2. Initial assessment

2.1 Subject species, population and ecological communities as listed in DGR's

The DGRs prepared by OEH for the proposal list a number of species, a population and ecological communities that are to be considered as subject species in the preparation of the SIS. This includes:

- 22 birds.
- Five mammals.
- One endangered mammal population.
- One flora species.
- Two ecological communities.

Table 3 outlines the subject species and ecological communities and their conservation status under the TSC Act.

Each of the subject species and ecological communities have unique habitat requirements and known distributions. These are discussed briefly for each species and ecological community in Appendix B.

Table 3 - Subject species, populations and ecological communities listed in the DGRs issued by OEH.

Common name	Scientific name	NSW status
BIRDS		
Barking Owl	*Ninox connivens*	Vulnerable
Black-chinned Honeyeater (eastern subspecies)	*Melithreptus gularis gularis*	Vulnerable
Brown Treecreeper (eastern subspecies)	*Climacteris picumnus victoriae*	Vulnerable
Bush-stone Curlew	*Burhinus grallarius*	Endangered
Diamond Firetail	*Stagonopleura guttata*	Vulnerable
Flame Robin	*Petroica phoenicea*	Vulnerable
Gilberts Whistler	*Pachycephala inornata*	Vulnerable
Glossy-black Cockatoo	*Calyptorhynchus lathami*	Vulnerable
Grey-crowned Babbler (eastern subspecies)	*Pomatostomus temporalis temporalis*	Vulnerable
Hooded Robin (south eastern form)	*Melanodryas cucullata cucullata*	Vulnerable
Little Eagle	*Hieraaetus morphnoides*	Vulnerable
Little Lorikeet	*Glossopsitta pusilla*	Vulnerable
Painted Honeyeater	*Grantiella picta*	Vulnerable
Regent Honeyeater	*Anthochaera phrygia*	Critically endangered
Scarlet Robin	*Petroica boodang*	Vulnerable
Speckled Warbler	*Chthonicola sagittata*	Vulnerable

Common name	Scientific name	NSW status
Spotted Harrier	*Circus assimilis*	Vulnerable
Superb Parrot	*Polytelis swainsonii*	Vulnerable
Swift Parrot	*Lathamus discolor*	Endangered
Turquoise Parrot	*Neophema pulchella*	Vulnerable
Varied Sittella	*Daphoenositta chrysoptera*	Vulnerable
White-fronted Chat	*Epthianura albifrons*	Vulnerable
MAMMALS		
Corben's Long-eared Bat	*Nyctophilus corbeni*	Vulnerable
Eastern Bentwing Bat	*Miniopterus schreibersii oceanensis*	Vulnerable
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*	Vulnerable
Southern Myotis	*Myotis macropus*	Vulnerable
Squirrel Glider	*Petaurus norfolcensis*	Vulnerable
Squirrel Glider population in the Wagga Wagga LGA	*Petaurus norfolcensis*	Endangered population
FLORA AND ENDANGERED ECOLOGICAL COMMUNITIES		
Woolly Ragwort	*Senecio garlandii*	Vulnerable
White Box Yellow Box Blakely's Red Gum Woodland	Box-Gum Woodland	Endangered ecological community
Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	Inland Grey Box Woodland	Endangered ecological community

2.1.1 Likelihood of occurrence

An assessment of the likelihood of occurrence of species and ecological communities was completed during the preparation of the ecological assessment (GHD 2012b).

The literature review and database search identified 20 fauna species, one population, and one ecological community listed as threatened under the TSC Act that are known to occur or that may occur in the study area. The dates and sources of observation records were reviewed in order to assess the accuracy and relevance of each record.

Profiles were reviewed for each of the threatened biota using the information from the OEH (2011) threatened species website, the Department of the Environment (DoE) (2011) species profile and threats database and other sources where information was available. These profiles provide information on ecological requirements and other characteristics, including statewide, regional, and local abundance and distribution; and habitat requirements, including home range, feeding, roosting and breeding requirements.

Based on the outcomes of targeted surveys conducted for the SIS (see section 3.3), the revised known and likelihood of occurrence assessment indicated that 13 species (plus an additional bat species from a possible call record), one endangered population and one endangered ecological community are known to occur in the study area or locality and an additional seven species and one ecological community are likely to occur in the study area or locality. These species and the ecological community are outlined in Table 4.

Table 4 - Threatened species, populations and ecological communities known and/or likely to occur in the study area.

Species	Previously recorded in study area	Likelihood of occurrence in study area
BIRDS		
Barking Owl	No	Likely
Black-chinned Honeyeater	No	Likely
Brown Treecreeper	Present –previous surveys in subject site and study area	Known
Diamond Firetail	Present – current survey period in study area	Known
Flame Robin	Present – current survey period in study area	Known
Gilbert's Whistler	No	Likely
Grey-crowned Babbler	Present – current and previous surveys in subject site, study area and locality	Known
Hooded Robin	No	Likely
Little Eagle	Present – current survey period in study area	Known
Little Lorikeet	Present – current survey period	Known

Species	Previously recorded in study area	Likelihood of occurrence in study area
	in study area	
Major Mitchell's Cockatoo	Present – current survey period in study area	Known
Scarlet Robin	Present – current survey period in subject site	Known
Speckled Warbler	Present – current survey period in study area	Known
Spotted Harrier	No	Likely
Superb Parrot	Present – current and previous surveys in subject site, study area and locality	Known
Swift Parrot	Present – current and previous surveys in subject site, study area and locality	Known
Turquoise Parrot	No	Likely
Varied Sittella	No	Likely
MAMMALS		
Squirrel Glider	Present – current and previous surveys in subject site, study area and locality	Known
BATS		
Southern Myotis	Present – current survey period in study area	Known
Yellow-bellied Sheathtail-bat	Present – current survey period in study area (probable call identification)	Known
ENDANGERED ECOLOGICAL COMMUNITIES		
Box-Gum Woodland	Present – current and previous surveys in subject site, study area and locality	Known

2.2 Study area general description

The landscape is dominated by a matrix of agricultural land and native woodland. The Sydney to Melbourne Rail Line is located east of the existing highway until the existing bridge where it crosses the highway and then is on the west. Two residences are located west of the subject site at the northern end and one residence is located east of the proposal at the southern end. A

quarry is located about 800 metres east of the proposal and another is located about 800 metres south-east of the subject site (Figure 2).

2.2.1 Historical attributes

Silvalite Reserve was formerly a Travelling Stock Reserve (TSR), which was informally divided to operate as two reserves. The northern portion was leased for grazing purposes until the mid 1980's, while the southern portion was conservatively grazed.

The Red Hill Road bypass was completed in 2007 and effectively split the reserve into two (north and south) sections. A small half hectare bushfire occurred in the northern end of the reserve in early 2012. No other previous fire information is known or recorded in literature.

The Wiradjuri Walking Track was initiated in the 1970's by the Department of Lands in order to provide public access to Crown Land Reserves within the urban area of Wagga Wagga. The track passes through the Silvalite Reserve and the E2 areas of Lloyd and remains in operation.

The former fuel depot, to the south of the existing bridge, operated from World War Two until the early 1980's and was used as a fuel storage depot and distribution point. The site still contains a series of underground tanks, pipes and other infrastructure. The western and northern parts of the decommissioned fuel depot are known to contain contaminated materials (RTA 2011b).

As part of the biocertification for the Wagga Wagga LEP, part of the suburb of Lloyd was zoned as Environmental Conservation (E2) in order to offset the impacts of future development within the identified Wagga Wagga biocertified areas. The E2 zone has a varied history of land use, which includes grazing, gravel extraction and quarrying, soil conservation works and informal recreation. The area was previously targeted for illegal dumping of household rubbish and trade waste due to ease of public accessibility. There is also evidence that Aboriginal communities used the E2 area historically with artefacts found at several locations.

The land is traditionally rural and has been transferred to public ownership as part of Planning Agreements that support the rezoning and development of adjoining land for residential development (WWCC 2010).

2.2.2 Current broad habitat attributes

The study area is located in the Wonga Hills and Ranges Mitchell Landscape, which comprises rolling hills, low rises and ridges. This landscape is 88 per cent cleared and is therefore considered an over cleared landscape (>70 per cent cleared).The general elevation is 250 metres to 370 metres above sea level. Local relief is about 50 metres (Mitchell 2003).

The terrain of the study area is undulating. No permanent watercourses occur in the study area. A deeply eroded ephemeral drainage line begins near the proposed bridge and runs through Silvalite Reserve to the north. The northern half of the proposal drains to this drainage line. There are a number of farm dams in the study area mostly in the east and south.

The study area has been disturbed through past and current development for agriculture, industrial and residential purposes, as well as for the construction of linear infrastructure such as the Sydney to Melbourne Rail Line and existing Olympic Highway. Land in the north of the study area consists of Silvalite Reserve which contains native canopy vegetation throughout and also private cleared agricultural land with scattered paddock trees. Silvalite Reserve in the north and the eastern parts of the study area are zoned E2 (Environmental Conservation) and include native canopy vegetation and derived native grassland. Land in the south of the study area comprises cleared agricultural land that is dominated by pasture improved land with scattered paddock trees. The married quarters of the Kapooka Military Area is located in the west of the study area. Where residences have been constructed in this area, there is no native

vegetation; however, there is a patchily connected corridor of native trees that occurs in the roadside of Camp Access Road.

Soils of the landscape contain stony, thin red and brown texture-contrast soils merging to yellow harsh texture-contrast soils on valley floors. The subsoils have high salinity (Mitchell 2003).

Chen and McKane (1997) identify three soil types within the study area: Lloyd; Becks Lane and Pulletop.

The Lloyd soils have a high erosion hazard and comprise:

- Shallow soils (less than 50 centimetres deep) consisting of paralithic hepticrudosols on crests, ridges and upper slopes.
- Moderately deep soils (50-100 centimetres deep) consisting of mesotrophic red chromosols on mid to lower slopes.

The Becks Lane soil type has a high erosion hazard and comprises:

- Moderately deep soils (80-100 centimetres deep) consisting of haplic and bleached red and brown chromosols on slopes.

The Pulletop soil type has a moderate erosion hazard and comprises:

- Shallow to moderately deep soils (40-100 centimetres deep) consisting of mesotrophic red chromosols on crests, ridges and upper slopes.
- Moderately deep soils (80-150 centimetres deep) consisting of bleached and haplic red chromosols on mid to lower slopes.

Hollow-bearing trees are distributed throughout the study area but occur more commonly in the north and central parts of the study area where native vegetation is more dominant. Fauna habitats in the west and south of the study area are largely restricted to scattered paddock trees and isolated trees in roadside reserves and the Kapooka married quarters. There is little to no mid storey or shrub layer in these areas and connectivity is limited.

Silvalite Reserve in the north and parts of the E2 zone in the east provide structurally complex habitats that include:

- Hollow-bearing old eucalypts.
- Stags.
- Middle aged canopy vegetation.
- Regenerating and regrowth canopy vegetation.
- A midstorey of *Acacias*.
- A native grassy ground layer.
- A species rich native groundcover layer.
- Patchy connectivity to other native vegetation in the locality.

Floristic surveys of the study area identified 127 species (see Figure 7). Of this number, 120 flora species, (71 native and 49 introduced) occur in the subject site. The highest diversity of species occurs in the middle of the subject site and the lowest diversity in the southern end of the subject site.

Subject site vegetation types

Four main vegetation types were identified in the subject site during field surveys:

- Grassy White Box Woodland.

- Plantations.
- Deane's Wattle and introduced groundcover vegetation.
- Introduced groundcover vegetation.

Table 5 outlines the vegetation types present within the study area and their corresponding plant community types as listed in the NSW plant community type's database.

Table 5 - Vegetation communities present within the subject site, and corresponding NSW plant community type (PCT)

Mapped vegetation community	Vegetation types
Grassy White Box Woodland	◗ Formation: *Grassy Woodlands* (Keith 2004) ◗ Class: *Western Slopes Grassy Woodlands* (Keith 2004) ◗ PCTID 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion. ◗ MR561: Grassy White Box woodland on well drained podsolic clay soils on hills in the NSW South Western Slopes Bioregion (Benson 266).
Planted vegetation (non-local)	N/A

Grassy White Box Woodland

The study area consists of woodland dominated by White Box (*Eucalyptus albens*), which complies with the classification criteria for the NSW plant community type (PCT) White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion (PCTID 266) (Table 5). All vegetation in this community is in moderate/good condition as defined under the BioBanking Assessment Methodology (BBAM) (DECC 2009a).

Due to the presence of White Box, a predominantly native understorey and other distinguishing characteristics, the vegetation community complies with the classification criteria for the endangered ecological community *White Box Yellow Box Blakely's Red Gum Woodland* (TSC Act) (Plate 1).

Plantations

Patches of planted non-endemic native vegetation are located on the proposed realignment of Camp Access Road west of the proposed road-over-rail bridge (Plate 2). Commonly occurring planted species include Lemon-scented Gum (*Corymbia citriodora*) and Bloodwood (*Corymbia* spp.).

Groundcover vegetation in areas of planted vegetation is dominated by introduced species and is considered to be in low condition as defined under the BBAM (DECC 2009a).

Deane's Wattle and introduced groundcover vegetation

An area of Green Wattle (*Acacia deanei*) with introduced groundcover vegetation is located at the site of the proposed bridge (Plate 3). This area is considered to be in low condition, as defined under the BBAM (DECC 2009a).

Introduced grassland

Areas of introduced grassland are located at the southern and northern ends of the proposal, and just north of the proposed bridge (Plate 4). These areas are considered to be in low condition, as defined under the BBAM (DECC 2009a).

Plate 1 – Grassy White Box Woodland in the south of the subject site.

Plate 2 – Plantation of Lemon-scented Gum in the subject site.

Plate 3 – Deane's Wattle and introduced groundcover in the subject site.

Plate 4 – Introduced grassland in the south of the subject site.

Study area vegetation types

White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion (PCTID 266) is the most commonly occurring vegetation type in the study area. Parts of the study area were mapped by OEH as native grasslands; however these are likely to be derived grassland of PCTID 266 rather than part of the Keith vegetation Class of Riverine Plain Grasslands. Of the 208.4 hectares of the mapped vegetation in the study area, 168.3 hectares is Box-Gum Woodland which is listed as endangered under the TSC Act.

Four vegetation types occur in the study area:

- White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes bioregion.
- White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South-western Slopes bioregion.
- Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South-western Slopes bioregion.
- Planted woody vegetation.

Woodland on the south-eastern side of the proposed road-over-rail bridge is predominantly grassy with an overstorey of White Box and no shrubs. Woodland on the north-western side of the proposed bridge is a mix of mature and regenerating White Box with a grassy understorey and midstorey of regenerating Golden Wattle (*Acacia pycnantha*).

Most of this vegetation community complies with the classification criteria for the threatened ecological community Box-Gum Woodland listed as endangered under the TSC Act. In the study area, areas of native grassland that are likely to have once supported a canopy of White Box were classified as the derived grassland form of the community.