharge to waterways or surrounding land
- generation of solid or liquid waste requiring disposal to landfill or a liquid waste facility.

A qualitative risk assessment based on the conceptual site model and risk assessment matrix identified areas of medium and high potential contamination risk within the construction footprint. These are listed in Table 16-1 and shown in Figure 16-2. Mitigation measures relating to medium and high risk sites are discussed in Section 16.7.

All other parts of the construction footprint were assessed as low risk. Given the proposed land use, they are considered to pose a low risk to human health and potential impacts on the environment can be managed by standard erosion and sediment control procedures.

**Table 16-1 Assessment of off-airport potential contamination impacts**

Construction site	Areas of environmental concern (AEC)	Potential contamination sources	Overall risk ranking
St Marys construction site	<ul style="list-style-type: none"> <li>AEC 1: Commuter carpark at 36-38 Harris Street, St Marys North</li> </ul>	<ul style="list-style-type: none"> <li>former fuel, oil and chemical storage and use associated with historical wrecker's yard and associated workshops</li> <li>past use of hazardous building materials (impacts on soil)</li> <li>off-site industrial land use including a former bus depot and plastic manufacturing businesses.</li> </ul>	Medium
	<ul style="list-style-type: none"> <li>AEC 2: 1 Station Street and rail corridor (current bus interchange area), St Marys</li> </ul>	<ul style="list-style-type: none"> <li>potential former fuel storage within Sydney Trains Emergency Response Depot</li> <li>former railway siding activities including historical spills of fuel and oils and stockpiling</li> <li>imported fill</li> <li>off-site upgradient sources of groundwater contamination: former dry cleaners and service station at Phillip Street</li> </ul>	High
	<ul style="list-style-type: none"> <li>AEC 3A: Former unknown council building footprint in Chesham Street, St Marys</li> </ul>	<ul style="list-style-type: none"> <li>potential for hazardous building materials</li> </ul>	Medium
	<ul style="list-style-type: none"> <li>AEC 3B: St Marys Station Plaza</li> </ul>	<ul style="list-style-type: none"> <li>potential chemical storage for back-up generators and air conditioning units and potential use of asbestos containing materials in plaza building. Historical demolition of former buildings containing hazardous building materials</li> </ul>	Medium
Claremont Meadows services facility construction site	<ul style="list-style-type: none"> <li>AEC 5: 1-31 Gipps Street, Claremont Meadows</li> </ul>	<ul style="list-style-type: none"> <li>stockpiling of spoil from road construction and former use as laydown area</li> <li>potential asbestos containing materials in soils</li> </ul>	Medium
	<ul style="list-style-type: none"> <li>AEC 6: 1-31 Gipps Street, Claremont Meadows</li> </ul>	<ul style="list-style-type: none"> <li>off-site source of potential groundwater contamination (closed Gipps Street Landfill and upgradient industrial sources along Great Western Highway)</li> </ul>	High
	<ul style="list-style-type: none"> <li>AEC 7: 1-31 Gipps Street, Claremont Meadows and Gipps Street road reserve</li> </ul>	<ul style="list-style-type: none"> <li>contamination and landfill gases from closed Gipps Street Landfill, a former putrescible, municipal and industrial waste landfill</li> </ul>	High

Construction site	Areas of environmental concern (AEC)	Potential contamination sources	Overall risk ranking
Indicative temporary construction power route corridor in Claremont Meadows	• AEC 8:34-102 Gipps Street, Claremont Meadows	• potential landfill gas migration in subsurface and landfill from closed Gipps Street Landfill	High
	• AEC 9: Myrtle Road Reserve	• potential uncontrolled filling	Medium
	• AEC 10: Gipps Street (south bound) north side of Caddens Road intersection	• past use of hazardous building materials in formerly demolished buildings (impacts on soil)	Medium
St Marys to Orchard Hills tunnel	• St Marys potential groundwater contamination sources to tunnel alignment*	• St Marys industrial area in St Marys north and former dry cleaners at 1-7 Queen Street in St Marys	Medium
	• Werrington potential groundwater contamination sources to tunnel alignment*	• past and current commercial/industrial businesses, service stations, wrecking yard, bus depot and timber yard along the Great Western Highway at Werrington	
	• Claremont Meadows potential groundwater contamination source to tunnel alignment*	• potential landfill gas migration in subsurface and landfill from closed Gipps Street Landfill	
Orchard Hills construction site	• AEC 11 and 12: 52-62 Kent Road, Orchard Hills	• potential workshops and above ground storage tank (52-56 Kent Road) • significant (>100 m <sup>2</sup> ) unlicensed waste disposal to land or storage and historical use of hazardous building materials	High
	• AEC 13 and 14: 52-62 and Kent Road, Orchard Hills	• potential for presence of hazardous building materials	Medium
	• AEC 15: 64 Kent Road, Orchard Hills • AEC 28: 17-25 Lansdowne Road, Orchard Hills	• historical use of herbicides and pesticides on formerly cultivated land and potentially hazardous building materials	Medium
	• AEC 24 and 25: 106-112 Kent Road, Orchard Hills	• potential workshop (AEC 24)	Medium
		• significant (>100 m <sup>2</sup> ) unlicensed waste disposal to land, and historical use of hazardous building materials (AEC 25)	High



Construction site	Areas of environmental concern (AEC)	Potential contamination sources	Overall risk ranking
	<ul style="list-style-type: none"> <li>AEC 16 and 17: 76-80 Kent Road, Orchard Hills</li> <li>AEC 18 and 19: 82-86 Kent Road, Orchard Hills</li> <li>AEC 22 and 23: 100-104 Kent Road, Orchard Hills</li> <li>AEC 26 and 27: 114-122 Kent Road, Orchard Hills</li> <li>AEC 28: 34-38 Lansdowne Road, Orchard Hills</li> <li>AEC 29: 28-32 Lansdowne Road, Orchard Hills</li> <li>AEC 30: 22-26 Lansdowne Road, Orchard Hills</li> </ul>	<ul style="list-style-type: none"> <li>potential workshops, minor waste storage/on-site disposal, use or storage of hazardous building materials located within multiple rural lots</li> </ul>	Medium
	<ul style="list-style-type: none"> <li>AEC 20: 94-98 Kent Road, Orchard Hills</li> </ul>	<ul style="list-style-type: none"> <li>potential cattle or sheep dip, large shed with associated stressed vegetation and potentially hazardous building materials</li> </ul>	High
	<ul style="list-style-type: none"> <li>AEC 21: 94-98 Kent Road, Orchard Hills</li> </ul>	<ul style="list-style-type: none"> <li>potential historical use of hazardous building materials</li> </ul>	Medium
Orchard Hills construction site/off-airport construction corridor	<ul style="list-style-type: none"> <li>AEC 31a: 101 Sweetwater Grove, Orchard Hills</li> </ul>	<ul style="list-style-type: none"> <li>potential widespread dumping and storage of wastes, comprising mainly drums and bulk storage containers, and other wastes including vehicles and unidentifiable items upgradient of the construction footprint</li> <li>some visual evidence of potential dumping within the construction footprint</li> </ul>	High
	<ul style="list-style-type: none"> <li>AEC 31b: 101 Sweetwater Grove</li> </ul>	<ul style="list-style-type: none"> <li>potential workshop</li> <li>potential former use of hazardous building materials.</li> </ul>	Medium
	<ul style="list-style-type: none"> <li>AEC 32 and 33: 2 Bordeaux Place, Orchard Hills</li> <li>AEC 34: 31-39 Luddenham Road, Orchard Hills</li> </ul>	<ul style="list-style-type: none"> <li>potential filled areas, areas of potential hazardous building material use within the construction footprint</li> </ul>	Medium
	<ul style="list-style-type: none"> <li>AEC 35: 43A Luddenham Road, Orchard Hills</li> </ul>	<ul style="list-style-type: none"> <li>potential farm waste burial area within the construction footprint</li> </ul>	High

Construction site	Areas of environmental concern (AEC)	Potential contamination sources	Overall risk ranking
Off-airport construction corridor	<ul style="list-style-type: none"> <li>AEC 36: Defence Establishment Orchard Hills, 114-122 Patons Road Orchard Hills and 1-3 Stockdale Road, Orchard Hills</li> </ul>	<ul style="list-style-type: none"> <li>potential unexploded ordnance (UXO), exploded ordnance (EO) waste, potential areas of buried waste, former hazardous building materials and potential historical use of aqueous fire-fighting foams</li> </ul>	High
	<ul style="list-style-type: none"> <li>AEC 37: Warragamba to Prospect Water Supply Pipelines, Orchard Hills</li> </ul>	<ul style="list-style-type: none"> <li>potential historical use of lead paint and asbestos</li> </ul>	Medium
	<ul style="list-style-type: none"> <li>AEC 38: Kennetts Airfield, 459 Luddenham Road, Luddenham</li> </ul>	<ul style="list-style-type: none"> <li>fuel storage and use (above ground storage tank and underground pipelines), potential storage or historical use of aqueous fire-fighting foams and stockpiles</li> </ul>	High
	<ul style="list-style-type: none"> <li>AEC 39: 565-581 Luddenham Road, Luddenham</li> </ul>	<ul style="list-style-type: none"> <li>potential asbestos containing pipelines, isolated asbestos containing materials in soil from former buildings and isolated zinc exceedance in soil based on previous investigations</li> </ul>	Medium
	<ul style="list-style-type: none"> <li>AEC 40: 546-640 Luddenham Road, Luddenham</li> </ul>	<ul style="list-style-type: none"> <li>potential historical unlicensed stockpiling of waste and soil</li> </ul>	High
	<ul style="list-style-type: none"> <li>AEC 41: 1953-2109 Elizabeth Drive, Badgerys Creek</li> </ul>	<ul style="list-style-type: none"> <li>potential illegal stockpiling of waste and imported soil upgradient of construction footprint</li> <li>potential historical use of imported fill material with potential asbestos containing materials for road construction and filling in parts of the construction footprint</li> </ul>	Medium
	<ul style="list-style-type: none"> <li>AEC 42 and 43: 1793-1951 Elizabeth Drive Badgerys Creek</li> </ul>	<ul style="list-style-type: none"> <li>upgradient and within construction area – potential workshop (fuel/oil/chemical storage and use) and potential spray race/cattle dip (pesticides)</li> </ul>	High
	<ul style="list-style-type: none"> <li>AEC 44: 1793-1951 Elizabeth Drive Badgerys Creek</li> </ul>	<ul style="list-style-type: none"> <li>potential historical presence of imported fill around dams north of Elizabeth Drive</li> </ul>	Medium

Construction site	Areas of environmental concern (AEC)	Potential contamination sources	Overall risk ranking
Bringelly services facility	<ul style="list-style-type: none"> <li>AEC 45: 40 Derwent Road, Bringelly</li> </ul>	<ul style="list-style-type: none"> <li>upgradient off-site source: neighbouring property to the south potentially processing and storing waste without a licence</li> </ul>	Medium
Western Sydney International to Bringelly tunnel	<ul style="list-style-type: none"> <li>Potential groundwater contamination sources in Bringelly</li> </ul>	<ul style="list-style-type: none"> <li>potential fuel and chemical storage on small scale commercial properties</li> <li>potential historical agricultural activities including use of pesticides and herbicides, waste burial and chemical storage</li> <li>potential historical uses of firefighting foam in the Bringelly area such as Bringelly Fire Station</li> </ul>	Medium
Aerotropolis Core construction site	<ul style="list-style-type: none"> <li>AEC 46: 225-245 Bringelly Creek Road, Bringelly</li> </ul>	<ul style="list-style-type: none"> <li>unidentified items in historical aerial imagery and former potential hazardous building materials</li> </ul>	Medium
	<ul style="list-style-type: none"> <li>AEC 47: Former Overseas Telecommunications Commission site, 215 Badgerys Creek Road, Bringelly</li> </ul>	<ul style="list-style-type: none"> <li>former fuel/oil and chemical storage, UST, substation/power station and historical use of hazardous building materials in and around the former Overseas Telecommunications Commission compound</li> <li>potential asbestos containing materials fragments in surface soils</li> <li>potential historical use/storage of aqueous fire-fighting foams, and surface water runoff from off-site</li> </ul>	High
Indicative permanent power supply route corridor in Orchard Hills and Erskine Park	<ul style="list-style-type: none"> <li>AEC 48: Road corridors: Patons Lane, Erskine Park Road and Lenore Lane and John Morphett Place. Demolition of buildings/former farm sheds at the intersection of Lenore Lane and Erskine Park Road</li> </ul>	<ul style="list-style-type: none"> <li>potential use of fill in road construction, roadside waste tipping</li> <li>former demolition of building and structures potentially containing hazardous building materials</li> </ul>	Medium

Construction site	Areas of environmental concern (AEC)	Potential contamination sources	Overall risk ranking
Indicative temporary power supply route corridor in Kemps Creek	<ul style="list-style-type: none"> <li>AEC 49: Cuthel Road and Cross Street</li> </ul>	<ul style="list-style-type: none"> <li>potential illegal waste disposal</li> </ul>	Medium
	<ul style="list-style-type: none"> <li>AEC 50: Easement between 130 and 140 Martin Road</li> </ul>	<ul style="list-style-type: none"> <li>potential imported fill from unknown source containing asbestos and other demolition wastes</li> </ul>	Medium
	<ul style="list-style-type: none"> <li>AEC 51: Easement south of 113 Western Road</li> </ul>	<ul style="list-style-type: none"> <li>potential imported fill/stockpiles from unknown source containing asbestos and other demolition wastes</li> </ul>	Medium
	<ul style="list-style-type: none"> <li>AEC 52: Substation: 120 Cross Street</li> </ul>	<ul style="list-style-type: none"> <li>potential use and storage of oils in substation and hazardous building materials</li> </ul>	Medium
	<ul style="list-style-type: none"> <li>AEC 53: Cuthel Road and Cross Street</li> </ul>	<ul style="list-style-type: none"> <li>potential illegal waste disposal</li> </ul>	Medium

**Notes:** \* Areas that have not been referred to as an AEC - applies to potential groundwater quality related to many sources.



### Groundwater contamination

Groundwater drawdown has the potential to result in the mobilisation of existing groundwater contamination during dewatering and as a result of groundwater ingress to excavations. Table 16-2 summarises potential groundwater contamination impacts during construction of the project.

There were no potential significant sources of groundwater contamination identified within 500 metres of the Orchard Hills, Bringelly services facility and Aerotropolis Core construction sites, and therefore the risk to the groundwater contamination migration at these sites is considered low.

**Table 16-2 Summary of potential construction impacts from temporary groundwater drawdown**

Construction site	Groundwater gradient change during construction	Potential impact
St Marys	<p>Drawdown between 10 metres at the deepest part of excavation to one metre at 340 metres from the excavation.</p> <p>Flow direction change from north westerly (towards South Creek) to an inward gradient towards the station box excavation (within 340 metre radius).</p>	<p>The change in local groundwater gradients could potentially temporary alter the flow of groundwater contamination from sources in the St Marys industrial area outside the construction footprint and from a localised chlorinated hydrocarbon plume from 1-7 Queen Street.</p> <p>The potential impacts from plume migration from outside the construction footprint is considered low due to the general low permeability of the aquifer. A temporary decrease in groundwater level 5 metres at 1-7 Queen Street could have an impact on chlorinated hydrocarbon concentrations in soil vapour at 1-7 Queen Street.</p>
Claremont Meadows services facility	<p>Inflows during construction are expected to be minor since the structure would be constructed within secant piled cut-off walls which would prevent horizontal flow of groundwater into the excavation. Changes in groundwater levels during construction are unlikely to occur outside of the excavation during the period of construction.</p>	<p>The location of the excavation site associated with the Claremont Meadows services facility is located approximately 300 metres north of the closed Gipps Street Landfill. A leachate collection trench is located along the northern and western boundary of the closed landfill at a depth of between 2.5 to 4 metres below ground level.</p>

### Salinity

Construction could result in excavation or erosion of potentially saline soils. This could potentially cause saline surface water runoff to waterways, surrounding soils or other areas if saline soils are reused elsewhere within the project. Saline soils can potentially cause a decline in soil structure, inhibit plant growth and impact freshwater aquatic ecosystems. Salinity can also potentially damage infrastructure, shortening its life and increasing maintenance costs. Excavation or disturbance of soils with a high salinity potential is likely to occur at the locations listed in Table 16-3.

Localised groundwater dewatering would occur around St Marys Station and Orchard Hills Station during construction, which would require the discharge of treated groundwater. Potentially saline groundwater could impact on surface soils and waterways if discharged without treatment; however, saline groundwater would be captured and treated prior to discharge.

### Acid sulfate soils

Excavation of soils with a potential for inland ASS would occur at a number of locations in the construction footprint. These areas are identified in Table 16-3. If ASS are disturbed, runoff from excavated soils can potentially be acidic and leach iron, aluminium and other heavy metals. These heavy metals and acids can leach into soil and groundwater, and contaminated runoff can potentially enter waterways and have negative impacts on water quality and aquatic ecosystems. This could also potentially result in infrastructure damage such as corrosion of metal and weakening of concrete structures such as viaduct pylons.

With the implementation of mitigation measures, the potential impact from the disturbance of ASS is expected to be localised and not significant.

**Table 16-3 Construction impacts – off-airport locations with high potential for salinity and acid sulfate soils**

Construction site	Area (see Figure 16-1)	Type of earthworks
Orchard Hills, off-airport construction corridor and stabling and maintenance facility	Blaxland Creek riparian zone	<ul style="list-style-type: none"> <li>• pilings and footing excavations for viaduct or bridge</li> <li>• surface disturbance for at-grade construction</li> </ul>
Off-airport construction corridor in Orchard Hills	Unnamed creek south of Patons Lane riparian zone	<ul style="list-style-type: none"> <li>• pilings and footing excavations for viaduct or bridge</li> <li>• surface disturbance for at-grade construction</li> </ul>
Off-airport construction corridor in Luddenham	Cosgroves Creek riparian zone	<ul style="list-style-type: none"> <li>• pilings and footing excavations for viaduct or bridge</li> <li>• surface disturbance for at-grade construction</li> </ul>

### Soil erosion

Construction of the project would temporarily expose the natural ground surface and sub-surface through the removal of vegetation, overlying structures (such as buildings) and excavation for stations, structures and foundations. The temporary exposure of soil to water runoff and wind could increase soil erosion potential. There is the potential that exposed soils – and other unconsolidated materials, such as spoil, sand and other aggregates – could be transported from the construction sites into surrounding waterways via stormwater runoff.

Erosion controls would be implemented and managed in accordance with Managing Urban Stormwater: Soils and Construction Volume 1.

#### 16.5.2 On-airport

##### Contamination

###### *Potentially contaminating construction activities*

As described in Section 16.5.1, construction activities could result in potential soil, surface water or groundwater contamination if adequate controls are not in place.

###### *Impacts associated with disturbance of existing contamination sources*

The areas assessed as low, medium and high risk for asbestos within the Western Sydney International (Department of Infrastructure and Regional Development, 2016b) and areas assessed as containing asbestos during further investigations as per the Western Sydney Airport Remediation Action Plan are shown on Figure 16-2. The asbestos was mainly identified in shallow soils and stockpiles sourced from the demolition of buildings containing asbestos and waste dumping.

Remediation of soils impacted by asbestos and other contaminants within the Western Sydney International Stage 1 Construction Impact Zone, as described in the Western Sydney Airport Remediation Action Plan, is anticipated to be complete prior to the construction of the project. However, given that the project would involve construction activities and construction depths that may vary from those associated with Western Sydney International, Sydney Metro would also develop a project-specific Remediation Action Plan (Sydney Metro Remediation Action Plan). The Sydney Metro Remediation Action Plan would be prepared in a manner consistent with the Western Sydney Airport Remediation Action Plan to the extent practicable, and would be applied to any contamination encountered by Sydney Metro that has not been remediated by Western Sydney Airport. Remediation may involve a mixture of excavation, capping, visual clearance and long-term management.

In non-remediated areas, such as areas outside the Western Sydney International Stage 1 Construction Impact Zone, areas not yet remediated or areas where asbestos has been capped and contained, there is a risk of construction workers being potentially exposed to asbestos fibres via disturbance of asbestos in soils and transport via wind, erosion and spoil transport.

In previous investigations, there were two high-risk areas for potential chemical contamination (i.e. non-asbestos contamination) within the construction footprint in the tunnel and viaduct segment precast facility (see Figure 16-2). Based on the previous investigations, the likelihood of chemical contamination presenting an unacceptable risk to ecological and human receptors was considered low. Potential chemical contamination, if encountered, is expected to be in isolated areas.

A preliminary conceptual site model and risk ranking in context of the project was completed and is presented in Appendix D of Technical Paper 8 (Contamination). The updated risk ranking relating to the construction footprint on-airport is summarised in Table 16-4.

**Table 16-4 On-airport potential contamination impacts and risk ranking**

Construction site	Potential contamination source	Overall risk ranking
On-airport construction corridor	Primarily asbestos contamination in soil with potential isolated areas of chemical contamination from past agricultural and light industrial land uses.  The project construction footprint would likely be remediated during Western Sydney International Stage 1 works prior to project construction. Some areas may contain capped contamination or subject to management plans where there is still a potential for contamination to remain in-situ and might be disturbed during construction.	Medium
Airport Business Park Station		Medium
Airport Terminal Station		Medium
Western Sydney International tunnel portal		Medium
On-airport construction support site (outside the Western Sydney International Stage 1 Construction Impact Zone)	Primarily asbestos contamination in soil with potential isolated areas of chemical contamination from past agricultural and light industrial land uses.	Medium
On-airport project alignment (tunnel)	Groundwater contamination within the Western Sydney International has been assessed as low risk with slightly elevated concentrations of heavy metals.	Low

Management of contaminated soils could result in other potential environmental impacts if transported off-site to be disposed at an appropriately licensed facility. These potential impacts would be reduced by on-site containment or off-site beneficial reuse under a resource recovery exemption. See Chapter 18 (Resource management) for further discussion of waste management.

### Salinity

Excavation of soils within an area of known high salinity in the Airport Terminal construction site would be required. If excavated, the runoff or reuse of high salinity soils could potentially cause localised impacts on soil and require mitigation measures.

There would also be widespread excavation and disturbance of soils with medium likelihood of soil salinity across the airport. Areas of saline soils, if encountered, could potentially contribute to local degradation of soil and water quality. Saline groundwater extracted from areas of the construction footprint could potentially adversely impact water quality in Badgerys Creek and Oakey Creek if not treated prior to discharge. The areas of known or high potential salinity are outside of the Western Sydney International Stage 1 Construction Impact Zone and would therefore remain a potential risk during construction of the project.

#### **Acid sulfate soils**

Excavation of ASS could potentially occur around the Badgerys Creek and Oakey Creek riparian zones associated with parts of the Airport construction support site, on-airport construction corridor, Airport Terminal and Airport Business Park construction sites. If ASS are present, they are not expected to occur in large quantities and potential impacts would be expected to be localised if encountered.

If ASS are disturbed, runoff from excavated soils can potentially be acidic and leach iron, aluminium and other heavy metals. These heavy metals and acids can leach into soil and groundwater, and impacted runoff can enter waterways and have negative impacts on water quality and aquatic ecosystems.

Prior to ground disturbance in areas of potential ASS, testing would be carried out to determine the actual presence of ASS. If ASS are encountered, they would be managed in accordance with the *Acid Sulfate Soil Manual* (Acid Sulfate Soil Management Advisory Committee, 1998).

#### **Soil erosion**

As described in Section 16.5.1, construction activities would result in the temporary exposure of soil to water runoff and wind, which could increase soil erosion potential if adequate controls are not in place.

## **16.6 Potential impacts – operation**

### **16.6.1 Off-airport**

The potential off-airport impacts of contamination, ASS and salinity on sensitive receivers during operation are described in the following sections.

#### **Contamination**

The potential contamination sources to soil, surface water and groundwater from the operation of the project include:

- potential chemical storage or use and activities at the stabling and maintenance facility including:
  - chemical and oil storage and use within the infrastructure maintenance shed
  - train wash facilities (oil and grease and cleaning chemicals)
  - oil within the traction substation
  - wheel lathe (heavy metals)
  - water quality treatment and on-site detention basin (secondary source of contamination)
- potentially contaminated stormwater and groundwater flowing into the open cut tunnel portals and water discharged for fire suppression in the tunnels
- potential chemical leaks or inadequately treated discharge from water quality treatment tanks at St Marys and Bringelly services facility used to treat stormwater and groundwater ingress or water discharged for fire suppression in the tunnels
- potential inadequately treated discharge from the water quality treatment basins at the stabling and maintenance facility
- stormwater runoff from tracks which may contain slightly elevated concentrations of heavy metals and oils from train operations.

The above could potentially cause localised soil and sediment contamination, and groundwater and surface water pollution if not managed appropriately. The receptors that could be potentially impacted include:

- ecological and human recreational receptors in Blaxland Creek, South Creek, Claremont Creek, Cosgroves Creek and Thompsons Creek
- on-site terrestrial ecological receptors
- on-site maintenance and commercial workers undertaking intrusive works.

#### **Acid sulfate soils**

Potential inland ASS are not expected to be disturbed during operation of the project.

#### **Groundwater salinity**

Differences in salinity between surface water systems that are linked with groundwater systems may result in saline soils affecting groundwater salinity, or saline groundwater affecting soil salinity.

Technical Paper 7 (Groundwater) modelled and predicted potential changes to groundwater levels associated with the permanent structures associated with St Marys Station and the Orchard Hills drained tunnel. The assessment predicted that groundwater level rise at these locations was unlikely to be significant, except in close proximity to the structures. The rise at St Marys Station was predicted to be south of the structure at 0.6 metres and 0.2 metres at Orchard Hills drained tunnel. A similar change in groundwater level is expected for Aerotropolis Core Station. The change was anticipated to be within the range of natural groundwater level fluctuation and not expected to have an impact on soil salinity.

Saline groundwater would be required to be managed during the project and is described in Chapter 15 (Groundwater and geology). Other sources of potential salinity are from the water quality and detention basins which could contain increased dissolved salts from runoff from the stabling and maintenance facility or saline soils.

### **16.6.2 On-airport**

#### **Contamination**

The potential contamination impacts on soil, surface water and groundwater from the operation of the project consists of:

- potentially contaminated stormwater and groundwater ingress into the tunnel portal that may contain slightly elevated concentrations of chemical contaminants
- stormwater runoff from tracks which may contain slightly elevated concentrations of heavy metals and oils from train operations.

The potential contamination impacts on soils, surface water and groundwater are expected to be negligible as the project is operating within an operational airport.

#### **Acid sulfate soils**

Potential inland ASS are not expected to be disturbed during operation of the project.

#### **Groundwater and salinity**

Groundwater modelling undertaken for Technical Paper 7 (Groundwater) indicated that the undrained tunnels and associated structures would cause relatively minor increases in groundwater levels over the long term. The greatest increase was predicted to occur closest to the tunnels, where the natural groundwater level is deep. It is unlikely to cause any impact in the shallow soils. Although there may be a broader increase in water levels upgradient, this change was generally considered to be within the range of natural groundwater level variation.

The sedimentation ponds for the project could potentially result in accumulation of saline sediments. These sedimentation ponds would be planted with salt tolerant species and therefore the potential impacts on soils and surface water are expected to be negligible. Minor changes to groundwater infiltration caused by the permanent soil and detention basins changes to infiltration are expected to be small with only minor changes in groundwater level occurring as a result.

## 16.7 Proposed management and mitigation measures

Environmental management for the project would be undertaken through an environmental management approach as 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 (see Section 16.7.1), and mitigation measures that would be applied during construction and operation to support achievement of the performance outcomes and other commitments in the Environmental Impact Statement (see Chapter 27 (Synthesis)).

### 16.7.1 Performance outcomes

Performance outcomes have been developed consistent with the requirements of the Planning Secretary's Environmental Assessment Requirements for the project. Performance outcomes for soil and contamination for the project are listed in Table 16-5 and identify measurable, performance-based standards for environmental management.

**Table 16-5 Performance outcomes – soils and contamination**

SEARs desired performance outcome	Project performance outcome	Timing
<b>Soils and contamination</b>		
The environmental values of land, including soils, subsoils and landforms, are protected	Contamination risks to human health and ecological receivers are minimised through effective management of existing contaminated land	Construction
Risks arising from the disturbance and excavation of land and disposal of soil are minimised, including disturbance to acid sulfate soils and site contamination	Contaminated land and soil within the footprint of the project is remediated where required, to ensure the land is suitable for the intended future land use	Operation

### 16.7.2 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 by the construction contractor in developing the Construction Environmental Management Plans (CEMP), sub-plans and other supporting documentation for each specific environmental aspect.

The Soil and Water 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 Soil and Water Construction Environmental Management Plan and the Western Sydney Airport Remediation Action Plan.

Mitigation measures that would be implemented under the provisions of the CEMF to address potential soil and contamination impacts are listed in Table 16-6.



Table 16-6 Soils and contamination mitigation measures

Ref	Proposed mitigation measure	Applicable location(s)
<b>Construction</b>		
SC1	<p>The Soil and Water Management Plan would incorporate the following measures:</p> <ul style="list-style-type: none"> <li>for low risk areas of environmental concern, worker health and safety measures, waste management and tracking for contamination would be outlined</li> <li>for medium and high risk areas of environmental concern, detailed site inspections and review of further available information would be undertaken prior to the start of construction</li> </ul>	All
SC2	<p>Based on outcomes of SC1:</p> <ul style="list-style-type: none"> <li>if a medium or high risk area of environmental concern is reassessed as low, the site would be managed in accordance with the Soil and Water Management Plan. This would typically occur where there is minor, isolated contamination that can be readily remediated through standard construction practices such as excavation and off-site disposal</li> <li>for medium risk areas of environmental concern, if the risk for the areas of environmental concern remains medium, visual inspections and monitoring would be performed during earthworks. If suspected contamination is encountered, the materials would be subject to sampling and analysis to assess management requirements in accordance with NSW Environment Protection Authority statutory guidelines</li> <li>for areas of environmental concern that remain or change to high risk, a Sampling, Analysis and Quality Plan would be prepared for Detailed Site Investigations or data gap investigations. The results from the site investigations would be assessed against criteria contained within the <i>National Environment Protection (Assessment of Site Contamination) Measure</i> (2013) and other applicable NSW statutory guidelines to assess whether remediation is required. Remediation works would be performed in accordance with the hierarchy of preferred strategies in the <i>Guidelines for the NSW Site Auditor Scheme</i> (NSW Environment Protection Authority, 2017). Where practical, remediation works would be integrated with excavation and development works performed during construction</li> </ul>	Off-airport

Ref	Proposed mitigation measure	Applicable location(s)
SC3	<p>Where information gathered from investigations for medium and high risk areas of environmental concern (as per mitigation measure SC1) is insufficient to determine the risk of contamination, a detailed site investigation would be carried out in accordance with the <i>National Environment Protection Measure</i> (2013) and other guidelines made or endorsed by the NSW Environment Protection Authority.</p> <p>Where data from the additional data review (mitigation measure SC1) or the detailed site investigation (mitigation measure SC2) confirms that contamination would require remediation, a Remediation Action Plan would be developed for the area of the construction footprint.</p> <p>If a Remediation Action Plan is required, it would be developed in accordance with NSW Environment Protection Authority statutory guidelines and a Site Auditor would be engaged. Remediation methodologies would be undertaken in accordance with Australian Standards and other relevant government guidelines and codes of practice.</p> <p>Remediation would be performed as an integrated component of construction and to a standard commensurate with the proposed end use of the land</p>	Off-airport
SC4	<p>If a duty to report to the NSW Environment Protection Authority under Section 60 of the <i>Contaminated Lands Management Act 1997</i> is triggered, or where a medium to high risk of contamination is identified, an accredited Site Auditor would review and approve the Remediation Action Plan, and would develop a Site Audit Statement and Site Audit Report upon completion of remediation</p>	Off-airport
SC5	<p>An unexpected finds procedure would be developed and implemented as part of the project Soil and Water Management Plan, outlining a set of potential contamination issues which could be encountered, and detailing the corrective actions to be implemented. The unexpected finds procedure would include a process for chemical and asbestos contamination and would generally include:</p> <ul style="list-style-type: none"> <li>• cessation of works within the affected area until inspection of the suspected contamination by a qualified contaminated lands consultant (verification by a certified contaminated land practitioner)</li> <li>• collection of soil samples for chemical or asbestos analysis based on observations</li> <li>• assessment of results against applicable land use or waste classification criteria in accordance with NSW Environment Protection Authority statutory guidelines</li> <li>• management of the contamination in accordance with NSW Environment Protection Authority statutory guidelines</li> <li>• the unexpected finds procedure for on-airport construction would be consistent with the Western Sydney Airport unexpected finds procedure detailed in the Soil and Water Construction Environmental Management Plan (Western Sydney Airport, 2019)</li> </ul>	All

Ref	Proposed mitigation measure	Applicable location(s)
SC6	Post construction, an inspection of construction, stockpiling and laydown sites and soil validation of redundant sedimentation/water quality basins would be undertaken to assess if further investigation and remediation is required. Investigation and remediation (if required) would be undertaken in accordance with the Soil and Water Management Plan (off-airport) and a project specific Remediation Action Plan that would be consistent with the Western Sydney Airport Remediation Action Plan (2019) (on-airport). All inspections, investigations and remediation would be undertaken by a qualified contaminated lands consultant (verified by a certified contaminated land practitioner)	All
SC7	Prior to ground disturbance in areas of potential acid sulfate soil occurrence, testing would be carried out to determine the actual presence of acid sulfate soils. If acid sulfate soils are encountered, they would be managed in accordance with the <i>Acid Sulfate Soil Manual</i> (Acid Sulfate Soil Management Advisory Committee, 1998)	All
SC8	Prior to ground disturbance in high probability salinity areas testing would be carried out to determine the presence of saline soils. If salinity is encountered, excavated soils would not be reused or would be managed in accordance with <i>Book 4 Dryland Salinity: Productive Use of Saline Land and Water</i> (NSW DECC 2008). Erosion controls would be implemented in accordance with the <i>Managing Urban Stormwater: Soils and Construction Volume 1</i> (Landcom, 2004)	All
SC9	Targeted groundwater investigations would be undertaken prior to construction to identify high salinity areas at risk from rising groundwater. Where high saline areas (>1000 $\mu\text{S}/\text{cm}$ ) are identified, measures such as planting, regenerating and maintaining native vegetation and good ground cover in recharge, transmission and discharge zones would be implemented where possible	All
SC10	Where the construction footprint is not used as part of the operational footprint (residual land), a site suitability assessment for the proposed land use would be undertaken in accordance with NSW Environment Protection Authority statutory guidelines	Off-airport
SC11	For works within Western Sydney International: <ul style="list-style-type: none"> <li>a review of further available information from Western Sydney Airport would be undertaken prior to the commencement of construction, which may include review of investigations, the Western Sydney Airport Remediation Action Plan and validation reports</li> <li>any remediation works (for contamination encountered by Sydney Metro that has not been remediated by Western Sydney Airport) would be undertaken in accordance with the Sydney Metro Remediation Action Plan, developed in a manner consistent with the Western Sydney Airport Remediation Action Plan (Department of Infrastructure and Regional Development, 2019) to the extent practicable</li> </ul>	On-airport

### **16.7.3 Consideration of the interaction between measures**

Mitigation measures in other chapters that are relevant to the management of potential soils and contamination impacts include:

- Chapter 14 (Flooding, hydrology and water quality), specifically measures which address surface water quality impacts
- Chapter 15 (Groundwater and geology), specifically measures which address potential groundwater contamination impacts, including mobilisation of existing saline groundwater
- Chapter 18 (Resource management), specifically measures which address spoil management and reuse targets, including management of contaminated spoil
- Chapter 23 (Hazard and risk), specifically measures which address storage and transport of dangerous goods and hazardous substances.