

5. Existing and future environment

Sections 5.1 and 5.2 in this Chapter present a summary of the existing social, cultural and biophysical environment along and surrounding the proposed SWRL corridor, based on input from various specialist studies, background reports and Technical Papers 1 to 8 in Volumes 2 and 3 of this Environmental Assessment. As described in Chapter 2 (Project Need), the South West Growth Centre has been earmarked for major development over the next 25-30 years. Therefore, Section 5.3 details how the existing environment is likely to change, based on this planned future development, building on the discussion already included in Chapter 2 and Section 3.2.1.

5.1 Existing social and cultural environment

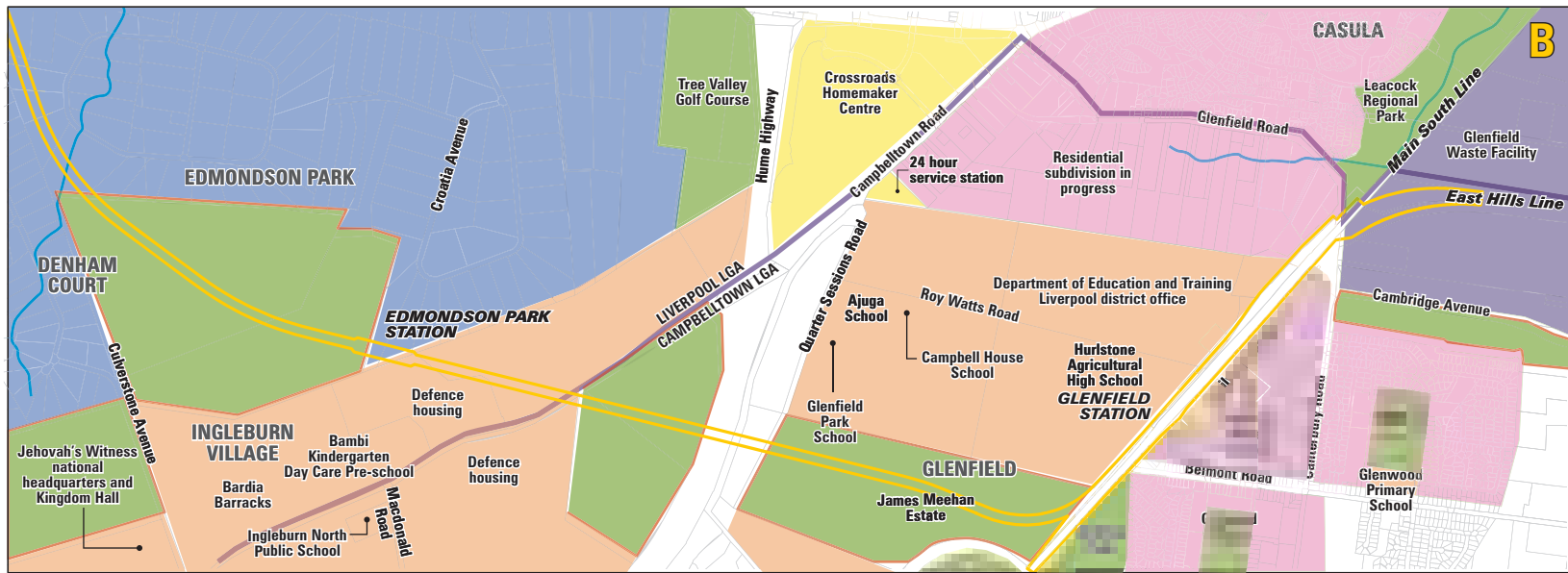
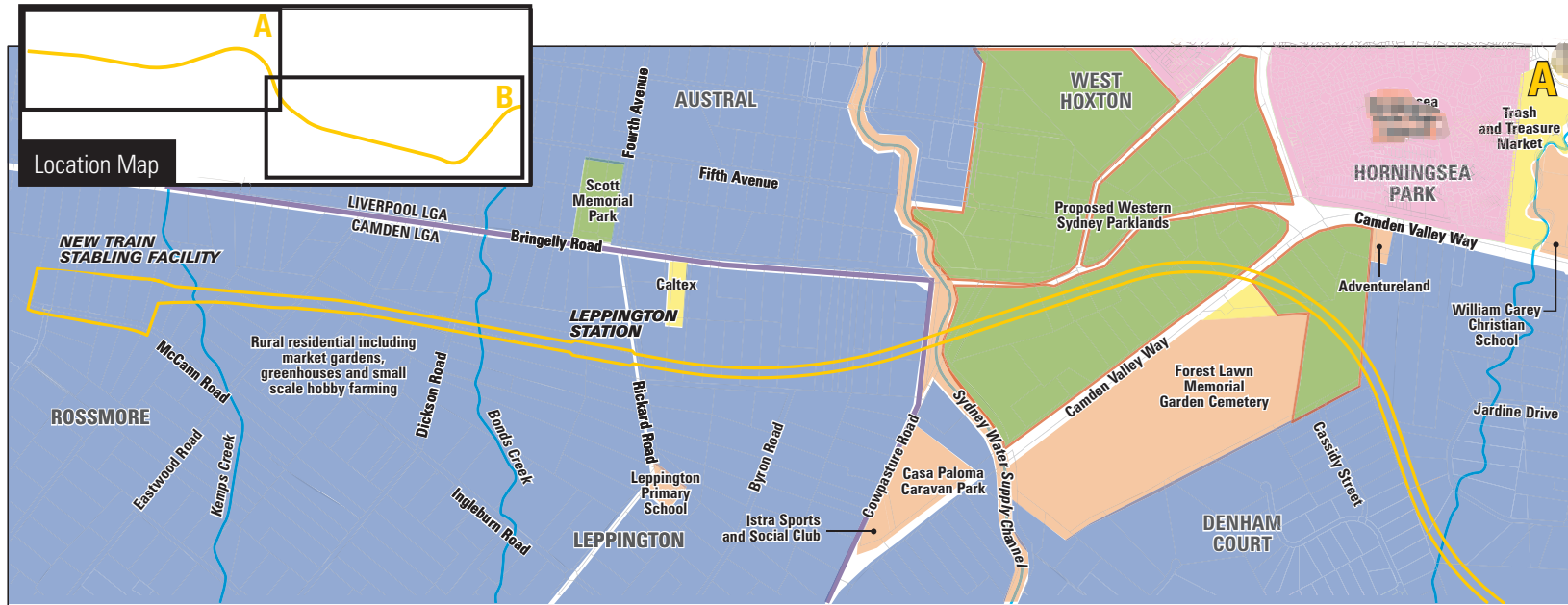
5.1.1 Land use and property

Existing land use within (approximately) 1 kilometre of the SWRL corridor was determined by review of 2005 aerial photography, relevant background studies and 'ground-truthing' via a survey on 17 July 2006. No private property was accessed during the survey. Existing land use patterns and key land use features in the vicinity of the SWRL are shown in Figure 5-1 and described below.

Glenfield North Junction to Hume Highway

Existing land uses patterns and key land use features along the Glenfield North Junction to Hume Highway section of the proposed SWRL corridor include:

- the Glenfield Waste Facility on the eastern side of the Main South Line and north of Cambridge Avenue
- on the eastern side of Railway Parade:
 - open space underneath high voltage power lines on the southern side of Cambridge Road
 - residential land uses between the Glenfield Road overbridge and Seddon Park
 - Glenfield Public School (a primary school)
 - Angels Garden Childrens Services, a preschool and long day care childcare service, on the corner of the north-eastern corner of Belmont Road and Railway Parade
 - a village retail and commercial precinct opposite Glenfield Station
 - open space at Seddon Park, between Salisbury Avenue, Newtown Road and Bunbury Curran Creek, including a scout hall.



- Proposed SWRL corridor
- LGA boundary
- Rural residential
- Special uses
- Residential
- Retail
- Industrial
- Public open space and recreation
- Other open space (including vacant land)

Figure 5-1 Existing land use

- on the western side of the Main South Line:
 - development of a residential estate to the north-west of the Glenfield Road overbridge (further details below)
 - the Department of Education and Training, Liverpool District Office
 - Hurlstone Agricultural High School, opposite Glenfield Station
 - Campbell House School (including Campbell House at the western end of Roy Watts Road and the Glenfield Tutorial Centre at the eastern end of the road)
 - Glenfield Park School
 - Ajuga School
 - private open space within the James Meehan Estate, including Macquarie Field House, on the northern side of Bunbury Curran Creek (further details below)
 - the Macquarie Links Estate, a residential estate on the southern side of Bunbury Curran Creek, and the Macquarie Links International Golf Course, located along the eastern side of the Estate. (Monarch Investments is developing a four star, 156 room hotel in the north-western corner of the estate, near the Hume Highway. Restaurants, bars, a health spa and childcare facilities are proposed as part of the hotel (Monarch Investments 2006a, 2006b).)

Residential development on Glenfield Road

Land on Glenfield Road in the Campbelltown Local Government Area, to the north of the Department of Education and Training Liverpool District Office, is currently undergoing residential subdivision and development. Development of this residential estate is expected to occur from 2006 to 2013 and is estimated to yield 1,000 dwellings (Campbelltown City Council 2006).

James Meehan Estate

The James Meehan Estate is located on the western side of the Main South Line to the south-west of Glenfield Station.

The NSW Government recently acquired the 58 hectare James Meehan Estate for the SWRL (Department of Planning 2006b). The land acquired is undeveloped and comprises vacant grassed land with sporadic trees. Macquarie Field House is located to the south of the estate and is not included in the land acquired. The house and the adjoining land are owned and used by the Presbyterian Church. There is no public access to the estate.

Edmondson Park release area

The Edmondson Park release area covers 834 hectares and is bounded by Camden Valley Way, Denham Court and the Hume Highway. Figure 3-3 shows the boundary of this release area, which is bisected by Campbelltown Road.

Existing land use patterns and key land use features in the vicinity of the SWRL corridor through the Edmondson Park release area include:

- the Ingleburn Gardens Estate residential development site (further details below)
- Ingleburn North Public School on the southern side of the intersection of Campbelltown and Macdonald Roads
- the former Ingleburn Army Camp in the southern half of the release area (further details below)
- rural-residential development in the northern half of the release area (further details below)
- the Tree Valley golf course on the southern side of Camden Valley Way, in the north-eastern corner of the release area
- the Adventureland amusement park on the southern side of Camden Valley Way, in the north-western corner of the release area
- the large-lot residential development of Denham Court (further details below).

Ingleburn Gardens Estate residential development site

The Ingleburn Gardens Estate is a 38 hectare development site located in the south-eastern corner of the Edmondson Park release area, on the south-western side of the intersection of Campbelltown Road and the Hume Highway.

In 2005, Monarch Investments received approval for a master plan for the estate from Campbelltown City Council. The master plan accommodates the SWRL corridor. The master plan includes a private school in the south-eastern corner of the estate. The school would cater for students from primary school to year 12. Construction of the school has commenced and is scheduled for completion in March 2007 (Monarch Investments 2005, 2006c). Approved subdivision works have also been undertaken at the site (Don Fox Planning 2006a). Other elements of the master plan are currently the subject of a staged development application and are described in Section 5.3.3. The staged development application seeks approval for development of 284 dwellings within a community title development at the site.

Currently, the site mostly comprises cleared land with a small area of remnant Cumberland Plain Woodland in the south-western corner of the site. There is no public access to the site.

Former Ingleburn Army Camp

The southern section of the Edmondson Park release area comprises the former Ingleburn Army Camp, which is Commonwealth land. The camp occupies 415 hectares of land either side of Campbelltown Road, between the Hume Highway and Zouch Road. Approximately 93 hectares of undeveloped land in the north-western corner of the camp has already been sold to Landcom (see Figure 5-1).

The camp comprises a mix of cleared land and remnant vegetation. Many of the structures associated with the camp have been removed from the site. Remaining structures include the Bardia Barracks, a parade ground, two ovals, a kitchen/dining hall complex, Bambi Kindergarten Day Care Pre-school on Stevens Road and prefabricated housing at Ingleburn village. With the exception of the Bambi Kindergarten Day Care Pre-school, prefabricated

housing and items within the Bardia Barracks (see below), none of these remaining structures and facilities are in use. Some parts of the site are fenced to minimise public access (Civitas Partnership 2004).

Ownership of land identified as Ingleburn Village (also known as Bardia Village) that falls within the area of the proposed SWRL corridor is currently split between the Department of Defence and the Defence Housing Authority. The entire Ingleburn Defence site has been identified by the Commonwealth for disposal. The entire site, including the Ingleburn Military Heritage Precinct and other heritage items, would be disposed of.

The Bardia Barracks is fenced and includes barracks, a lecture hall building, memorials and an entrance structure (Civitas Partnership 2004). Sale of the Commonwealth land would result in a change of use of the structures that are currently in use, including the Bambi Kindergarten Day Care Pre-school and the prefabricated housing.

Rural-residential development (northern section of the release area)

The northern section of the release area is within the suburb of Edmondson Park and comprises approximately 381 hectares of rural-residential development. A land use study by Edge Land Planning (2003) identified 167 rural lots in Edmondson Park of which 128 lots were used for rural residential uses only. Of the remaining lots, 23 were found to be used for extensive agricultural uses (this classification includes grazing), 8 were intensive plant uses (includes flowers, hydroponics, greenhouse igloos, market gardens, mushrooms and nurseries), 1 lot comprised intensive animal uses (includes cattle feedlots, fish farms, horse studs, poultry and goats), 3 were vacant lots, 2 were commercial land uses, 2 were public use lots (assumed to be the Tree Valley Golf Course and land owned by the Department of Defence), and 1 lot comprised native vegetation.

Land uses observed in the survey for this Environmental Assessment were primarily rural-residential on a mix of cleared and uncleared land with a scattering of other uses, including greenhouses, facilities for cat boarding and breeding, dog and cat clipping/grooming, dog boarding kennels and dog training. In addition, along the southern side of Camden Valley Way, some main road retailing land uses were present, such as landscaping and gardening supply and cut flower stores.

Most lots are currently between 0.8 and 3 hectares in size (Edge Land Planning 2003).

Denham Court

Denham Court is located to the north-west of the Edmondson Park release area and is characterised by a 2 hectare lot subdivision pattern. Edge Land Planning (2003) described Denham Court as comprising nearly all rural-residential uses with large houses set in extensive gardens. This land use pattern was confirmed in the survey for this Environmental Assessment.

Existing access to Denham Court is via Zouch Road and Denham Court Road only. The master plan for the Edmondson Park release area proposes new vehicle accesses from Edmondson Park town centre to Denham Court via Zouch Road in the south-western corner of the release area. No vehicular access is proposed from the northern-western corner of the release area into Denham Court (Civitas Partnership 2004).

Leppington and Rossmore

Existing land use patterns and key land use features along the section of the proposed SWRL corridor alignment through Leppington and Rossmore include:

- the Forest Lawn Memorial Gardens Cemetery
- a retail precinct on Camden Valley Way, north of the cemetery, including Lawrence Bros Power Equipment, Liquorstop and Leppington Farm, Pet and Hardware
- the Sydney Catchment Authority's Sydney Water Supply Canal
- the Casa Paloma Caravan Park and Red Lanterns Mobile Van Village
- rural-residential development either side of Bringelly Road (further details below)
- Leppington Primary School.

Edge Land Planning (2003) identified 725 lots at Leppington, of which 535 were rural-residential. Of the remaining lots, 126 were intensive plant uses (flowers, hydroponics, greenhouses), market gardens, mushrooms and nurseries, 18 were vacant, 17 were intensive animal uses, 15 were public uses, 10 were commercial, 2 were intensive agriculture and 2 comprised native vegetation. Most lots were between 0.8 and 3 hectares in size. This description of land uses extends well to the south of the proposed SWRL corridor.

Land uses observed in the vicinity of the proposed SWRL corridor at Leppington and Rossmore during the survey included market gardens, greenhouses and small-scale hobby farming.

Current zoning

This Section identifies the current zonings of land directly affected by the proposed SWRL corridor, as well as other land in the vicinity of the project. The purpose is to identify where existing land uses differ from the objectives of their current zoning.

Glenfield North Junction to Hume Highway

Land use in the Glenfield North Junction to Hume Highway section of the proposed SWRL corridor alignment is generally consistent with the objectives of the relevant current zonings under the Campbelltown (Urban Area) Local Environmental Plan 2002.

The relevant environmental planning instrument for the James Meehan Estate is the Campbelltown Local Environmental Plan No 112—Macquarie Field House. This plan applies to the James Meehan Estate, Macquarie Field House and part of the Macquarie Links Estate.

An objective of the Campbelltown Local Environmental Plan No 112—Macquarie Field House is to permit use of the site for integrated development, incorporating a hotel, convention centres, facilities for executive and staff development, certain types of accommodation and business activities, and recreational facilities. Some of these land uses exist, or are being developed (e.g. a hotel), within the Macquarie Links Estate.

Edmondson Park release area

Land in the Edmondson Park release area directly affected by the SWRL is zoned under the Liverpool Local Environmental Plan 1997 and the Campbelltown (Urban Area) Local Environmental Plan 2002.

Rezoning of the Edmondson Park release area was gazetted on 31 March 2006 (Department of Planning 2006a) via amendments to the Liverpool Local Environmental Plan 1997 and the Campbelltown (Urban Area) Local Environmental Plan 2002. As a result of the gazettal, the zonings that apply at the Edmondson Park release area changed from rural-residential to urban/residential, generally permitting different land uses to those currently occurring in the release area. Significant land use change is expected to occur over the next 15 to 20 years, with the first lots expected to be developed in 2007/08, as land in the release area is redeveloped.

In approving the rezoning, the Minister for Planning delayed rezoning all land owned by the Department of Defence until such time as the land proposed to be rezoned to '8(b) National Parks and Nature Reserves (Proposed)' in the Liverpool Local Government Area and '8(b) National Parks/Nature Reserve' in the Campbelltown Local Government Area is vested in the state or a public authority of the state of NSW. This land is, or is planned to be, reserved under the *National Parks and Wildlife Act 1974*.

This effectively means that the rezoning of Edmondson Park will occur in two stages:

- Stage 1 — land not owned by the Department of Defence (being the Ingleburn Gardens, Ingleburn North Primary School site, existing rural-residential development in the northern half of the release area and the Tree Valley golf course)
- Stage 2 — land owned by the Department of Defence (i.e. the former Ingleburn Army Camp).

Leppington and Rossmore

Land either side of Camden Valley Way between Edmondson Park and the Sydney Catchment Authority's Sydney Water Supply Canal is included within the proposed Western Sydney Parklands. The Parklands comprise a combination of existing facilities (e.g. Nurragingy Reserve, Eastern Creek Raceway and Dragway, Prospect Reservoir, Fairfield City Farm and the Pimelea and Plough & Harrow picnic areas) and new public open space. The section of the Parklands directly affected by the proposed SWRL corridor does not contain any recreational facilities and is not currently in public open space use.

Land west of Cowpasture Road in Leppington and Rossmore, directly affected by the proposed SWRL corridor, is zoned '1 (b) (Rural "B" (2 hectare) Zone)' under the Camden Local Environmental Plan No. 48. Agricultural land use (not including intensive horticulture or livestock keeping establishments) is permitted without consent in the '1 (b) (Rural "B" (2 hectare) Zone)'.

Impacts on the above existing land uses are described in Chapter 10 (Land use, property and infrastructure planning).

5.1.2 Existing traffic, transport, parking and access (Glenfield)

The transport context and existing traffic and transport environment in the South West region of Sydney is discussed in detail in Section 2.3 and Technical Paper 1 (Volume 2). Therefore, this Section focuses on the existing traffic and transport environment at Glenfield Station, which is the only existing Station affected by the SWRL and is proposed to be reconfigured as part of Stage B. The Section is summarised from Technical Paper 1.

Glenfield Station was originally built in 1869, upgraded in the early 1980s and reopened as part of the East Hills to Glenfield Rail Link in 1987. The Station can be accessed from the east via Railway Parade. Railway Parade is a single carriageway, with space for parking on both sides of the road. In proximity to the Glenfield Station entrance, Railway Parade is divided into two narrow lanes. The two outer lanes share an on-street cycle lane and, in practice, are only used for drop-off, pick-up and temporary parking. The median offers some protection to pedestrians that use a zebra crossing located in front of the station entrance. Glenfield Station is also accessible from the west by pedestrians generated by Hurlstone Agricultural High School, and by car along a single carriageway access road via Glenfield Road. Verbal advice from Campbelltown City Council (pers comms August 2006) identified that this access road is owned by the Department of Education. Bus access is limited to Railway Parade. The existing pedestrian overpass provides access to the station as well as convenient pedestrian access to land uses on both sides of the railway.

According to the *Compendium of CityRail Travel Statistics* (CityRail 2006), Glenfield Station's total daily patronage (both directions) amounts to approximately 9,500 passengers (2,480 boarding during the AM peak (6.00 to 9.30) and 2,280 alighting during the PM peak (15.00 to 18.30). Of this number, 63% travel to the station by car (30% park-and-ride and 33% kiss-and-ride), 21% walk, 11% catch a bus and the remaining 1% use other modes like cycling.

A total of nine bus services, comprising three routes, operate to Glenfield in the AM peak period. These are summarised in Table 5-1.

Table 5-1 Existing bus routes servicing Glenfield Station

Bus operator	Route number	Destinations served	Service frequency (AM peak Glenfield direction only)
Busabout	864	Ingleburn, Glenquarie, Glenfield, Glen Regent, Liverpool	3 services per hour
Busabout	865	Horningsea Park, Prestons, Glenfield Station (peak period service only)	3 services per hour
Interline	870	Glenfield, Macquarie Fields, Macarthur Square	3 services per hour

Source: Technical Paper 1

The *Commuter Carparking Study - Rail Stations from Glenfield to Macarthur* (G Creber and Associates 2004) estimated the number of cars parked at Glenfield Station to be around 480, equally split between the eastern and western sides of the rail corridor. Parking on the western side of the Station is located on the Department of Education access road. Parking on the eastern side of the Station is on RailCorp or Council-owned land, including parking lanes on Railway Parade and the parking lot opposite.

The above study also estimated the origin of cars parked at the Station, and found that the western car park accommodates demand from Prestons, Hoxton Park, Leppington, Bringelly and Oran Park. The eastern car park was found to predominantly serve Glenfield and other parts of Campbelltown LGA. Drivers would, however, have little difficulty in travelling to the opposite side of the railway. Around 25 % of commuter parkers (based on a number plate survey) were found to originate from areas located within the South West Growth Centre, which may be better served by stations proposed on the SWRL.

Impacts on the above existing traffic and transport conditions at Glenfield Station are described in Chapter 11 (Traffic, Transport, Parking and Access).

5.1.3 Existing acoustic (noise) environment

The existing acoustic (noise) environment varies along the length of the proposed SWRL corridor, with the range of commercial, suburban and rural land uses and as a result of the proximity of each location to major roads and the existing rail corridor.

Residential and other sensitive noise receiver locations are currently exposed to noise and vibration emissions from existing rail operations in areas adjacent to the existing rail corridor (at Glenfield). Additionally, a number of major roads run parallel to and/or intersect with the proposed SWRL corridor, including the Hume Highway, Campbelltown Road, Bringelly Road, Camden Valley Way and Cowpasture Road. The noise emissions from these roads contribute to increased ambient noise levels at nearby residential and other sensitive receiver locations.

Noise monitoring and noise sensitive receiver locations

As detailed further in Technical Paper 5 in Volume 3, ambient noise surveys were undertaken at seven representative locations between Casula (north of Glenfield) and Rossmore (west of Leppington). The noise monitoring locations were selected near proposed construction sites, proposed stations, the proposed stabling facility and adjacent to other above ground sections of the project. The monitoring locations and identified noise sensitive receivers along and surrounding the proposed SWRL corridor are shown in Figure 5-2.

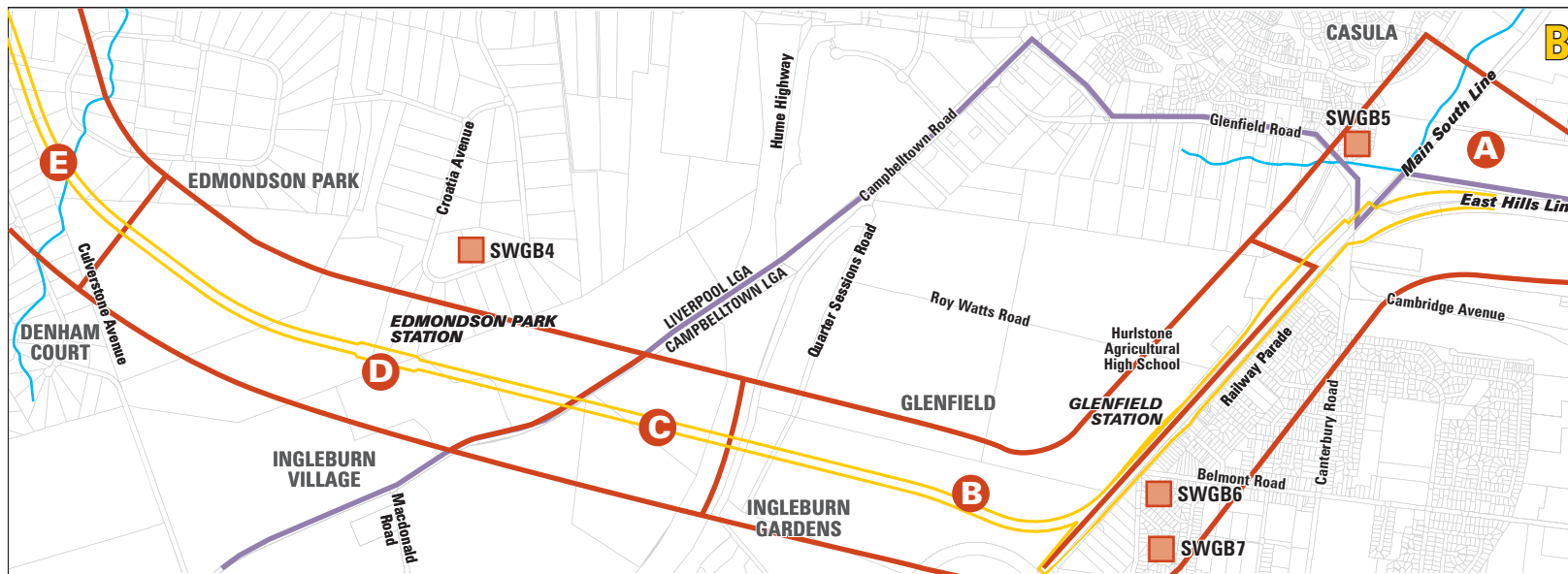
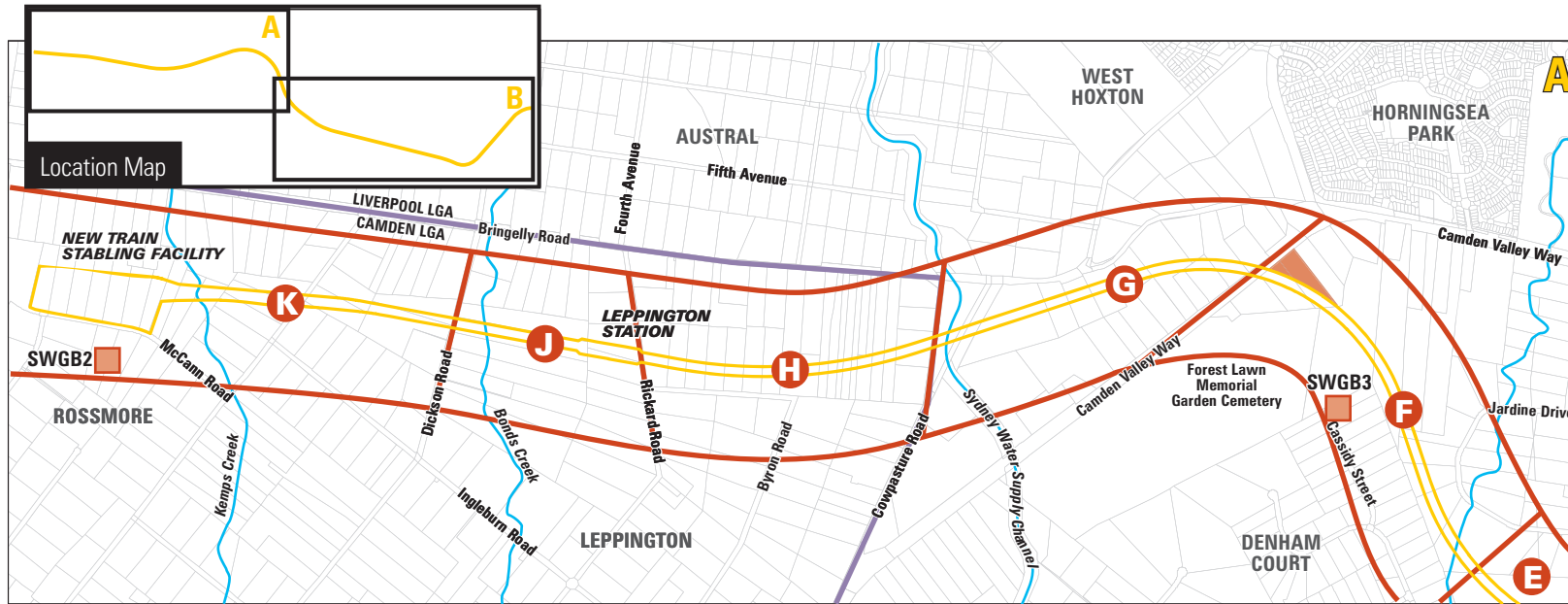
Ambient noise monitoring methodology



Ambient noise modelling was employed to establish the existing background noise levels, forming the basis for the assessment of the impact of noise emissions during construction of and operation of the proposed SWRL. Noise logging was undertaken using ARL noise loggers, type EL215 and EL316, positioned at each of the monitoring locations for at least one week, with continuous monitoring. (The loggers stored the results as statistical noise levels every 15 minutes.)

Noise monitoring results

The full results of the unattended noise monitoring are illustrated graphically in Appendix C of Technical Paper 5 (Volume 3). In order to determine the rating background level (RBL) during the daytime, evening and night-time periods, the L_{A90} (background noise levels or average minimum noise levels) were processed in accordance with the procedure in the Department of Environment and Conservation's *Industrial Noise Policy* (INP). The RBL is the overall single figure background level representing quiet ambient conditions in each assessment period.

The existing L_{Aeq} noise levels (the 'equivalent continuous noise level', sometimes also described as the 'energy-averaged noise level') for the daytime, evening and night-time periods were also processed in accordance with the INP procedure. These values represent the typical 'energy-averaged' noise levels during each assessment period. Table 5-2 summarises the processed noise levels.



 Proposed SWRL corridor
 LGA boundary

- A. East of Main South Line (Canal to Cambridge Avenue) and west of Main South Line (Glenfield Road overbridge to Slessor Road)
- B. Between Glenfield Road, Main South Line and Hume Highway
- C. Hume Highway to Campbelltown Road
- D. Campbelltown Road to Culverston Avenue

- E. Culverston Avenue (Denham Court)
- F. Culverston Avenue to Camden Valley Way
- G. Camden Valley Way to Cowpasture Road
- H. Cowpasture Road to Rickard Road
- J. Rickard Road to Dickson Road
- K. Dickson Road to Mark Road

Figure 5-2 Location of noise monitoring and noise sensitive receiver areas

Table 5-2 Summary of ambient noise levels at unattended noise monitoring locations

Monitoring location		Daytime noise level* (dBA)		Evening noise level* (dBA)		Night-time noise level* (dBA)	
		L _{A90}	L _{Aeq}	L _{A90}	L _{Aeq}	L _{A90}	L _{Aeq}
SWBG1	615 Bringelly Road, Rossmore	43	58	38	57	30	55
SWBG2	198 McCann Road, Rossmore	34	66	33	59	30	54
SWBG3	25 Cassidy Street, Denham Court	36	47	37	43	33	42
SWBG4	135 Croatia Avenue, Edmondson Park	38	49	42	48	37	45
SWBG5	15 Slessor Road, Casula	41	52	41	54	35	52
SWBG6	6 Newtown Road, Glenfield	47	59	46	58	39	57
SWBG7	18 Newtown Road, Glenfield	41	61	42	59	37	56

Note* Department of Environment and Conservation's preferred definition of daytime, evening and night-time hours. Daytime refers to standard daytime construction hours, namely 7.00am to 6.00pm Monday to Friday and 8.00am to 1.00pm on Saturday. Evening refers to the period 6.00pm to 10.00pm. Night-time refers to the period 10.00pm to 7.00am.

The summary results above are derived from an entire week of noise logging. The data has been segregated into the relevant time of day (daytime, evening and night-time) to assist in setting noise criteria for construction and train stabling operations.

5.1.4 Existing heritage

Indigenous heritage

A preliminary assessment of Indigenous (Aboriginal) archaeological and cultural heritage values was undertaken and is included in Technical Paper 6 (Volume 3). The existing Indigenous heritage environment is summarised in this Section, while the assessment approach, outcomes of the assessment and proposed additional studies and commitments are summarised in Section 15.1.

Aboriginal stakeholders

As part of the Environmental Assessment requirements for the SWRL project, TIDC is required to consult with Aboriginal stakeholder groups identified in the Growth Centres Commission's *Protocol for Aboriginal Stakeholder Involvement in the Precinct Assessment Process* (Context Pty Ltd. 2006a), a guideline specifically developed for precinct development in the South West and North West Growth Centres. The following stakeholder groups are known to have an interest in the study area for the SWRL and are listed in the protocol:

- Cubbitch Barta Native Title Claimants Aboriginal Corporation
- Darug Aboriginal Cultural Heritage Assessments
- Darug Custodian Aboriginal Corporation
- Darug Tribal Aboriginal Corporation

- Tharawal Local Aboriginal Land Council.

Although not listed in the protocol, the Northern Illawarra Aboriginal Collective has also identified its interest in the SWRL project and was consulted as part of the preliminary Aboriginal heritage assessment. Further details of this consultation are provided in Chapter 15.

Indigenous cultural heritage listings/recorded sites

A summary of the Commonwealth, State and local Indigenous heritage listings within the vicinity of the SWRL, and the register under which they are listed is included in Table 5-3.

Table 5-3 Summary of Indigenous heritage listings within the study area

Register	Status
Register of the National Estate	Campbelltown Indigenous Place (not in the area of impact of the proposed SWRL corridor)
National Heritage List	None
Commonwealth Heritage List	None
DEC Aboriginal Heritage Information Management System (AHIMS)	42 sites within a 10 kilometre by 5 kilometre corridor centred on the SWRL route
NSW State Heritage Register	None
Local environmental plans	None
Regional environmental plans	None

Source: Technical Paper 6

As indicated in Table 5-3, a search of the DEC AHIMS database showed 42 recorded Aboriginal objects and Aboriginal places in the vicinity of the project. These objects and places are mapped in Figure 5-3.

Approximately 64% of the 42 recorded sites are open camp sites; of these, 19 (70%) are located near creeks or creek lines. In addition to the sites recorded in the DEC AHIMS database, field surveys undertaken for Campbelltown and Liverpool Council (AMBS 2003) identified a further 15 sites of relevance to the study area (as shown on Figure 5-3). Of these 15 sites, all are on or near creek lines, and seven are open camp sites. Eight of the 15 sites are located in direct proximity to the proposed SWRL corridor. Of these eight sites, half are isolated finds and half are open camp sites (see definitions of site types below).

Of the 42 AHIMS registered sites and the 15 additional sites, only one site (TLC1) is located west of Camden Valley Way. However, as with the predominance of recorded sites in the north of the Cumberland Plain, these findings are likely to indicate that development (and, therefore, studies) has been more intensive in the eastern part of the SWRL study area, rather than that there is a lack of archaeological potential in the western part of the study area.

Descriptions and general landscape location factors for the most common types of Aboriginal archaeological sites found in the Sydney region are described below, including an assessment of whether they are likely to occur in the vicinity of the SWRL corridor:

- *middens*: This term generally refers to a heap of shells, but middens may also contain bone or other food remains, artefacts and/or other archaeological features considered to be the remains of past meals. Middens are unlikely to occur in the SWRL study area as the .