

PART

C



Impact
assessment –
construction
infrastructure

INLAND RAIL—NARROMINE TO NARRABRI
ENVIRONMENTAL IMPACT STATEMENT

PART C

Impact assessment key
construction infrastructure

INLAND
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CHAPTER C1 Assessment of multi-function compounds



Narromine to Narrabri
Environmental Impact Statement

ARTC

The Australian Government is delivering
Inland Rail through the Australian
Rail Track Corporation (ARTC), in
partnership with the private sector.

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C1. Assessment of multi-function compounds

This chapter provides a summary of the potential impacts of the multi-function compounds on the local environment as a result of the Narromine to Narrabri project (the proposal). A full copy of the assessment results is provided in relevant technical reports.

C1.1 Overview of multi-function compounds

As described in section A8.9.2, three multi-function compounds would be established at Narromine South, Curban and Narrabri West as follows:

- ▶ Narromine South—located where the proposal would connect with the Parkes to Narromine section of Inland Rail, about 8 kilometres (km) south of Narromine. It would have an area of about 158 hectares (ha). Access to the compound would be provided by a new access road, about 1.8 km long, from Tomingley Road. Some bulk materials, such as rail and sleepers, may also be delivered to the compound by rail using the Parkes to Narromine Line.
- ▶ Curban—located where the proposal would connect with the Dubbo to Coonamble Line, about 20 km north-west of Gilgandra. It would have an area of about 118 ha. Access to the compound would be from Bardens Road and Wyuna Road, which border the compound and provide regional connectivity via the Castlereagh Highway. Some bulk materials, such as rail and sleepers, may also be delivered to the compound by rail using the Dubbo to Coonamble Line.
- ▶ Narrabri West—located where the proposal would connect with the Narrabri to Walgett Line, about 4 km south-west of the Narrabri town centre. It would have an area of about 102 ha. Access to the compound would be from Yarrie Lake Road, which borders the compound. Some bulk materials, such as rail and sleepers, may also be delivered to the compound by rail using the Narrabri to Walgett Line.

The location of the proposed multi-function compounds is shown in Figure A1.3 and in the maps in Part E.

Establishing the multi-function compounds would consolidate as many facilities as possible in discrete locations, minimising the potential for land use and associated impacts compared with distributing required facilities throughout the proposal site.

All multi-function compounds would require new connections to public roads. The compounds would be powered by generators. Sewage would be captured into holding tanks and would be pumped out as required. Water would be stored in water tanks with fresh water delivered as required. It is expected the site communication would be via a dedicated satellite link or other connection. All stormwater captured on each of the sites would be reused for irrigation, dust suppression or discharged via an onsite sedimentation basin. The sites would be bunded to prevent inundation up to the 5% annual exceedance probability (AEP) flood event.

C1.1.1 Establishment

Establishment of the multi-function compounds would involve the following activities:

- ▶ Consult landowners/occupants (where required) and ensure land access is available
- ▶ Install site environment management and traffic controls, including drainage and erosion management controls, in accordance with the construction environmental management plan (CEMP) (see chapter D5)
- ▶ Erect temporary site fencing to ensure construction areas and areas to be impacted are clearly delineated
- ▶ Vegetation clearing and removal, where required, including slashing, mulching and stockpiling for reuse
- ▶ Topsoil stripping (where present) and stockpiling for reuse
- ▶ Establish access points off public roads
- ▶ Install site infrastructure (e.g. site offices and amenities)
- ▶ Utility relocation or protection, where required
- ▶ Install water infrastructure, including diversion drains (for up-slope surface flow) and sedimentation basins
- ▶ Delivery of plant and equipment.

C1.1.2 Use

During use of the multi-function compounds, a range of activities would be undertaken to support construction. Activities would include use of:

- ▶ Offices and amenities
- ▶ Materials storage
- ▶ Concrete batching plants
- ▶ Fuel/hazardous material storage
- ▶ Plant and equipment refuelling
- ▶ Maintenance areas
- ▶ Welding yard
- ▶ Concrete pre-cast yard (Curban only).

In addition, the Narromine South and Narrabri West multi-function compounds would also include temporary workforce accommodation (see chapter C2).

At the end of construction, all disturbed areas not required for the proposal's operational infrastructure would be rehabilitated. Finishing and rehabilitation would be undertaken progressively. Site rehabilitation would be carried out in accordance with the rehabilitation strategy (see section A8.7).

C1.2 Existing environment

The existing environment at each of the multi-function compounds is summarised in Table C1.1. Further information on the existing environment is provided in the relevant chapters in Part B.

TABLE C1.1 EXISTING ENVIRONMENT FOR THE MULTI-FUNCTION COMPOUNDS

Aspect		Narromine South	Curban	Narrabri West
Site description	Location	<p>The site is about 8 km south of Narromine, within agricultural land, and is generally bounded by:</p> <ul style="list-style-type: none"> ▶ Parkes to Narromine Line to the west ▶ Craigie Lea Lane to the north ▶ Tomingley Road to the east ▶ Narwonah Siding Road to the south. <p>The Narrabri South temporary workforce accommodation would also be located at this site.</p>	<p>The site is about 20 km north-west of Gilgandra, within agricultural land, and is generally bounded by:</p> <ul style="list-style-type: none"> ▶ Farmland to the west ▶ Dubbo to Coonamble Line to the north ▶ Wyuna Road to the east and south. 	<p>The site is about 4 km south-west of the Narrabri town centre, within agricultural land, and is generally bounded by:</p> <ul style="list-style-type: none"> ▶ Yarrie Lake Road to the west ▶ Narrabri to Walgett Line to the north ▶ Commercial/industrial facilities to the east ▶ Farmland to the south. <p>The Narrabri temporary workforce accommodation would also be located at this site.</p>
	LGA	Narromine	Gilgandra	Narrabri
Biodiversity	Threatened species and communities	<p>The native vegetation in and around the site may provide habitat for threatened fauna species such as the Grey-crowned babbler and Koala, which have been previously recorded in this area.</p> <p>No threatened flora species, (or suitable habitat) or threatened ecological communities have been recorded at the site.</p>	<p>Broad-ranging threatened species, such as the little eagle and spotted harrier, may forage over the site on occasion.</p> <p>No threatened flora (or suitable habitat) or threatened ecological communities have been recorded at the site.</p>	<p>The native vegetation in and around the site may provide habitat for threatened species such as the Grey-crowned babbler and broad-ranging threatened species such as the Little eagle and Spotted harrier.</p> <p>No threatened flora species or threatened ecological communities have been recorded at this site. Native vegetation (plant community type (PCT) 619) at the site provides suitable habitat for the threatened flora species, Winged peppercreep (<i>Lepidium monoplacoides</i>).</p>
	Native vegetation	<p>The site is mostly cleared for agricultural purposes. Areas of native vegetation within the site are limited and comprise about:</p> <ul style="list-style-type: none"> ▶ 2.2 ha of PCT 88 (Pilliga box - White cypress pine - Buloke shrubby woodland) ▶ 1.7 ha of PCT 49 (partly Windmill grass - Copperburr alluvial plains shrubby grassland) ▶ 1.2 ha of PCT 247 (Lignum shrubland wetland). 	<p>The site is entirely cleared for agricultural purposes and does not contain any native vegetation.</p>	<p>The site is mostly cleared for agricultural purposes. Areas of native vegetation within the site comprise about:</p> <ul style="list-style-type: none"> ▶ 86.7 ha of PCT 619 (Derived wire grass grassland) ▶ 5 ha of PCT 148 (Dirty gum - Buloke - White cypress pine— - Ironbark shrubby woodland).

Aspect		Narromine South	Curban	Narrabri West
Biodiversity (continued)	Aquatic ecology	<p>The sites do not contain any threatened aquatic ecological communities.</p> <p>There are a number of threatened species, endangered populations and aquatic matters of national environmental significance listed under the <i>Fisheries Management Act 1994</i> (NSW) (FM Act) and/or <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cth) (EPBC Act) that may occur within watercourses in the study area, including the Macquarie River, Namoi River and Narrabri Creek.</p>		
	Groundwater dependent ecosystems	There are no aquatic or terrestrial groundwater dependent ecosystems within or near any of the sites.		
	Protected and sensitive lands	There are no protected and sensitive lands within or near any of the sites.		
Water resources (hydrology and groundwater)	Watercourses and groundwater	<p>The site is located within the catchment of the Macquarie River.</p> <p>The nearest defined watercourse is Yellow Creek, located about 200 m to the south.</p> <p>Groundwater monitoring conducted near the site indicates that existing groundwater levels are greater than 30 m below ground level.</p>	<p>The site is located within the catchment of the Castlereagh River.</p> <p>The nearest defined watercourse is the Castlereagh River located about 3 m to the north-west.</p> <p>Groundwater monitoring conducted near the Castlereagh River indicates that existing groundwater levels are about 10 m below ground level.</p>	<p>The site is located within the catchment of the Narrabri Creek/Namoi River.</p> <p>The nearest defined watercourse is the Namoi River located about 900 m to the north-west.</p> <p>Groundwater monitoring conducted immediately adjacent to the Namoi River indicates that existing groundwater levels are about 5 m below ground level.</p>
Flooding	Flooding	The site is subject to flooding and is partially inundated in the 50% AEP flood event. Flooding mostly occurs in the western part of the site near the Parkes to Narromine Line.	The site is subject to flooding and is partially inundated in the 20% AEP flood event. Flooding mostly occurs in the southern part of the site.	The site is subject to flooding and is partially inundated in the 5% AEP flood event. Flooding mostly occurs in the western part of the site.
Soils and contamination	Soils	The site is located in the Terowie hydrogeological landscape dominated by colluvial soils. This landscape has a moderate likelihood of occurrence of salinity and a high likelihood of occurrence of sodicity. There is generally a low likelihood of encountering acid sulfate soils; however, these soils could be present close to the Macquarie River.	The site is located in the Mullengudgery hydrogeological landscape containing red and brown kandosols and chromosols on meander plains, brown and grey vertosols on back plains and brown vertosols in channels. This landscape has a moderate likelihood of occurrence of salinity and a high likelihood of occurrence of sodicity. There is generally a low likelihood of encountering acid sulfate soils; however, these soils could be present close to the Castlereagh River.	No hydrogeological landscape mapping is available for this site. Regional soil mapping indicates the area is dominated by solodic soils. There is generally a low likelihood of encountering acid sulfate soils; however, these soils could be present close to the Namoi River.
	Contamination	There are no registered contaminated sites near the multi-function compounds. There is the potential for soils to have been contaminated by existing and historical activities such as agriculture, illegal dumping, waste and industrial facilities, and road and rail infrastructure. Contaminants could include heavy metals, hydrocarbons, herbicides, pesticides, micro-biological organisms and asbestos.		

Aspect		Narromine South	Curban	Narrabri West
Water quality	Water quality	The Macquarie River catchment generally has poor water quality with elevated levels of electrical conductivity and nutrients, and low levels of dissolved oxygen, particularly during low flows.	The Castlereagh River catchment generally has poor water quality with elevated levels of electrical conductivity and nutrients, and low levels of dissolved oxygen, particularly during low flows.	The Namoi River catchment generally has poor water quality with elevated levels of electrical conductivity and nutrients, particularly during low flows.
Aboriginal heritage	AHIMS sites	No AHIMS sites are located within or near the sites.		
	Aboriginal heritage potential	The sites are located within areas that are mostly cleared and have been previously disturbed. No areas of cultural sensitivity have been identified within the sites; however, there is the potential to encounter unknown Aboriginal items.		
Non-Aboriginal heritage	Listed heritage items	There are no listed non-Aboriginal heritage items within or near the sites.		
	Identified potential heritage items	None known	The former Curban railway station and Masters cottage site is located about 1 km to the east of the site.	None known
Noise and vibration	Existing noise environment	The site is located within an agricultural landscape with low background noise levels. The main sources of noise would be rail, road and agricultural activities.	The site is located within an agricultural landscape with low background noise levels. The main sources of noise would be rail, road and agricultural activities.	The site is located on the outskirts of Narrabri with relatively low background noise levels. The main sources of noise would be rail, road and industrial and agricultural activities.
	Sensitive receivers	The site is located within noise catchment area (NCA) 6. There are a number of sensitive receivers around the site. The nearest sensitive receiver is about 120 m away.	The site is located within NCA 4. There are two sensitive receivers within 1 km of the site. The nearest sensitive receiver is about 720 m away.	The site is located within NCA 1. There are a number of sensitive receivers around the site. The nearest sensitive receiver is about 70 m away.
Air quality	Existing air quality	Regional air quality is generally good and mainly influenced by agricultural activities and road vehicle emissions.		
Traffic and transport	Nearest road	Tomingley Road	Bardens Road and Wyuna Road	Yarrie Lake Road
	Other features	The Parkes to Narromine Line is located on the western edge of the site.	The Dubbo to Coonamble Line is located on the northern edge of the site.	The Narrabri to Walgett Line is located on the northern edge of the site.
Land use and property	Land zoning	The site is zoned Primary Production (RU1) under the <i>Narromine Local Environmental Plan 2011</i> .	The site is zoned Primary Production (RU1) under the <i>Gilgandra Local Environmental Plan 2011</i> .	The site is zoned General Industrial (IN1) under the <i>Narrabri Local Environmental Plan 2012</i> .
	Existing land use	The site is used for agricultural activities and is comprised of existing cleared and disturbed land dominated by cropping.	The site is used for agricultural activities and is comprised of existing cleared and disturbed land dominated by cropping and introduced grassland.	The site is used for agricultural activities and is comprised of existing cleared and disturbed land, with patches of woodland, used primarily for grazing.

Aspect		Narromine South	Curban	Narrabri West
Land use and property (continued)	Surrounding features	<p>The site is located in an agricultural landscape with surrounding land use dominated by farmland. Key nearby features include:</p> <ul style="list-style-type: none"> ▶ The Parkes to Narromine Line located on the western edge of the site ▶ A grain storage and rail loading facility located on the western side of the Parkes to Narromine Line. 	<p>The site is located in an agricultural landscape with surrounding land use dominated by farmland. Key nearby features include:</p> <ul style="list-style-type: none"> ▶ The Dubbo to Coonamble Line located on the northern edge of the site ▶ A grain storage and rail loading facility located about 370 m to the south-east. 	<p>The site is located on the outskirts of Narrabri and, as such, surrounding land use includes a mix of large residential lots, farmland, industrial and commercial activities. Key nearby features include:</p> <ul style="list-style-type: none"> ▶ The Narrabri to Walgett Line located on the northern edge of the site ▶ The Narrabri landfill site is located to the west of the site ▶ A number of industrial and commercial facilities.
	Strategic agricultural land	The sites do not contain any critical industry clusters or biophysical strategic agricultural land.		
	Land and soil capability	The site has a land and soil capability class 4 (moderate capability land). This class has moderate-to-high limitations for land uses, such as cropping, high-intensity grazing and horticulture.	The site has a land and soil capability class 5 (moderate-to-low capability land). This class has high limitations for land uses such as cropping, high-intensity grazing and horticulture.	<p>Most of the site has a land and soil capability class 3 (high capability land). This class is capable of sustaining land uses such as cropping, high-intensity grazing and horticulture.</p> <p>The western portion of the site has a land and soil capability class 6 (low capability land). This class has very high limitations for land uses such as cropping, high-intensity grazing and horticulture.</p>
	Travelling stock reserves	None located within the site. One is located to the south-west of the site.	None located within or near the site.	None located within the site. A number are located to the east and north of the site.
Visual amenity	Landscape character and views	These sites are located in agricultural land within landscape character zone 1—slopes and plains. Landscape character and views are defined by farmland, forming a vast expanse of open, flat agricultural mosaic punctuated by scattered and linear trees.		<p>This site is located in agricultural land within landscape character zone 1—slopes and plains, and landscape character zone 5—township (alluvial plains).</p> <p>Landscape character and views are defined by open farmland against a backdrop of urban built form.</p>

C1.2.1 Environmental impact screening

An assessment has been carried out to compare the potential environmental impacts of the multi-function compounds relative to the potential environmental impacts of the proposal's key infrastructure (described in Part B).

Table C1.2 provides a summary of the environmental screening of the potential impacts of the multi-function compounds. The assessment identified the potential for impacts on biodiversity, flooding, noise and vibration (construction), traffic and transport, visual amenity and waste management. These potential impacts are considered in sections C1.2.2 to C1.2.7.

The potential impacts on the other environmental aspects are considered to be minor and/or consistent with those described in Part B and, therefore, have not been considered further in this chapter.

TABLE C1.2 ENVIRONMENTAL IMPACT SCREENING—MULTI-FUNCTION COMPOUNDS

Environmental aspects	Comments	Considered in Part C?	Where?
Biodiversity	The establishment and use of the multi-function compounds would require clearing of native vegetation and habitat for threatened species.	Yes	Section C1.2.2
Water resources (hydrology and groundwater)	<p>The sites are not located immediately near any defined watercourses and are unlikely to result in any significant change to local hydrological conditions. The potential hydrological impacts are expected to be consistent with those identified for the proposal's key infrastructure, as described in chapter B2. As such, they are not considered further in this chapter.</p> <p>Groundwater monitoring conducted for the proposal near the sites indicates existing groundwater levels are greater than 5 m below ground level. As only minor subsurface works would be required, the establishment and use of the multi-function compounds are not expected to intercept the water table. As such, they are not considered further in this chapter.</p>	No	Mitigation measures to be implemented are provided in chapter B2
Flooding	The sites are subject to flooding to varying degrees. The sites would be bunded to prevent inundation up to the 5% AEP flood event. The potential flooding impacts are expected to be consistent with those identified for the proposal's key infrastructure, as described in chapter B3. As such, they are not considered further in this chapter.	No	Mitigation measures to be implemented are provided in chapter B3
Soils and contamination	As only minor subsurface works would be required, the potential to encounter saline or sodic soils, acid sulfate soils and/or existing contamination would be low. If encountered, the potential impacts would be consistent with those identified for the proposal's key infrastructure, as described in chapter B4. As such, they are not considered further in this chapter.	No	Mitigation measures to be implemented are provided in chapter B4
Water quality	The establishment and use of the multi-function compounds would have the potential to affect surface water quality, mainly as a result of litter, sediments or nutrients being exported offsite, leading to downstream pollution of a watercourse. In addition, spills of oils or grease could pollute the nearby soil, groundwater or surface water. These potential impacts would be consistent with those identified for the proposal's key infrastructure, as described in chapter B5. As such, they are not considered further in this chapter.	No	Mitigation measures to be implemented are provided in chapter B5

Environmental aspects	Comments	Considered in Part C?	Where?
Aboriginal heritage	<p>No AHIMS sites or culturally sensitive areas have been identified within the sites.</p> <p>While the multi-function compounds would be located in areas that have been previously disturbed and cleared, there is potential to encounter unknown Aboriginal heritage items.</p> <p>If unknown Aboriginal heritage items are encountered, the impacts and mitigation measures would be consistent with those described in chapter B6. As such, they are not considered further in this chapter.</p>	No	Mitigation measures to be implemented are provided in chapter B6
Non-Aboriginal heritage	<p>There are no known non-Aboriginal heritage constraints associated with any of the sites.</p> <p>If unknown items are encountered, the impacts and mitigation measures would be consistent with those described in chapter B7. As such, they are not considered further in this chapter.</p>	No	Mitigation measures to be implemented are provided in chapter B7
Noise and vibration (construction)	<p>There are a number of sensitive receivers located in close proximity to the Narromine South and Narrabri West multi-function compounds. There are limited sensitive receivers near the Cuban multi-function compound. Sensitive receivers located near the multi-function compounds would potentially be impacted by construction noise.</p> <p>The potential vibration impacts during establishment and use of the multi-function compounds would be consistent with the impacts described in chapter B8. As such, they are not considered further in this chapter.</p>	Yes	Section C1.2.3
Air quality	<p>The establishment and use of the multi-function compounds would have the potential to impact on air quality for surrounding sensitive receivers.</p>	Yes	Section C1.2.4
Traffic and transport	<p>Road access to the multi-function compounds would be via the public road network. During establishment and use of the multi-function compounds, there would be increased heavy vehicle movements on the local road network.</p>	Yes	Section C1.2.5
Land use and property	<p>The establishment and use of the multi-function compounds would have the potential for impacts on land use and agricultural resources, and may directly impact on land capability, farm infrastructure and biosecurity.</p> <p>The multi-function compounds are temporary in nature and would be rehabilitated and returned to the existing land use following construction.</p> <p>The potential land use and property impacts would be consistent with the impacts described in chapter B12. As such, they are not considered further in this chapter.</p>	No	Mitigation measures to be implemented are provided in chapter B12
Visual amenity	<p>The establishment and use of the multi-function compounds would have the potential for temporary impacts on visual amenity.</p>	Yes	Section C1.2.6
Socio-economic	<p>The multi-function compounds would have the potential for temporary socio-economic impacts, including amenity impacts. These potential impacts would be consistent with the impacts described in chapter B14. As such, they are not considered further in this chapter.</p>	No	Mitigation measures to be implemented are provided in chapter B14
Cumulative impacts	<p>The potential cumulative impacts of the proposal as a whole are described in chapter D1. As such, they are not considered further in this chapter.</p>	No	Mitigation measures to be implemented are provided in chapter D1
Waste management	<p>The multi-function compounds would generate a range of waste streams requiring management.</p>	Yes	Section C1.2.7

Environmental aspects	Comments	Considered in Part C?	Where?
Sustainability	The establishment and use of the multi-function compounds would include consideration of sustainability measures. The sustainability assessment for the proposal as a whole is provided in chapter D3. As such, it is not considered further in this chapter.	No	Mitigation measures to be implemented are provided in chapter D3
Climate change	As the multi-function compounds would be temporary only, potential climate change impacts would be minimal and consistent with the impacts described in chapter D4. As such, they are not considered further in this chapter.	No	Mitigation measures to be implemented are provided in chapter D4

C1.2.2 Biodiversity

The assessment approach, existing environment, potential impacts and mitigation measures for the proposal are described in chapter B1 and Technical Report 1—Biodiversity development assessment report. The findings of this assessment for the establishment and use of the multi-function compounds are summarised in this section.

Establishment

Clearing of vegetation would be required at all multi-function compound sites. The impacts associated with clearing at the multi-function compound sites are summarised in Table C1.3. Detailed design and construction planning would seek to minimise the construction footprint and avoid impacts on native vegetation and hollow-bearing trees as far as practicable (see mitigation measures BD1 and BD2).

The biodiversity management plan (see mitigation measure BD7), which would be prepared and implemented as part of the CEMP, would detail measures to minimise the potential for biodiversity impacts during construction. The requirements for the biodiversity management plan are provided in the CEMP outline in Appendix I.

The overall loss of native vegetation, and potential impacts on threatened species, have been taken into account in the impact assessment and calculation of biodiversity offsets described in chapter B1. Biodiversity offsets for the proposal (see mitigation measure BD4) would address the impacts of the multi-function compounds.

TABLE C1.3 DIRECT IMPACTS ON VEGETATION AND HABITATS AT MULTI-FUNCTION COMPOUNDS

Multi-function compound	Vegetation removal	Threatened species and communities
Narromine South	About 5.1 ha of native vegetation would be removed. This would include: <ul style="list-style-type: none"> ▶ 2.2 ha of PCT 88 ▶ 1.7 ha of PCT 49 ▶ 1.2 ha of PCT 247. 	The native vegetation proposed to be removed would provide habitat for threatened species such as the Grey-crowned babbler and Koalas previously recorded at this location. Removal of this vegetation would further reduce habitat for these species and affect connectivity across the landscape. No threatened flora (or habitat) or threatened ecological communities would be impacted.
Curban	The site is entirely cleared for agricultural purposes and does not contain any native vegetation.	Removal of cropping and introduced grassland would have a negligible impact on threatened fauna species. Broad-ranging threatened species, such as the Little eagle and Spotted harrier, may forage over the site on occasion. No threatened flora (or habitat) or threatened ecological communities would be impacted.
Narrabri West	About 91.7 ha of native vegetation would be removed. This would include: <ul style="list-style-type: none"> ▶ 86.7 ha of PCT 619 ▶ 5 ha of PCT 148. 	The removal of grassland (PCT 619) would have limited impacts on threatened fauna species, such as the Little eagle and Spotted harrier, which may forage over the site on occasion. Clearing of native woodland (PCT 148) would remove habitat for threatened species such as the Grey-crowned babbler. No threatened ecological communities would be impacted. Grassland (PCT 619) at the site provides suitable habitat for the threatened flora species, Winged peppercreep (<i>Lepidium monoplacoides</i>). Removal would contribute to a potentially significant impact on this species from the proposal as a whole, as described in chapter B1.

Use

There would be no direct impacts on biodiversity during use of the multi-function compounds, as all clearing would be undertaken at the establishment stage. Other impacts associated with construction activities, such as vehicle strike and construction lighting, would potentially occur and are consistent with those described in chapter B1.

At the end of construction, all disturbed areas not required for the proposal's operational infrastructure would be rehabilitated. Finishing and rehabilitation would be undertaken progressively. Site rehabilitation would be carried out in accordance with the rehabilitation strategy (see section A8.7 and mitigation measure BD11).

Mitigation measures

The mitigation measures to address potential biodiversity impacts are provided in chapter B1. No specific mitigation measures are provided for the establishment and use of the multi-function compounds.

C1.2.3 Noise and vibration (construction)

The assessment approach, background noise levels, management levels/criteria, potential construction impacts and mitigation measures for the proposal are described in chapter B8 and Technical Report 8—Noise and vibration assessment—construction and other operations. The findings of the assessment for the establishment and use of the multi-function compounds are summarised in this section.

The establishment and use of the multi-function compounds would require the use of plant and equipment, which could generate high noise and vibration levels at nearby sensitive receivers. The potential impacts would vary depending on the intensity and location of the activities, the type of equipment used, existing background noise, intervening terrain, and prevailing weather conditions.

The predicted highest exceedance and number of exceedances of the construction noise management levels (see section B8.2.1) at sensitive receivers for the establishment and use of the multi-function compounds are provided in Table C1.4. The assessment has been based on a range of construction scenarios as follows:

- ▶ INFR01—pre-construction, multi-function compound establishment
- ▶ INFR02—pre-construction, rail and sleeper deliveries
- ▶ INFR07—multi-function compound use
- ▶ INFR08—Curban concrete precast yard
- ▶ INFR09—fixed batching plants.

All sensitive receiver locations are shown in the maps in Part E.

TABLE C1.4 SUMMARY OF PREDICTED NOISE EXCEEDANCES—MULTI-FUNCTION COMPOUNDS

Criteria	Multi-function compound	Construction noise management level DB(A)	INFR01 establishment	INFR02 deliveries	INFR09 batching plant	INFR08 Curban precast yard	INFR07 use
Residential receivers¹							
Highest exceedance (dB(A))							
Highly affected	Narromine South	75	0	0	0	0	0
	Curban	75	0	0	0	0	0
	Narrabri West	75	0	0	0	0	0
Primary proposal construction hours and out-of-hours work (all periods)	Narromine South	35	28	23	0	0	23
	Curban	35	14	9	8	9	9
	Narrabri West	35	34	29	14	0	29
Number of exceedances							
Highly affected	Narromine South	75	0	0	0	0	0
	Curban	75	0	0	0	0	0
	Narrabri West	75	0	0	0	0	0
Primary proposal construction hours and out-of-hours work (all periods)	Narromine South	35	11	8	0	0	8
	Curban	35	1	1	1	1	1
	Narrabri West	35	389	135	63	0	135
Non-residential receivers (when in use)							
Number of exceedances							
Childcare	All	52	0	0	0	0	0
Worship	All	52	0	0	0	0	0
Hospital / health	All	52	0	0	0	0	0
Educational	All	52	0	0	0	0	0
Community	All	52	0	0	0	0	0
Recreation, passive	All	60	0	0	0	0	0
Recreation, active	All	65	0	0	0	0	0
Commercial/industrial	Narromine South	70	1	1	0	0	1
	Curban		0	0	0	0	0
	Narrabri West		5	1	0	0	1

Note: 1. The Narromine South and Narrabri West temporary workforce accommodation facilities are not included in this table and have been assessed separately.

Establishment

As shown in Table C1.4, during establishment of the multi-function compounds, exceedances of the construction noise management level are predicted at a number of sensitive receivers, as follows:

- ▶ Narromine South—at up to 11 residential receivers and 1 non-residential receiver. The highest level of exceedance predicted is up to 28 dB(A). There would also be the potential for impacts on the Narromine South temporary workforce accommodation.
- ▶ Curban—at up to one residential receiver and no non-residential receivers. The highest level of exceedance predicted is up to 14 dB(A).
- ▶ Narrabri West—at up to 389 residential receivers and 5 non-residential (commercial/industrial) receivers. The highest level of exceedance predicted is up to 34 dB(A). There would also be the potential for impacts on the Narrabri West temporary workforce accommodation.

No exceedances of the highly affected noise level of 75 dB(A) are predicted.

The potentially affected receivers are shown in Figure C1.1, Figure C1.2 and Figure C1.3. These potential impacts would be managed in accordance with a construction noise and vibration management plan (see mitigation measure CNV3), which would be prepared as part of the CEMP. The requirements for the noise and vibration management plan are provided in the CEMP outline in Appendix I. Potential impacts on the Narromine South and Narrabri West temporary workforce accommodation facilities would also be managed in accordance with the temporary workforce accommodation plan (see mitigation measure SE-C12).

Use

As shown in Table C1.4, during use of the multi-function compounds, exceedances of the construction noise management level are predicted at a number of sensitive receivers as follows:

- ▶ Narromine South—at up to eight residential receivers and one non-residential receiver. The highest level of exceedance predicted is up to 23 dB(A). There would also be the potential for impacts on the Narromine South temporary workforce accommodation.
- ▶ Curban—at up to one residential receiver and no non-residential receivers. The highest level of exceedance predicted is up to 9 dB(A).
- ▶ Narrabri West—at up to 135 residential receivers and one non-residential receiver. The highest level of exceedance predicted is up to 29 dB(A). There would also be the potential for impacts on the Narrabri West temporary workforce accommodation.

No exceedances of the highly affected noise level of 75 dB(A) are predicted due to use of the concrete batching plant.

The potentially affected receivers are shown in Figure C1.1, Figure C1.2 and Figure C1.3. These potential impacts would be managed in accordance with a construction noise and vibration management plan (see mitigation measure CNV3). Potential impacts on the Narromine South and Narrabri West temporary workforce accommodation facilities would also be managed in accordance with the temporary workforce accommodation plan (see mitigation measure SE-C12).

Mitigation measures

Where exceedances at sensitive receivers are predicted, the mitigation measures provided in chapter B8 would be implemented to minimise potential construction noise impacts as far as reasonably practicable. No specific mitigation measures are provided for the establishment and use of the multi-function compounds.

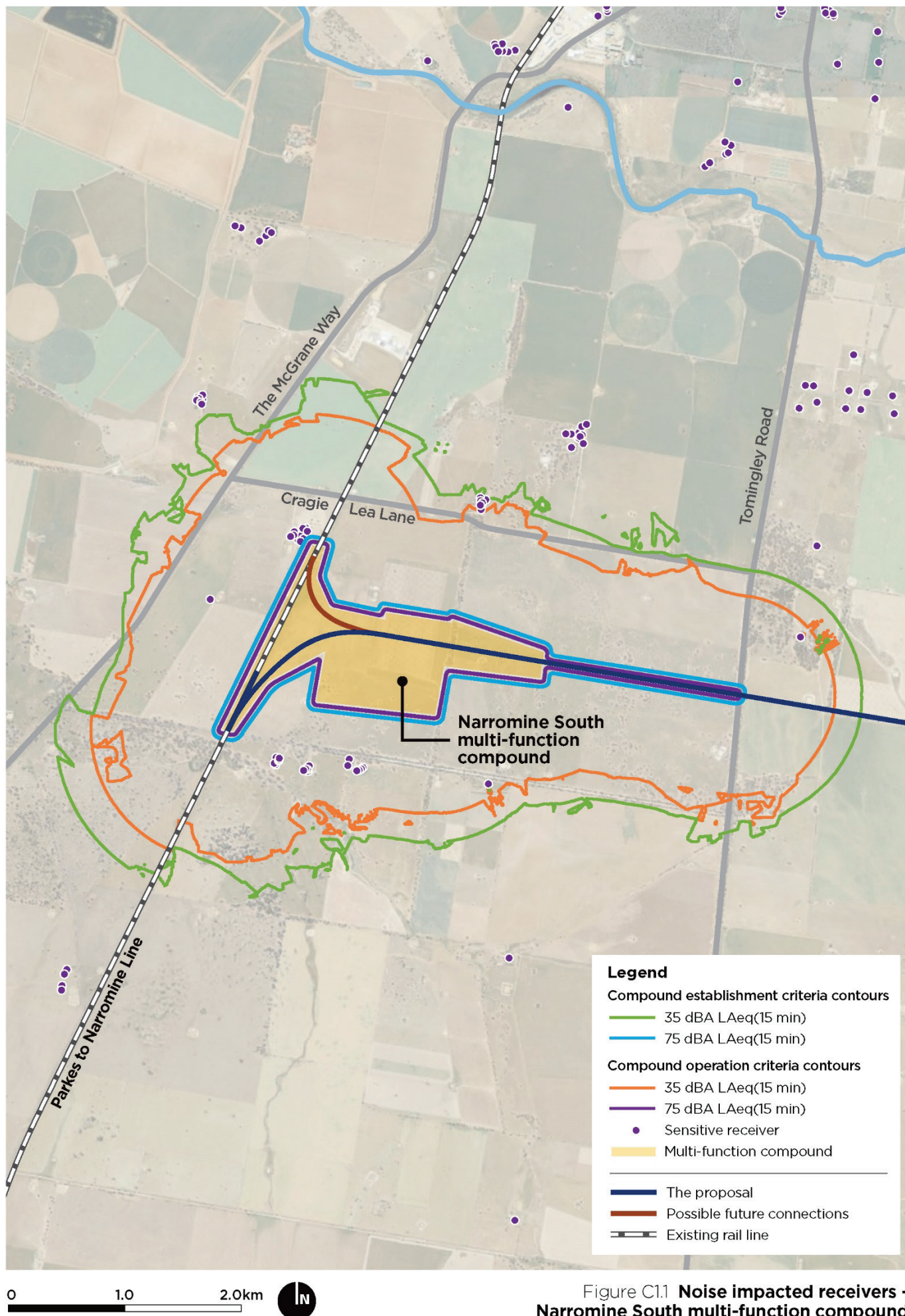


Figure C1.1 Noise impacted receivers - Narromine South multi-function compound

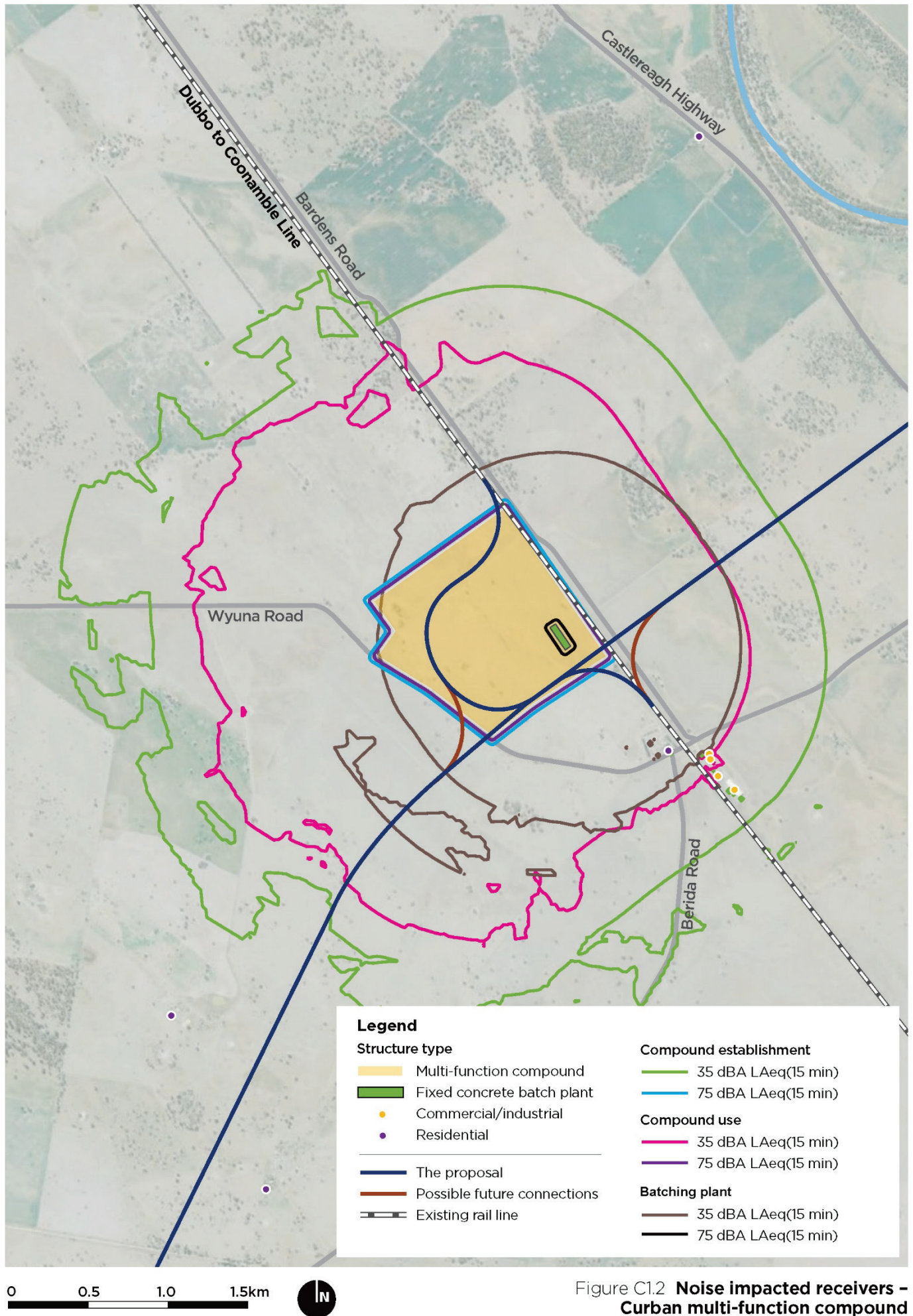


Figure C1.2 Noise impacted receivers – Curban multi-function compound

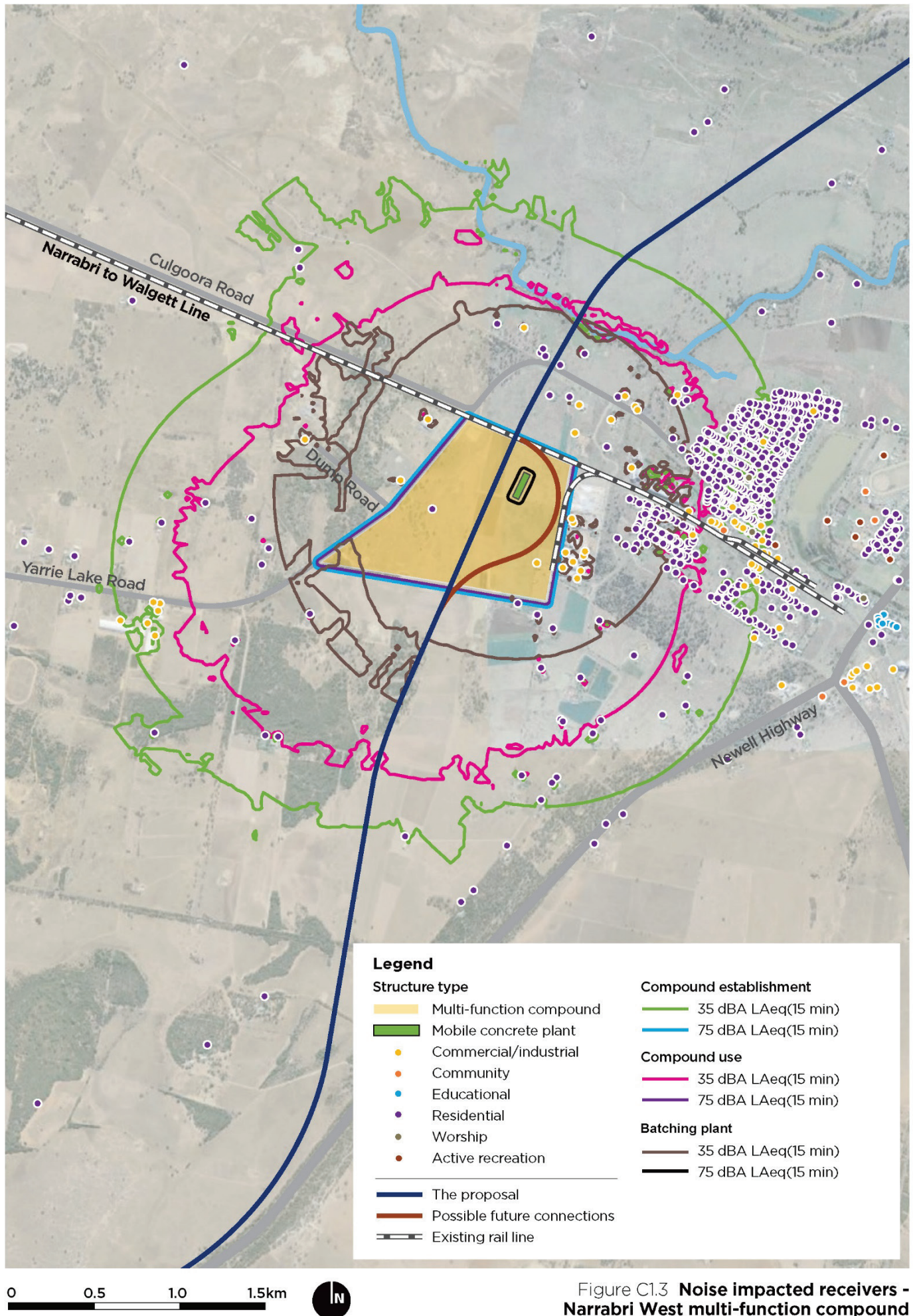


Figure C1.3 Noise impacted receivers - Narrabri West multi-function compound

C1.2.4 Air quality

The assessment approach, background air quality, management levels/criteria, potential impacts and mitigation measures for the proposal are described in chapter B10. The findings of this assessment for the establishment and use of the multi-function compounds are summarised in this section.

A screening level assessment has been undertaken with consideration of the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (NSW EPA, 2016) (the Approved Methods). An emissions inventory for potential particulate sources was derived for the proposal and is provided in Appendix M. Table C1.5 summarises the estimated total dust emissions from establishment and use of multi-function compounds.

TABLE C1.5 ESTIMATED EMISSIONS DURING CONSTRUCTION—MULTI-FUNCTION COMPOUNDS

Proposal component— source of emission	Assumed dimensions for the purposes of the assessment	Total emissions of PM ₁₀	Total emissions of PM _{2.5}	Separation distance
Establishment and general use	250 x 250 m (indicative)	0.00000951 grams per square metre per second	0.00000095 grams per square metre per second	140 m
Use of concrete batching plants	200 m ³ per hour	1.5 grams per second	0.15 grams per second	375 m

The predicted worst-case 24-hour PM₁₀ and PM_{2.5} concentrations are presented in Appendix M as a concentration versus distance graph for the establishment and use of the multi-function compounds.

The number of potentially impacted receivers are provided in Table C1.6.

TABLE C1.6 SUMMARY OF AIR QUALITY IMPACTED RECEIVERS—MULTI-FUNCTION COMPOUNDS

Construction activity	Multi-function compound	Number of potentially impacted receivers
Establishment and general use of multi-function compounds	Narromine South	2
	Curban	0
	Narrabri West	3
Use of concrete batching plants at multi-function compounds	Narromine South	0
	Curban	0
	Narrabri West	0

Establishment

During the establishment of the multi-function compounds, air quality issues may arise from increases in dust emissions associated with vegetation clearing and disturbance of soils and emissions (exhaust fumes) from plant and equipment.

As shown in Table C1.6, during the establishment of the multi-function compounds, exceedances of the relevant air quality criteria are predicted at sensitive receivers, as follows:

- ▶ Narromine South—at up to two sensitive receivers (including the Narromine South temporary workforce accommodation)
- ▶ Curban—no exceedances predicted
- ▶ Narrabri West—at up to three sensitive receivers (including the Narrabri West temporary workforce accommodation).

The potentially affected receivers are shown in Figure C1.4 and Figure C1.5. These potential impacts would be managed in accordance with an air quality management plan (see mitigation measure AQ1), which would be prepared as part of the CEMP. The requirements for the air quality management plan are provided in the CEMP outline in Appendix I.

Use

During use of the multi-function compounds, air quality issues may arise from increases in dust emissions associated with site activities, emissions (exhaust fumes) from plant and equipment, and use of concrete batching plants.

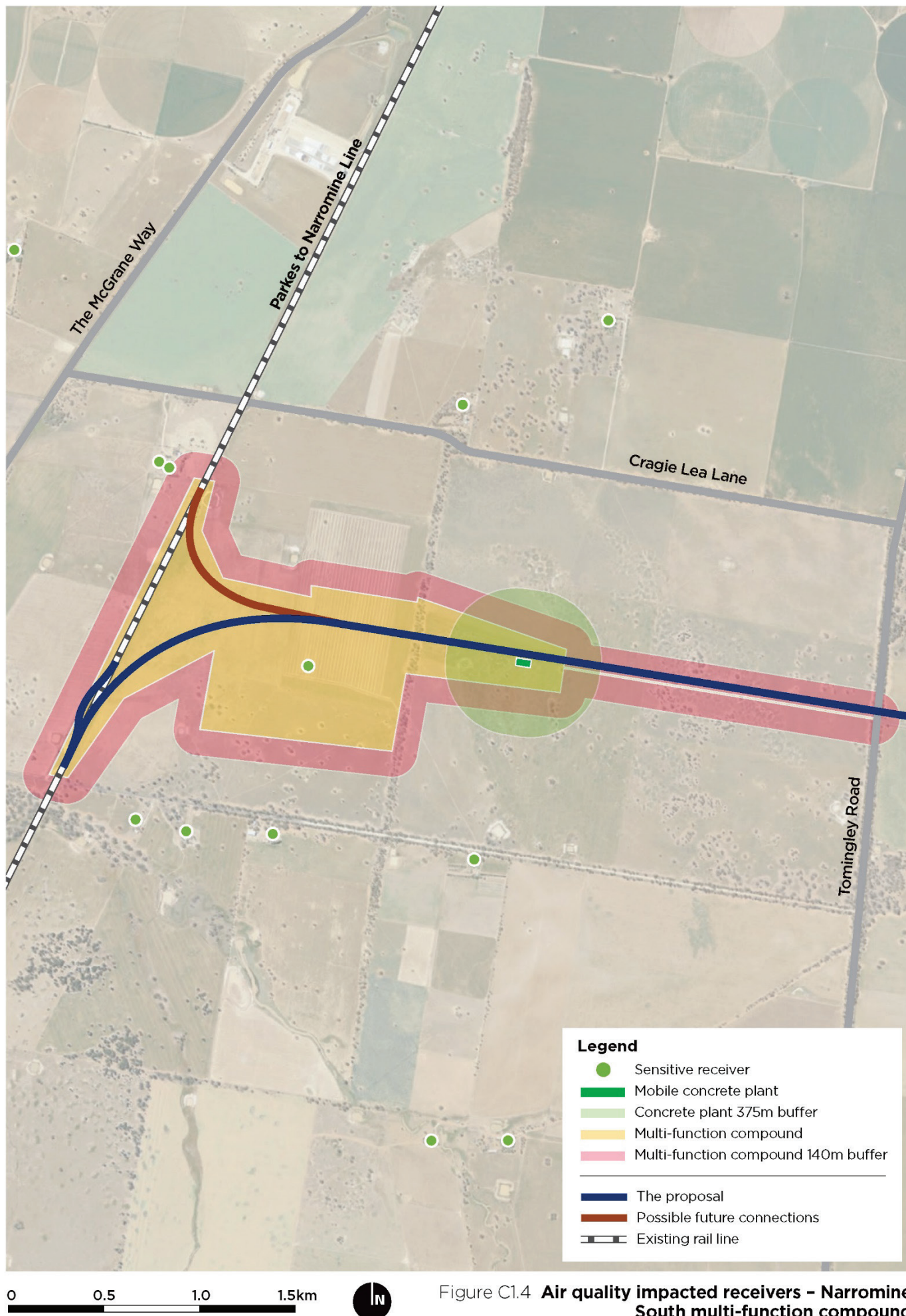
As shown in Table C1.6, during the use of the multi-function compounds, exceedances of the relevant air quality criteria levels are predicted at sensitive receivers as follows:

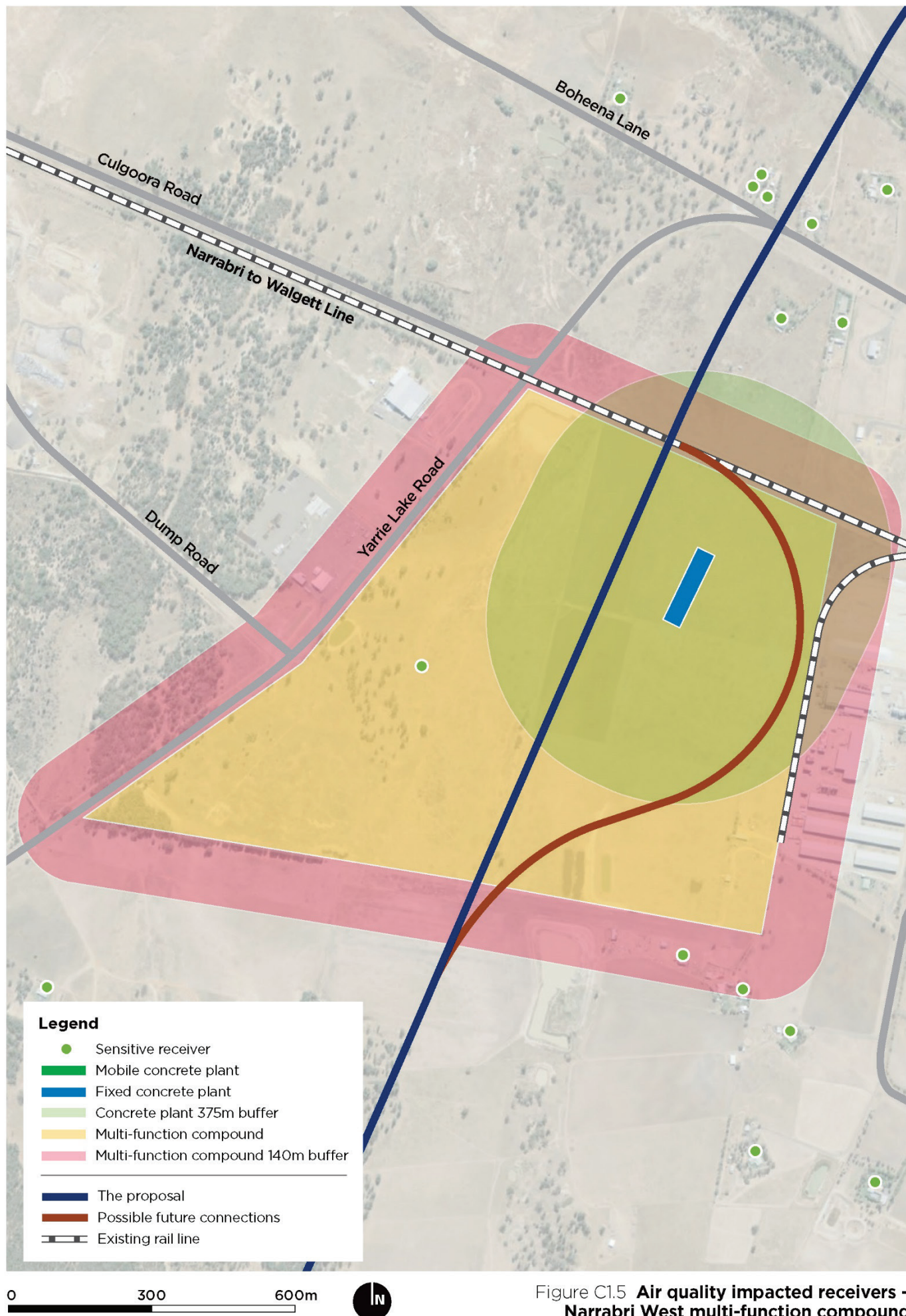
- ▶ Narromine South—at up to two sensitive receivers during general compound use (including the Narromine South temporary workforce accommodation) and at no sensitive receivers during concrete batching
- ▶ Curban—no exceedances predicted
- ▶ Narrabri West—at up to three sensitive receivers during general compound use. Subject to final design and layout, the Narrabri West temporary workforce accommodation may be partially affected during concrete batching.

The potentially affected receivers are shown in Figure C1.4 and Figure C1.5. These potential impacts would be managed in accordance with an air quality management plan (see mitigation measure AQ1).

Mitigation measures

Where receivers are identified within the separation distance, the mitigation measures provided in chapter B10 would be implemented to minimise potential air quality impacts. No specific mitigation measures are provided for the establishment and use of the multi-function compounds.





C1.2.5 Traffic and transport

The assessment approach, existing environment, potential impacts and mitigation measures for the proposal are described in chapter B11 and Technical Report 10—Traffic and transport assessment. The findings of this assessment for the establishment and use of the multi-function compounds are summarised in this section.

Establishment

The establishment of multi-function compounds would have minimal impacts on traffic and access, as most of the activities would be carried out within the site.

Estimated construction traffic movements associated with construction of the proposal as a whole (including establishment of the multi-function compounds) are provided in Technical Report 10 and summarised in chapter B11. The assessment identified that there is unlikely to be any significant impacts on the existing road network. As such, the movements associated with establishment of the multi-function compounds are not expected to impact the existing road network.

Use

As part of the pre-construction activities for the proposal, it is proposed that the rail and sleepers would be delivered to the multi-function compounds by trains using the existing rail network. This would be subject to availability of train paths and would not be expected to impact existing train operations. This early delivery would help to minimise traffic impacts on the road network.

Access to each multi-function compound would be provided as follows:

- ▶ Narromine South—a new temporary access road would be constructed off Tomingley Road
- ▶ Curban—access to the site would be provided off Wyuna Road
- ▶ Narrabri West—access to the site would be provided off Yarrie Lake Road.

The design of site access points would be undertaken with regard to relevant standards and guidelines and in consultation with the road manager (i.e. council or Transport for NSW).

Estimated construction traffic movements associated with construction activities for the proposal as a whole (including use of the multi-function compounds) are provided in chapter B11 and in Technical Report 10. The assessment identified that there is unlikely to be any significant impacts on the existing road network. As such, the movements associated with use of the multi-function compounds are not expected to significantly impact the existing road network.

Potential traffic impacts would be managed in accordance with a traffic, transport and access management plan (see mitigation measure TT6), which would be prepared and implemented as part of the CEMP. The requirements for the traffic, transport and access management plan are provided in the CEMP outline in Appendix I.

To minimise construction traffic movements on public roads, temporary construction haul roads would be constructed within the construction footprint. The haul roads would be used to transport materials and people to work areas and compounds. Deliveries and other movements to and from the multi-function compounds would be via the surrounding existing road network.

Mitigation measures

The mitigation measures to address potential traffic and transport impacts are provided in chapter B11. No specific mitigation measures are provided for the establishment and use of the multi-function compounds.

C1.2.6 Visual amenity

The assessment approach, existing environment, potential impacts and mitigation measures for the proposal are described in chapter B13 and Technical Report 12—Landscape and visual assessment. The findings of this assessment for the establishment and use of the multi-function compounds are summarised in this section.

Establishment

During establishment of the multi-function compounds, there would be the potential for impacts on visual amenity from the clearing of vegetation and other activities associated with the change in land use. These impacts would be similar to those described below for use.

Use

The Narromine South and Curban multi-function compounds would be located in an open agricultural landscape where the temporary change in land use would be noticeable. The Narrabri West multi-function compound would be located on the outskirts of Narrabri in a mixed agricultural and commercial/industrial setting where the temporary change would be less noticeable.

During use of the multi-function compounds, there would be potential impacts on visual amenity from use of plant and equipment, heavy vehicle movements (within and around the sites), lighting and other activities at the site. The main potential for visual impacts would be for residences located near the multi-function compounds.

The Narromine South multi-function compound would be potentially visible from surrounding residences and local roads such as Tomingley Road, Craigie Lea Lane and Narwonah Siding Road. A viewpoint analysis undertaken in this vicinity (viewpoint 1) identified that, during construction, the overall visual impact would be moderate. Construction activity and the compound would be discernible changes in the existing view, although this would occur behind some existing foreground vegetation.

The Cuban multi-function compound would be potentially visible from surrounding residences and local roads such as Wyuna Road. The Narrabri West multi-function compound would be potentially visible from surrounding residences and industrial/commercial facilities and local roads such as Yarrie Lake Road.

In accordance with mitigation measure LV5, compounds would be located away from sensitive landscape receptors, where practicable, and would be designed and orientated to minimise visual impacts.

The multi-function compounds would be one of the main sources of light during night-time work. The potential impacts of lighting are not expected to be significant, as night-time work would be minimal. In addition, light generated during construction would be designed to comply with *Australian Standard AS 4282-1997 Control of the Obtrusive Effects of Outdoor Lighting* (Standards Australia, 1997), and consider the good lighting design principles documented in the *Dark Sky Planning Guideline: Protecting the observing conditions at Siding Spring* (Department of Planning and Environment, 2016) [see mitigation measure LV4 and LV8]. As a result, lighting at the multi-function compounds is not expected to impact surrounding residences or the Dark Sky Region centred on the Siding Spring Observatory.

The multi-function compounds are temporary in nature and would be rehabilitated and returned to their previous land use following construction. Site rehabilitation would be carried out in accordance with the rehabilitation strategy (see section A8.7 and mitigation measure BD12). The impacts on landscape character and visual amenity would be temporary with no major change to the overall landscape character predicted.

Mitigation measures

The mitigation measures to address potential impacts on landscape character and visual amenity are provided in chapter B13. No specific mitigation measures are provided for the establishment and use of the multi-function compounds.

C1.2.7 Waste management

The assessment approach, potential impacts and mitigation measures for the proposal as a whole are described in chapter D2. The findings of this assessment for the establishment and use of the multi-function compounds are summarised in this section.

Estimated waste quantities and classifications for the proposal as a whole are provided in chapter D2. These would be confirmed during detailed design and construction planning and incorporated into the construction waste management plan (see mitigation measure WM3), which would be prepared and implemented as part of the CEMP.

Establishment

Establishment of multi-function compounds would generate a range of waste streams, including green waste from clearing of vegetation, spoil, potentially contaminated soils (including asbestos containing materials) and waste metal/timber posts from fencing.

Potential impacts and the proposed approach to waste management would be similar to those described below for use.

Use

The use of multi-function compounds would generate a range of waste streams, including food and organic waste, wastewater, waste paper and cardboard, waste containers (plastics, glass and metals), other office waste, electrical and electronic waste, waste from vehicle/plant equipment maintenance (adhesives, lubricants, waste fuels and oils, engine coolant, batteries, hoses and tyres), concrete and concrete washout waste.

Inappropriate management of waste could result in a range of impacts on air quality, water quality and soils. The proposed approach to classification and management of waste streams, in accordance with the *Waste Classification Guidelines* (NSW EPA, 2014a) and waste management hierarchy (avoid, reduce, recycle, reuse, dispose), including measures to facilitate segregation and prevent cross contamination, is described in chapter D2.

Waste that would be taken offsite would be stored temporarily at compounds before being transferred for recycling and disposal at licensed waste management facilities. Waste segregation bins (colour coded) would be located at compounds, to facilitate segregation and prevent cross contamination.

The construction waste management plan (see mitigation measure WM3), which would be prepared and implemented as part of the CEMP, would detail measures to manage potential waste impacts during construction. The requirements for the waste management plan are provided in the CEMP outline in Appendix I.

Mitigation measures

The mitigation measures to address potential impacts are provided in chapter D2. No specific mitigation measures are provided for the establishment and use of the multi-function compounds.

C1.3 Specific mitigation measures

No specific mitigation measures are provided for the establishment and use of the multi-function compounds. The mitigation measures provided for the proposal, compiled in chapter D5, would be applied as relevant to the multi-function compounds.