Chapter 2 Site context and environmental values



Existing land use in vicinity of Project

Existing land tenure (based on the northern rail access option)

Existing land tenure (based on the central rail access option)

Existing land tenure (based on the southern rail access option)

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Site context and environmental values

Chapter 2 provides a summary of the site for the Moorebank Intermodal Terminal (IMT) Project (the Project site), including a description of its regional setting and local context, environmental values and land tenure information.

The IMT is proposed to be situated on land in the suburb of Moorebank, in south-west Sydney (refer to Figure 1.1 in Chapter 1 – *Introduction*). The IMT would occupy approximately 220 hectares (ha) of Commonwealth land to the south of the M5 Motorway and east of Moorebank Avenue (this is referred to as the 'IMT site' within this Environmental Impact Statement (EIS)). This IMT site is currently occupied by the Department of Defence (Defence) for the purposes of the School of Military Engineering (SME), which is being relocated as part of the Defence Moorebank Units Relocation (MUR) Project.

In addition to development on Commonwealth land, the Project includes construction of a rail connection to the Southern Sydney Freight Line (SSFL). Three rail access options and associated indicative IMT layouts are assessed in this EIS, with the intention that the preferred option would be selected by the future operator/developer during detailed design.

The IMT site and the land required for construction of the rail connection to the SSFL are collectively referred to in this EIS as the 'Project site'.

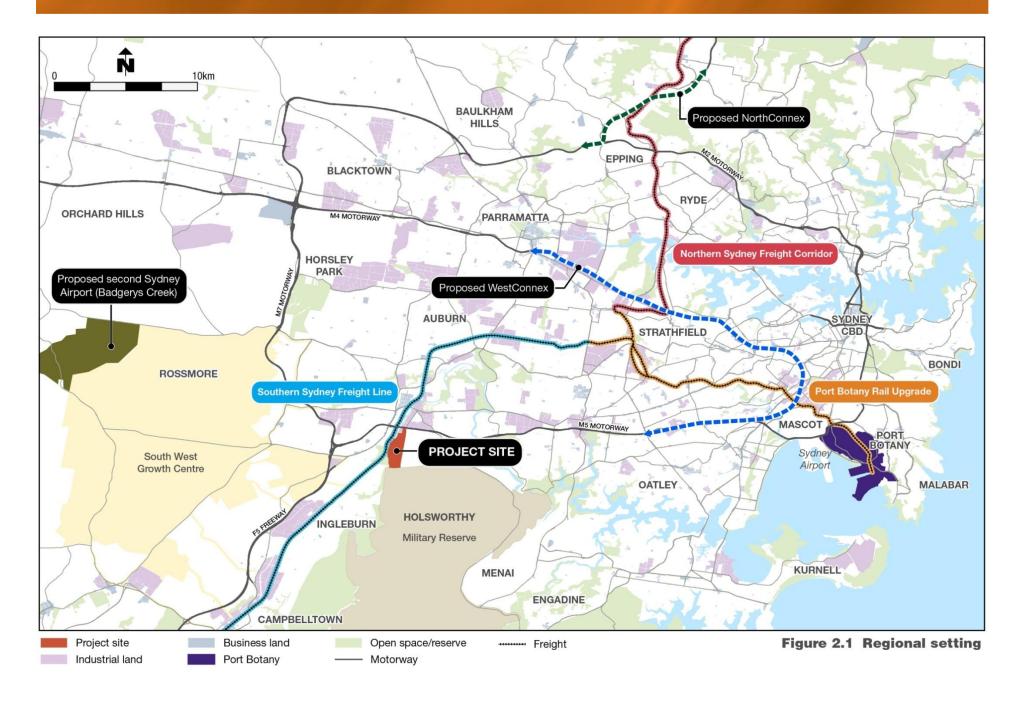
2.1 Regional setting

The regional setting of the Project is shown in Figure 2.1. The Project is located within the Liverpool local government area (LGA) approximately 30 kilometres (km) south-west of the Sydney central business district (CBD) and approximately 4 km south of the Liverpool CBD.

The Project would provide connectivity to Port Botany by rail, and to major regional and interstate roads and highways via the M5 and M7 Motorways. Sydney plays an integral role in the interstate freight network, both as a major market for cargo and as a hub of physical infrastructure linking markets in other states. Regional transport corridors extending through Sydney's west and south-west would be accessible from the Project site.

The Project site is located close to the Main South Railway Line (the corridor for the SSFL) to the west. The East Hills Passenger Railway Line is directly to the south of the Project site. The Project would connect directly to the SSFL and would form a key part of Australia's national rail freight network, which includes the planned Northern Sydney Freight Corridor and Port Botany Freight Line Upgrades (refer to Figure 2.1).

The M5 Motorway is located directly north of the Project site. The M5 Motorway is Sydney's main arterial route linking Sydney's city centre to its south-western suburbs and beyond. The M5 Motorway also forms part of the Sydney orbital network, a ring-road of motorways around Sydney.



The proximity of the Project site to the M5 Motorway provides accessibility to the major road transport routes servicing the Sydney metropolitan area, such as the M7 Motorway, as well as regional and interstate routes linking Sydney to other states. The Project site is also located in the vicinity of the planned South West Growth Centre and a concentration of industrial and business centres in Sydney's west and south-west. The proximity to industrial and warehousing developments was a contributing factor in the decision to locate the Project at Moorebank (as is further explained in Chapter 3 – *Strategic context and need for the Project*).

2.2 Local setting

The locality surrounding the Project site consists of the residential suburbs of Casula, Wattle Grove and North Glenfield, as well as industrial, commercial and Defence land. The Holsworthy Military Area (Holsworthy Barracks) is located south-east of the Project site and the Defence National Storage Distribution Centre (DNSDC) has until recently occupied leased land to the east of Moorebank Avenue with warehousing and open storage space for Defence vehicles. The DNSDC is currently in the process of moving to a site in West Wattle Grove as part of the Defence Logistics Transformation Program. This program commenced construction in December 2012 and is scheduled to be completed progressively from late 2014 to late 2016. It will modernise and enhance Defence's warehousing and distribution functions to provide optimum support to Defence operations (source:

http://www.defence.gov.au/jlc/dltp.html). The Main South Railway Line and the SSFL are located on the western side of the Georges River (refer to Figure 2.1 and Figure 2.2).

To the north of the Project site, the local area is generally characterised by industrial and commercial land uses, including ABB Australia's Medium Voltage Production Facility (a facility providing research and development, laboratories and factories) which is located adjacent to the M5 Motorway. Beyond the M5 Motorway to the east of the Georges River is a combination of industrial and commercial areas; to the west of the Georges River is the residential area of Liverpool.

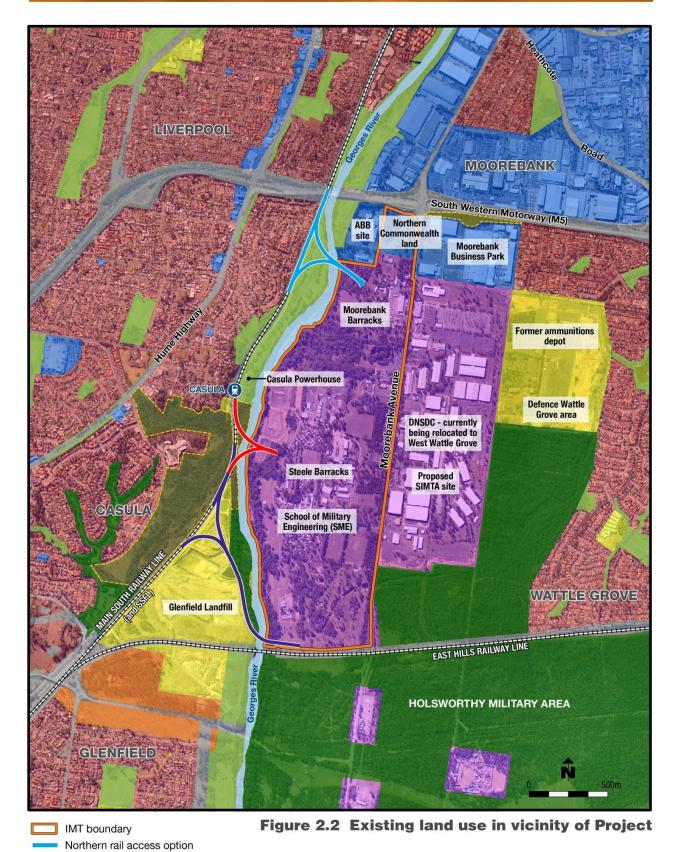
To the east of the Project site, land use is predominantly industrial and commercial, with extensive Defence land further east (including the Holsworthy Military Area to the south-east of the Project site). Land use immediately east of Moorebank Avenue and north of Anzac Road includes the privately owned Moorebank Business Park. Land east of Moorebank Avenue and south of Anzac Road is currently being vacated by the DNSDC as noted above.

The site south of the DNSDC site and immediately east of the Project site (across Moorebank Avenue) is currently subject to a proposal for the construction and operation of an IMT by Sydney Intermodal Terminal Alliance (SIMTA). In January 2012, SIMTA lodged an EIS with the NSW Department of Planning and Environment (NSW DP&E), which was placed on public exhibition between 28 March and 28 May 2012 and then again from 4 September to 21 October 2013. On 29 September 2014, the Planning Assessment Commission of NSW (PAC) determined to approve the SIMTA concept plan, with modifications and subject to further assessment requirements, including further traffic assessment. The PAC approval also placed a limit of 250,000 TEU per annum throughput on the SIMTA Stage 1 project application. If monitoring and modelling of the operation of Stage 1 can demonstrate an increase in the volume of freight will not exceed the capacity of the transport network with or without further mitigation measures, then subsequent development applications can increase to a total upper limit throughput cap of 500,000 TEU per annum. In addition, in June 2013 a draft EIS was placed on public exhibition under the (Commonwealth) Environmental Protection and Biodiversity Act 1999 (EPBC Act) and this was approved on 6 March 2014, also subject to conditions. Chapter 27 – Cumulative impacts identifies and assesses the cumulative impacts of the Project and development of the SIMTA site.

South and east of the SIMTA and DNSDC sites is heavily vegetated Commonwealth-owned land. East of the Commonwealth land is the residential suburb of Wattle Grove and further south-east of the Project site is the Holsworthy Military Reserve (refer to Figure 2.1 and Figure 2.2).

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To the west of the Project site is the Georges River. The riparian area along the river is generally well established with native and other vegetation (refer to Chapter 13 – *Biodiversity*). A small area on the east bank is cleared, providing boat access and a viewing platform for water-based activities and a Defence training area for heavy plant and machinery. The areas west and north-west of the Georges River mark a transition to low-density residential development and associated commercial developments and community facilities within the suburbs of Casula and Liverpool. The nearest residences to the Project site are located approximately 200 metres (m) west of the Georges River's western bank, and west of the SSFL.



Central rail access option
Southern rail access option

Land use (existing)
Commercial Rural
Defence Special uses
Infrastructure Vegetation
Open space/recreation Vegetation (environment protection)
Residential Watercourse

Recreational areas within the vicinity of the Project site include Leacock Recreation Park, on the west bank of the Georges River. The park includes Greenfield Creek, the Bellbird walking track and the State heritage listed Glenfield Farm. The Casula Powerhouse Arts Centre, within the suburb of Casula, is located on the west bank of the Georges River and is a former industrial facility that was converted to a multi-purpose contemporary arts facility in 1994.

The Project site is located within the Georges River Catchment, which is a sub-catchment of the Sydney Metropolitan Catchment. To the west of the Project site, the upper Georges River flows north towards the Chipping Norton Lakes Scheme, then east towards Botany Bay.

To the south of the Project site is the East Hills Railway Line. This line is used primarily for passenger rail services and is not intended to connect to the Project. Large areas of bushland occupy the area further to the south, including Defence's Military Training Area further to the south-east. The Glenfield Landfill, a large waste handling facility and refuse disposal site, is located to the south-west of the IMT site on the west bank of the Georges River.

2.3 Overview of the Project site

The majority of the Project site itself is located on land currently used for Defence purposes, including the SME and other minor Defence units. A large proportion of this land has been developed, and the centre of the Project site contains landscaped fields, administrative and operational buildings and access roads. The Royal Australian Engineers (RAE) Golf Course and Club is located towards the southern end of the Project site.

While the majority of the Project site is flat, the western edge slopes towards the Georges River, which runs along the western boundary.

Vegetation exists along the western edge of the Project site, with riparian vegetation along the banks of the Georges River, and between the minor Defence units and the SME. Native vegetation is also scattered across the developed parts of the Project site. Much of the IMT site has previously been extensively developed for Defence purposes; however, the IMT site still contains heritage and biodiversity values (as discussed further in section 2.4).

The edge of the Georges River is vegetated, particularly along the eastern bank. With the exception of a cleared area that provides a viewing platform to the west, a narrow corridor of riparian vegetation on the Project site (generally 25 m wide) provides a wildlife corridor and a buffer for the protection of soil stability, water quality and aquatic habitats. A wider strip of land (up to approximately 250 m wide) along the western edge of the Project site lies below the 1% annual exceedance probability (AEP) flood level. This area corresponds to the proposed conservation area that would become a dedicated riparian vegetation buffer between the Georges River and the proposed IMT (refer to Figure 7.4 to Figure 7.6 in Chapter 7 – *Project built form and operations*).

Existing land ownership and tenure at the Project site is identified in Figure 2.3 to Figure 2.5. The IMT site, including the area generally bounded by the Georges River to the west, Moorebank Avenue to the east, the East Hills Railway Line to the south and the M5 Motorway to the north, comprises three parcels of land:

- the SME site, legally described as Lot 3001 in Deposited Plan (DP) 1125930; and
- two smaller parcels of land to the north, legally described as Lot 100 and Lot 101 DP 1049508, and known as the 'Northern Commonwealth Land' and the 'Northern Council Land' respectively.

The IMT site would be used for the import/export (IMEX) and interstate intermodal terminals and the warehousing development, as discussed in Chapter 7 – *Project built form and operations*.

A rail connection to the SSFL would cross the Georges River either at the northern end, the southern end, or the centre of the IMT site's western boundary. Depending on the rail access option pursued, the Project would also require the development of land not owned by the Commonwealth land. Specifically:

• The northern rail access option would connect the IMT site to the SSFL by crossing the Georges River (which is Crown land) and an area referred to as the 'Northern Powerhouse Land', which is currently owned by LCC and legally described as Lot 10 DP 881265. The tie-in between the proposed rail link and the SSFL would also affect two small areas of land owned by Sydney Trains (formerly RailCorp) which are legally described as Lot 6 DP 1186254 and Lot 15 DP 881265.

Construction of the northern rail access option would also require temporary occupation of LCC land (Lot 22 DP 1132574), RailCorp land (Lot 6 DP 1186253), NSW Road and Maritime Services land (Lot 4 DP 746078, Lot 17 DP 881265 and Lot 16 DP 881265) and a small piece of land whose ownership is not known, but is deemed to be Crown land (Lot 1 DP 1070419)¹.

• The central rail access option would also connect the IMT site to the SSFL across the Georges River (Crown land), and would require development of Commonwealth land on the western bank of the Georges River, which is referred to as the 'hourglass land' and legally described as Lot 4 DP 1130937. Again the tie-in between the proposed rail link and the SSFL would affect land owned by Sydney Trains legally described as Lot 4 DP 1186349, Lot 102 DP 1143827 and Lot 1 and 3 DP 1130937.

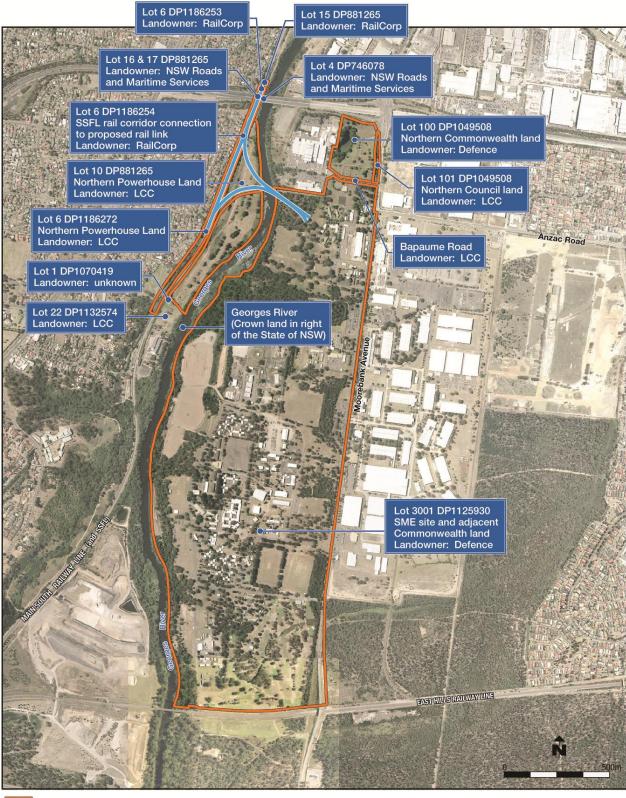
Temporary occupation of land within the Glenfield Landfill site (Lot 103 DP 1143827) as well as LCC land (Lot 1 DP 1115187, Lot 22 DP 1132574 and Lot 24 DP 1132574) adjacent to the Georges River may be required during construction of the central rail access option. In addition, a number of Sydney Trains lots (Lot 2 DP 1130937, Lot 5 DP 1186272, Lot 20 DP 1132574 and Lot 21 1132574) would be temporarily occupied during construction of the central rail access option.

• The southern rail access option would also connect the IMT site to the SSFL across the Georges River (Crown land). It would also cross the Glenfield Landfill site on the western side of the river, which is split into lots owned by Figela Pty Ltd (legally described as Lot 103 DP 1143827), and JC & FW Kennett Pty Ltd (legally described as Lot 104 DP 1143827, Lot 5 DP 833516 and Lot 51 DP 515696). The tie-in to the SSFL would also affect land owned by Sydney Trains, legally described as Lot 4 DP 1186349 and Lot 102 DP 1143827.

Temporary occupation of Commonwealth land (the hourglass land) (Lot 4 DP 1130937) and Sydney Trains land (Lot 1 DP 1130937) may also be required for construction of the southern rail access option.

Further details in relation to the land required for the Project are provided in Chapter 23 – *Property and infrastructure*.

This is a 7.15 square metre parcel of land. A manual title search has identified that a *Real Estate Property Act* 1900 title has not been created for this lot and the parcel is likely to be the result of an error during subdivision. Where land has no identified landowner, ownership reverts to the Crown.



Lot boundary

Northern rail access option

Figure 2.3 Existing land tenure (based on the northern rail access option)



Figure 2.4 Existing land tenure (based on the central rail access option)

Central rail access option



Figure 2.5 Existing land tenure (based on the southern rail access option)

Southern rail access option

2.4 Key environmental values

The following subsections provide a summary of the existing environment and the key environmental values of the Project site, including the main IMT site and the three rail access options, as shown on Figure 1.1 in Chapter 1 – *Introduction*.

Further details of the environmental values and constraints on the Project site are provided in Chapter 11 – *Traffic, transport and access* through to Chapter 27 – *Cumulative impacts* of this EIS, and the associated technical papers.

2.4.1 Ecology

Main IMT site

The main IMT site and the surrounding landscape are part of the Cumberland Plain Woodland of western Sydney. The Cumberland Plain Woodland has undergone extensive clearing, grazing and disturbance for agricultural, urban and industrial development, particularly in the 20th century. The vegetation on the Project site has been largely cleared and replaced with roads, buildings, playing fields and exotic grassland. Small stands of introduced and native trees are scattered throughout the Project site.

Four native vegetation communities have been recorded on the main IMT site, as described by Tozer (2003): Castlereagh Swamp Woodland, Castlereagh Scribbly Gum Woodland, Riparian Forest and Alluvial Woodland. The latter two communities are both listed as River-Flat Eucalypt forest under the NSW *Threatened Species Conservation Act 1995* (TSC Act). While all four communities form part of threat-listed ecological communities under the TSC Act, none of these communities correspond with a threat-listed community as listed under the EPBC Act.

Two threat-listed species of plant, *Persoonia nutans* (listed as endangered under the EPBC Act and TSC Act) and *Grevillea parviflora subsp. parviflora* (listed as Vulnerable under the EPBC Act and TSC Act), have been recorded on the main IMT site. Six additional threat-listed plant species have a moderate likelihood of occurrence within the main IMT site and the land affected by the three rail access options, based on their preferred habitats and known distribution; however, targeted searches undertaken for this Project have not detected these species.

Faunal surveys detected the Grey-headed Flying-fox (listed as Vulnerable under the EPBC Act and TSC Act) flying over the main IMT site. An earlier fauna study (Lesry 2003) recorded the presence of two threat-listed microbat species in the Project site: the Large-footed Myotis and the Eastern Bent-wing Bat.

Aquatic biodiversity in the lower freshwater reaches of the Georges River has been modified as a result of habitat degradation caused by changes in water flow volumes and velocities (including weirs upstream and downstream), increased nutrients and chemical pollutants, and the introduction of exotic species. The native species that exist here generally comprise disturbance tolerant species. Within the IMT site itself, some disturbed aquatic habitat exists, including Anzac Creek, which is identified as Class 3 (Minimal Fish Habitat) in accordance with Fairfull and Witheridge (2003). On site detention basins provide some foraging and breeding habitat for native frogs, reptiles and water birds.

Ten migratory species have been predicted to occur within the locality of the IMT site, but were not recorded during the surveys. Based on previous studies, the Regent Honeyeater (listed as Critically Endangered under the EPBC Act) has the potential to occur within the Project site, along with other migratory species of bird, as described in further detail in Chapter 13 – *Biodiversity*.

Rail access options

The vegetation communities affected by each of the three rail access options consist of open grassy woodland of the shale-derived soils of the Cumberland Plain in the west, and shrubby riparian woodland of the alluvial plains adjoining the Georges River riparian corridor in the east (refer Figure 13.2 in Chapter 13 – *Biodiversity*). There are no Threatened flora species present or with potential habitat within the rail access options.

A summary of the specific ecological characteristics relevant to each of the rail access options is provided in Table 13.2 in Chapter 13 – *Biodiversity*. As reflected in Table 13.2, the main difference between the existing ecological environments of the rail access options is the extent of vegetation, habitat and riparian zone associated with the Georges River.

2.4.2 Geology and soils

Main IMT site

The surface geology of the Project site comprises Quaternary and Tertiary alluvium consisting of silt, sand and gravels from Quaternary fluvial deposition. The Penrith 1:100,000 Series *Geological Series Sheet 9030* (Department of Mineral Resources 1991) indicates the presence of dark grey to black Ashfield Shale of the Wianamatta Group on the Project site, which is typically black to dark grey shales and laminates from the Triassic period. Further details are provided in section 15.3.1 in Chapter 15 – *Contamination and soils*.

Rail access options

The geology and soil makeup of land within the three rail access options has been found to be consistent with that of the main IMT site. That is, the underlying geology comprises silts, sands and clays from Quaternary fluvial deposition underlain by Tertiary clayey sand and clay. However, for the southern rail access option, due to the nature of known historical quarrying and landfilling activities within the Glenfield Landfill site, it is anticipated that significant disturbance of the surficial geology up to 30 m in depth and reinstatement with fill material has occurred.

2.4.3 Hydrology and water quality

The Project site is located within the Georges River Catchment, with the majority of the site draining into the Georges River, which forms the western boundary of the Project site. The Georges River extends approximately 60 km south-west of Sydney, with the Project site located in the upper section of what is referred to as the mid-Georges River.

The catchment area upstream of the Project site is largely undeveloped; however, downstream the catchment is becoming increasingly developed, extending out to the river mouth at Botany Bay. The section of river adjacent to the Project site is not subject to tidal influences because the Liverpool Weir, which is located approximately 2 km downstream and to the north of the Project site, governs minimum water levels. A small portion of the south-eastern part of the Project site drains to Anzac Creek, which is a temporary tributary of the Georges River and flows in a north-westerly direction through the south of the Project site. Further details are provided in section 16.2 of Chapter 16 – *Hydrology, groundwater and water quality*.

2.4.4 Air quality and existing noise environment

The suburbs of Casula, Glenfield and Wattle Grove border the Project site. These suburbs contains a number of potentially sensitive receivers in relation to air quality and noise and vibration, including residences, community facilities (such as the Casula Powerhouse Arts Centre), education institutions, places of worship, hospitals and child care and aged care facilities.

A number of industrial and non-industrial sources close to the Project site have the potential to influence the local airshed. These include existing industries to the east and north-east of the Project site, the existing Glenfield Landfill to the south-west, traffic emissions from the existing road network, emissions from diesel locomotives on the SSFL, diesel locomotive emissions from the East Hills Rail Line and emissions from aircraft at Bankstown Airport.

These sources are likely to give rise to emissions of particulate matter (total suspended particulates, particulate matter less than or equal to 10 μ m in aerodynamic diameter (PM₁₀) and particulate matter less than or equal to 2.5 μ m in aerodynamic diameter (PM_{2.5})) as well as nitrogen dioxide, sulfur dioxide, carbon monoxide, trace levels of volatile organic compounds (VOCs), heavy metals and odour. Baseline air quality conditions at the Project site are described further in section 17.2 of Chapter 17 – *Local air quality*.

The ambient noise environment was also measured for daytime, evening and night-time levels for existing road traffic noise and other noise sources. In summary, the background noise levels (RBLs) and the L_{Aeq} noise levels display a diurnal pattern – noise levels are typically lowest during night-time periods, when ambient influences are lower than during the daytime and evening periods. Further details are provided in section 12.2 of Chapter 12 – *Noise and vibration*.

2.4.5 European heritage values

Figures 21.1 to 21.4 in Chapter 21 – *European heritage* identify the location of European heritage items and sites within and around the Project site.

Main IMT site

In regard to European heritage values, the main IMT site includes memorial sites dedicated to military personnel who have served in the RAE Corps. The SME is also referred to as the Australian Army Engineers Group, and includes the RAE Memorial Chapel, RAE Monument, Major General Sir Clive Steele Memorial Gates, and Cullen Universal Steel Trust (CUST) Hut. It is identified as a local heritage item in Schedule 5 of the *Liverpool Local Environmental Plan 2008*. A number of these individual items also meet the criteria for Commonwealth and State significance (refer Table 21.7 in Chapter 21 – *European heritage*).

Prior to development of the Project, some items of heritage significance are proposed to be relocated in part or in full to Holsworthy Barracks as part of Defence's MUR Project. These include parts of the RAE Chapel and fittings, parts of the RAE Museum sandstone wall, the RAE Museum Collections, and various other memorials. The relocation of these items would have a dual impact on the historical context of the items relocated and on the residual Moorebank cultural landscape. Further details of the MUR Project are available in section 8.1 of Chapter 8 – *Project development phasing and construction* and at http://www.defence.gov.au/id/moorebank%5Cdefault.asp.

Following completion of the MUR Project, the residual Moorebank cultural landscape would be fragmented, with a loss of historical and social connection. While many of the intangible heritage values (e.g. associations with the memorials, chapel and museum) would be transferred to the new SME site (through the relocation of heritage buildings and heritage items) at Holsworthy, residual heritage values associated with the broader landscape setting, as well as more tangible elements of the landscape such as the archaeological deposits, the CUST Hut, the Royal Australian Air Force STRARCH Hangar, the dog cemetery and the commemorative garden, would remain.

Three potential archaeological deposits (PADs) also lie within the proposed construction footprint on the main IMT site. These are mapped in Chapter 21 – *European heritage* and the impact on these features is also described within that chapter.

Rail access connection options

There are no items of heritage significance that meet local, State or Commonwealth heritage listing thresholds to the west of the Georges River, on land that would be impacted by any of the three rail access connection options.

2.4.6 Aboriginal heritage values

Main IMT site

Field surveys undertaken on the main IMT site for the purposes of this EIS have indicated there are localised areas of Aboriginal archaeological sensitivity. The majority of Aboriginal sites identified within the main IMT site are surface scatters of artefacts and areas of archaeological deposit. Of interest, three scarred trees of possible Aboriginal origin were identified, as well as three PADs and three archaeologically sensitive landform types. These are mapped in Chapter 20 – *Aboriginal heritage*. The remainder of the main IMT site has been extensively developed for Defence purposes, and a large proportion of the site is either of low or no sensitivity.

Rail access options

One PAD was identified to the west of Georges River, on land affected by the northern rail access option. This PAD is located on an archaeologically sensitive landform as shown in Figure 20.3 in Chapter 20 – *Aboriginal heritage*.

No surface evidence of Aboriginal occupation was found on land that would be affected by the central and the southern rail access options; however, areas of potentially intact deposits were identified along the banks of the Georges River that may contain archaeological evidence.

2.4.7 Visual values

With the exception of the shoreline of the Georges River, the SME grounds have been largely cleared of vegetation and mainly house Defence buildings ranging from single-storey dwellings to storage facilities for plant and machinery. The buildings are surrounded by open lawn areas, while training facilities (such as plant and equipment training area) do not contain any vegetation. At the southern end of the Project site, the RAE Golf Course is largely open in character with stands of mature trees. The Georges River shoreline is heavily vegetated.

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The Project site is largely visible from high points along the M5 Motorway and along the length of Moorebank Avenue. Parks from which the Project site is visible include Carroll Park, St Andrews Park and Leacock Regional Park in Casula. The Project site is also visible from a number of residential properties backing onto these parks, and from the Main South Rail Line and SSFL. The East Hills Rail Line has direct views north into the Project site.

Further detail of the visual characteristics of the Project site and surrounding area and the view corridors are provided in Chapter 22 – *Visual and urban design*.