Chapter 20

Utilities and services

20 Utilities and services

20.1 Introduction

This chapter summarises the existing utilities and services on site, any impact the proposal will have on these utilities and services and the proposed servicing strategy for the proposal. While utility and services connections are discussed within this chapter, any works related to utilities and services outside the proposal site are discussed in **Chapter 22 Related development**.

A Utilities and Services Assessment Report **(Technical Report P)** was prepared to outline the impacts of the proposal on existing public utilities within the proposal boundary and describes the proposed servicing strategy for the proposal.

The methodology for the utilities and services assessment involved:

- Identifying the existing utilities and services within the proposal site, by conducting a Dial-Before-You-Dig (DBYD) search, and acquiring other sources of record information and comparing these against the proposed site layout
- Assessing the additional demand that the proposal is placing on the capacity of existing utilities and services infrastructure during construction and operation
- Consulting with all relevant utility and service suppliers
- Defining a preferred point of connection for each service to the proposal site
- Developing mitigation measures.

20.2 Existing environment

Figure 20.1 shows the existing utilities and services near the proposal site.

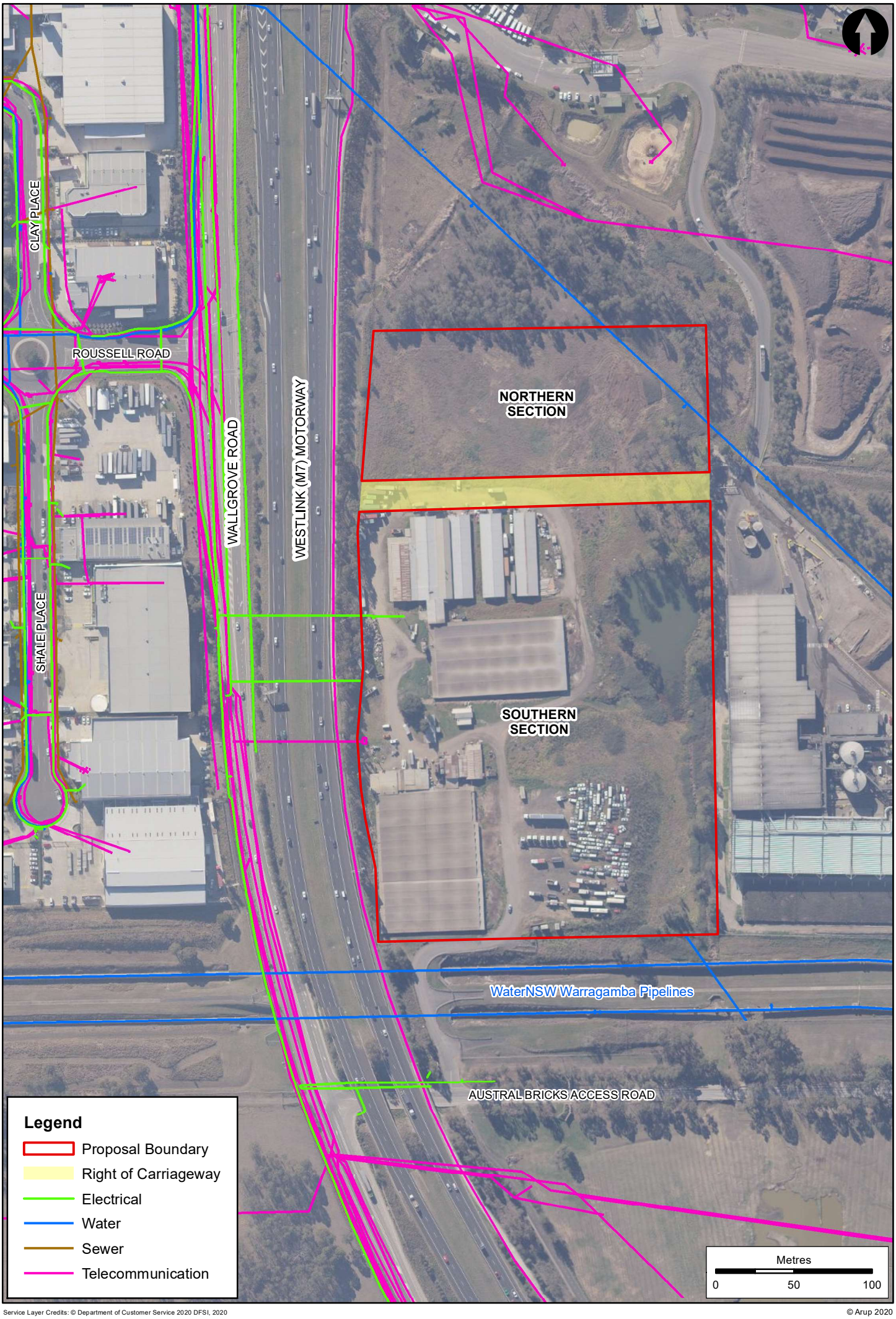

Figure 20.1: Existing utilities and services

20.2.1 Electrical

Endeavour Energy owns several electrical assets located within and close to the proposal site. These include a 33kV overhead transmission line that runs north-south along Wallgrove Road, and three lines which branch off this main to the east, towards the proposal site, as shown in **Figure 20.2**.

The three lines which branch off the 33kV main include:

- A northern branch with four conduits, located to the west of the site, that crosses underneath Wallgrove Road and the Westlink M7 motorway (the M7). This branch supplies power to the existing buildings on site.
- A middle branch with 3 x 250mm conduits which are vacant, located to the west of the site, that also crosses underneath Wallgrove Road and the M7. This connects to a pad mount substation on the western corner of the access road to the proposal site.
- A southern branch, located to the south of the site, that also crosses underneath the M7.

The site's electricity is currently supplied by the Endeavour Energy high-voltage network, from a nearby 11kV feeder located on the western verge of Wallgrove Road, west of the proposal boundary. The electrical cables that supply the site are contained in conduits from the northern branch (described above) and are buried under Wallgrove Road and the M7. The cables enter the site below ground, at the western boundary, and reach an existing underground to overhead (UGOH) pole. Within the site, existing sheds and outhouses are served from a privately owned overhead electrical network that connects to the main feeder.

Figure 20.2: Existing electrical assets

20.2.2 Water supply

20.2.2.1 WaterNSW assets

The Warragamba Pipeline corridor is located immediately south of the proposal site, running parallel to the southern boundary. The pipeline corridor is about 50m wide and contains two large above-ground steel cement lined, internal bitumen lined (SCL) (IBL) pipelines – 2.1m diameter for the southern pipe and 3.0m diameter for the northern pipe. These are known as the Warragamba Pipelines, and they are owned and managed by WaterNSW. The pipelines run roughly east-west in alignment.

20.2.2.2 Sydney Water assets

Sydney Water owns an existing 1050mm diameter SCL IBL water main located under the northern portion of the site running north-west to south-east, as shown in **Figure 20.3**. Beyond the proposal site, the water main continues south east and then follows the Warragamba Pipelines corridor east.

20.2.2.3 Site water connection

A 50mm diameter water connection from the WaterNSW 2.1m diameter southern pipeline of the Warragamba Pipelines enters the site at the southeast corner of the proposal site. This connection was used previously as a back-up water supply for the poultry operations, in addition to the farm dam.

20.2.3 Sewer

The site is not currently connected to sewer services. Previous activities on the site used septic tanks from which sewage was pumped out periodically and transported off site for treatment/disposal.

There are Sydney Water sewer assets located to the west of the proposal site, as shown in **Figure 20.4** The nearest existing sewer connection point is a 225mm diameter vitrified clay (VC) sewer at the intersection of Clay Place and Roussell Road, west of the proposal site.

20.2.4 Telecommunications

Record information shows there is a Telstra telecommunications connection from Wallgrove Road, under the M7, that terminates in a Telstra pit near the western boundary of the proposal site. It is understood that that this connection shown in **Figure 20.5** has been stopped and is no longer active.

AARNet, NBN, Nextgen, Optus, Superloop, and Uecomm have cable assets located under the eastern side of Wallgrove Road. PIPE Networks (TPG) has cable duct assets located adjacent to the M7 Cycleway. Based on available record information, there is no current telecommunications service to the existing site.

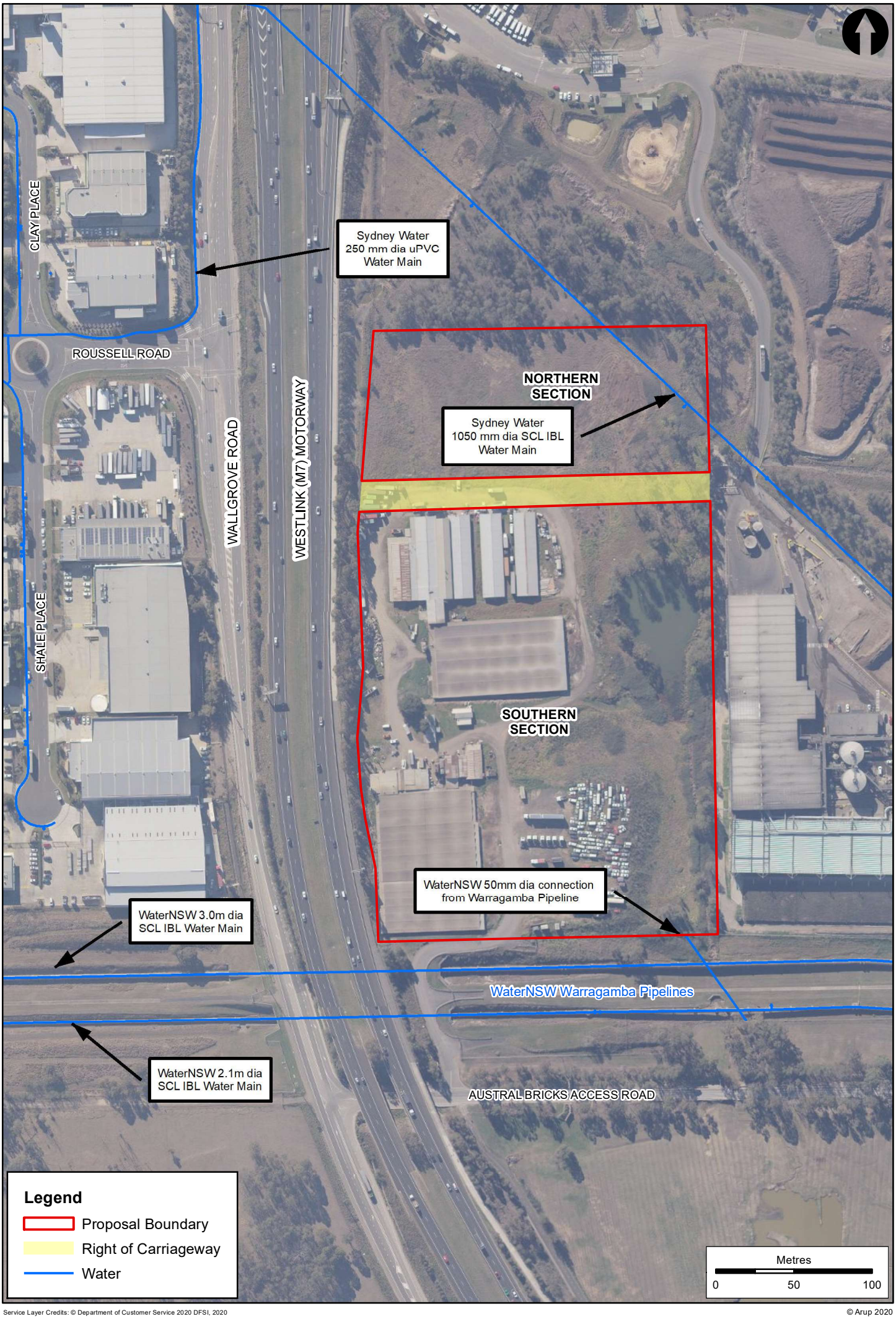

Figure 20.3: Existing water assets

Figure 20.4: Existing sewer assets

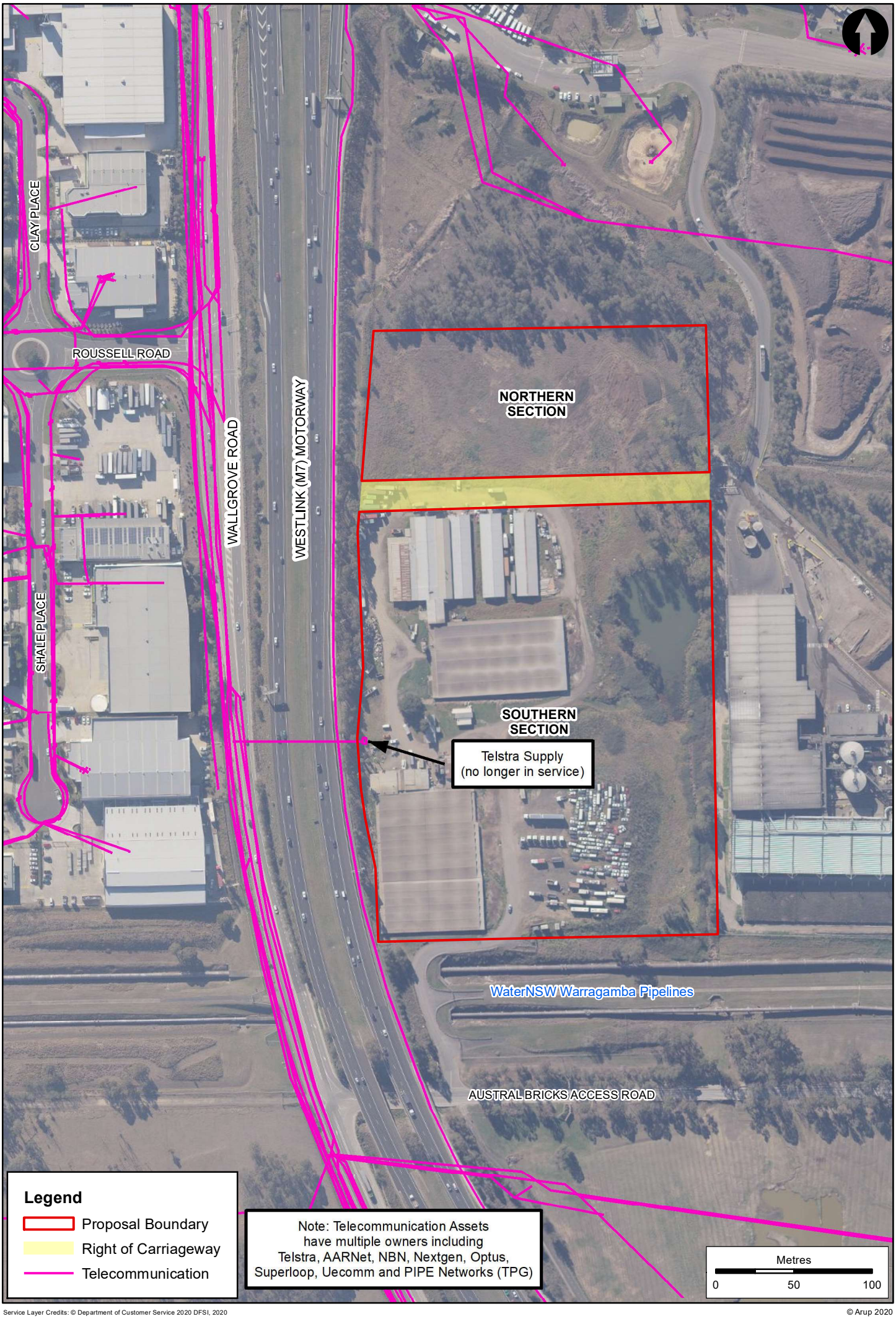

Figure 20.5: Existing telecommunication assets

20.2.5 Gas

There are no existing gas services near or within the proposal site and no connection is necessary for the proposal.

20.3 Assessment

This section describes the construction and operational impacts on utilities and services resulting from the proposal. The proposal requires offsite works to connect the site to electrical, water, sewer and telecommunications services. These offsite works and any potential associated impacts do not form part of the scope of the proposal and are described in **Chapter 22 Related development**.

20.3.1 Construction impacts

Before the start of demolition works, private networks (internal electrical and water) serving the existing buildings on site will be disconnected, to avoid impacts to the existing networks. The timing and location of utilities and services to be disconnected will be confirmed during detailed design, following further consultation with utility and service suppliers.

To minimise the need for diesel generators and water tanks onsite during construction, the applicant intends to use existing electrical and water services already connected to the proposal site. New temporary septic tanks or wastewater treatment plants, serving the construction compounds, will be used until a permanent connection is established. New temporary conduits and pipework will need to be installed inside the proposal boundary, to direct electricity and water to the temporary compound areas which are subject to discussion and agreement with network operators.

20.3.1.1 Electrical

The existing Endeavour Energy electrical supply is proposed to be retained to supply power for demolition and construction activities until the permanent electrical supply is installed and operational.

The underground to overhead (UGOH) pole that supports the existing electrical supply to the site is located next to the existing poultry shed building and between the two main buildings on the site.

The pole will be disconnected and removed to enable construction of the main EfW facility. The electrical cables will be diverted, before the pole is removed, and re-routed to the temporary construction compound.

Connections associated with the permanent electricity supply for the proposal site will require offsite works which are discussed in **Chapter 22 Related development.**

20.3.1.2 Water supply

Sydney Water assets

There are no existing Sydney Water assets within the southern portion of the proposal site where the construction is proposed. Minimal construction works or changes in level are proposed in the northern portion of the site where the existing Sydney Water water main is located. The proposed works, currently expected to be undertaken where the water main is located, relate to exotic vegetation clearing and replanting. So, the proposal is likely to cause no impact to the existing Sydney Water assets within the proposal boundary.

A new connection to Sydney Water's water infrastructure for potable water supply will involve disruption of existing infrastructure which is live and in use. Community engagement will be conducted as appropriate to keep the community informed of works and potential service/supply disruptions which may impact them.

The proposed connection to the existing Sydney Water main under Wallgrove Road, outside of the proposal boundary, is covered within **Chapter 22 Related development**.

WaterNSW assets

Water supply connection

The existing water supply connection from the Warragamba Pipelines is proposed to be retained during construction to service construction demands. Once the permanent potable water connection to the Sydney Water infrastructure is operational, the existing 50mm diameter pipe connected to the Warragamba Pipelines will be disconnected and removed. Disconnection details will be confirmed during detailed design, following agreement with WaterNSW.

Risk to Warragamba Pipelines

A Warragamba pipelines risk assessment has been completed for the proposal, detailing the risks that the proposal poses to the Warragamba Pipelines and the mitigation and monitoring measures proposed to address these items. A summary of this risk assessment is discussed below. The Warragamba Pipeline Risk Assessment is included as Appendix A of **Technical report P Utilities and Services Assessment**. The proposal will be designed, constructed and operated so that the Guidelines for Development Adjacent to the Upper Canal and Warragamba Pipelines are adhered to.

During the construction of the EfW facility, the equipment to be used near the pipeline will be chosen carefully to avoid vibration impacts. Vibration impacts to the Warragamba Pipeline will be avoided by carrying out a Construction Noise and Vibration Management Plan (CNVMP), which includes a construction vibration monitoring program. The purpose of the monitoring program is to avoid vibration over set criteria. Trigger thresholds would be established which, when exceeded would result in the cessation of any work. Work, potentially implementing alternative construction methods, would only ensue again once there was confidence that vibration impacts could be avoided. Further detail is available in **Technical report I Noise and Vibration Impact Assessment**.

The proposed high-voltage cables will be buried underground, in line with Service and Installation Rules of NSW and Endeavour Energy requirements. The cable routes will be positioned at a minimum of 20m from the pipeline corridor to reduce the risk of earth potential rise, and step and touch potentials on the metallic structures in the Pipelines Corridor, and to reduce corrosion potential of the Warragamba Pipelines by low-frequency induction from the generation of electricity by the EfW facility.

Any impacts from accidental spills or discharge of chemicals or hydrocarbons, such as fuels and oils in vehicles and/or equipment, will be managed by a spill management plan.

Erosion of soil and sedimentation through stormwater runoff and as result of earthworks and potential vegetation removal, will be managed through erosion and sediment control measures, to avoid any potential impact to the Warragamba Pipelines.

WaterNSW has access over to the pipeline corridor via two access tracks off the existing access road. The Warragamba Pipeline – Technical Paper and Risk Assessment outlines the proposed site access construction works. The works will be staged, to allow access from at least one of the access ramps to the Warragamba pipelines and pipelines corridor at all times. WaterNSW will be consulted before any works proceeding, and dates for construction will need to be agreed. Further detail will be developed during design development to work out and agree an approvals route. The proposed site access construction works do not form part of this proposal and are considered related development. This is discussed in more detail in **Chapter 22 Related development** and are subject to final detailed design.

20.3.1.3 Sewer

There are no existing Sydney Water sewer assets within the proposal site, so there will be no impacts to Sydney Water sewer infrastructure during construction.

To service the proposal, a new sewer pump station (located on the proposal site) is necessary to convey flows from the site to the existing Sydney Water sewer pipe at the intersection of Clay Place and Russell Road. The exact route of the new sewer main from the onsite pump station to this connection point is to be confirmed at detailed design stage. However, the preferred route crosses underneath the M7. To avoid open-cut trenching of the M7, which would cause significant disruption, this crossing will either use existing spare ducts, or a new crossing will be created by thrust boring. The proposed connection to the existing Sydney Water sewer outside of the proposal site is addressed in **Chapter 22 Related development**. These works will be carried out during earlier stages of construction, such that the permanent system can service both the construction and operation phases of the proposal.

20.3.1.4 Telecommunications

The existing Telstra pit and conduits on site will be removed to enable the construction of the proposal. A new separate telecommunication connection would be installed based on the design prepared by NBN.

A Fibre to the Premises (FTTP) connection by NBN will be built during construction and is proposed to supply a hard-wired service connection to the site during construction and operation as a permanent solution. NBN has confirmed that it will be able to coordinate and support the construction of additional infrastructure to connect to the existing NBN network on Wallgrove Road to the south of the site. The works proposed are not likely to impact on any of the existing telecommunication cables located outside the proposal site, currently located under Wallgrove Road or the M7.

20.3.2 Operation impacts

The WSERRC would be operational most of the year, except for planned shutdowns, to complete annual inspections and maintenance tasks. This includes annual inspections of core electrical, water and sewer systems on site.

The operation impacts, such as the demand which the proposal will place on utility networks, and whether there is enough capacity in the existing network, are assessed below.

20.3.2.1 Electrical

The proposal would generate up to 58MW of base load electricity, some of which would be used to power the facility itself with up to 55MW exported to the grid.

During start-up conditions, the EfW facility will need to import electrical load from the grid to enable the start-up process. Although the exact load will be determined during detailed design, this has been conservatively estimated to be 3MW.

To service the facility during operation, the high-voltage electrical cabling will enter the site along the western boundary, connecting to the existing ducts near the UGOH pole. This would be connected to the Endeavour Energy ducts which run under the M7. Doing this would minimise the need for excavations, which would decrease the risk of associated impacts such as dust, and limit disruptions to the M7 and Wallgrove Road.

Different options for connection have been discussed with network operators. Three feasible route options to connect WSERRC to the grid have been presented by Endeavour Energy (see Appendix D of **Technical report P Utilities and Services Assessment**). This comprises two 33kV options and one 132kV option. All options have been deemed to be technically feasible offering a viable connection to the local transmission network. The points of connection for both 33kV and 132kV are west of the proposal boundary, with the 33kV connection being adjacent to Wallgrove Road. The connection from the proposal site boundary to the 33kV or 132kV feeder offsite are related development and are covered in **Chapter 22 Related development**.

20.3.2.2 Water supply

The water demands from the proposal include:

- Potable water for welfare and cleaning facilities (drinking water, showers, facility washdown)
- Fire water for serving hydrants, cannons and sprinklers systems
- Process water to be fed into the boiler.

The water demands for the proposal are summarised in **Table 20.1**.

Table 20.1: Water demands for operation of the proposal

Water use	Average demand (L/s)	Peak demand (L/s)
Potable water	0.3	1.5
Fire water	18.0	113.1
Process water	9.0	

The peak fire water demand constitutes a significant demand on the existing water infrastructure. To reduce this peak demand, fire hydrant and sprinkler tanks will be arranged. During normal operations, only the potable water and process water flows will be taken from the Sydney Water network. Sydney Water confirmed that they could service the potable and process water demands for the proposal.

All process water would be reused within the facility, with the only losses as steam or quenching the incinerator bottom ash (IBA).

No effluent water will be produced in the EfW process. There are separate potable water and fire water mains proposed, however they will connect into the same Sydney Water Main on Wallgrove Road.

Consultation with Sydney Water has confirmed that the potable and process water demand for the proposal can be met and the proposed connection point on Wallgrove Road can to serve the proposal.

The possibility of supplying the facility with recycled water for use in the EfW process was thought of and this was assessed in consultation with Sydney Water. Based on this assessment, the supply of recycled water to the site was not considered feasible due to the lack of existing recycled water infrastructure in the surrounding area. No recycled water is proposed to be used for the EfW facility.

20.3.2.3 Sewer

The wastewater to be discharged to the Sydney Water networks will be generated from the welfare facilities (kitchens and toilets) within the administration building, visitor and education centre and general site uses, from washdowns and cleaning. There will be no process water discharged to sewer, given that it is wholly consumed as steam and used for quenching of fly ash. So, sewer discharge rates from the proposal will be relatively low. **Technical report P Utilities and Service Assessment** calculates the estimated flows based on occupancy rates of 50 staff and 100 daily visitors to be 0.25L/s and a peak flow of 1.5L/s.

Consultation with Sydney Water has confirmed that the proposed connection point on Roussell Road has capacity to take the sewer demand generated by the proposal.

20.3.2.4 Telecommunications

To control and monitor all processes and components during operation a Continuous Emissions Monitoring System (CEMS) is proposed.

The operation of the CEMS requires an extensive telecommunications network. To enable the continuous operation of the EfW facility and to mitigate the impact of external factors, a hard-wired telecommunications connection has been proposed.

A FTTP connection is proposed to supply a hard-wired service connection to the site. Consultation with NBN has confirmed that a FTTP connection is feasible and that the connection will be made from existing NBN network infrastructure on Wallgrove Road (to the south of the proposal) to the proposal site.

20.4 Mitigation

Table 20.2 describes the proposed measures to mitigate the potential impacts on utilities and services during construction and operation of the proposal.

Table 20.2: Utilities and services mitigation measures

ID	Impact	Mitigation measure
Design embedded mitigation measures		
US1	Power consumption	The proposal avoids additional demand on the capacity of the electricity supply network by generating electricity and exporting it to the grid.
US2	Warragamba Pipelines – vibration damage	In line with the Guidelines for Development Adjacent to the Upper Canal and Warragamba Pipelines, the proposal site layout has been configured, such that the waste bunker (the deepest excavation of the proposal) is located over 150m away from Pipeline Corridor, minimising the risk of vibration impacts on the pipelines.
Construction mitigation measures		
US3	Demand on network	Generators may be used during construction to supplement the power offtake and commissioning activities.
US4	Disruption to network	The timing for any connections/disconnections to existing services will be scheduled to avoid any peak periods and determined in consultation with the utility suppliers to avoid impacts to the existing live networks. Community engagement will be conducted as appropriate to keep the community informed of works and potential service/supply disruptions which may affect them.
US5	Excavation	Spare conduits that cross under the M7 will be used where possible to minimise excavations and mitigate disruptions.
US6		The works for private connections within the proposal site will coincide with bulk earthworks, thus reducing the amount of excavation and trenching needed. Spare conduits will be used for electrical and telecommunication networks which would allow laying new cables without additional earthworks.

ID	Impact	Mitigation measure
US7	Warragamba Pipelines – spills	Any impacts from accidental spills or discharge of chemicals or hydrocarbons, such as fuels and oils in vehicles and/or equipment, will be managed by a spill management plan.
US8	Warragamba Pipelines – sediment runoff	Erosion of soil and sedimentation through stormwater runoff and as result of earthworks and potential vegetation removal will be managed through erosion and sediment control measures to avoid any potential impact to the Warragamba Pipelines.
US9	Warragamba Pipelines – corrosion and earth potential rise	The generation of electricity by the EfW facility has the potential to cause corrosion of the pipelines by low frequency induction. The proposed HV cables will be buried underground, in line with Service and Installation Rules of NSW and Endeavour Energy requirements. The cable routes will be positioned at a minimum of 20m from the pipeline corridor to reduce potential corrosion of the Warragamba Pipelines.
US10	Warragamba Pipelines – vibration damage	Low vibration generating items of excavation plant and equipment will be placed on the southern part of the site. To minimise risks posed by vibration, driven piles will be prohibited, with bored or augured piles used instead. Attended vibration monitoring will be conducted at the beginning of any vibration generating activities to confirm minimum working distances and to limit vibration transmission through the ground. Additional agreed mitigation measures during construction will include setting up a monitoring regime of the pipe protection during the construction of the proposed works and managing traffic flows over the access road, so that WaterNSW retains access to the pipeline corridor and allow activities that maintain the function of this critical asset.
US11	Demolition impacts	Demolition work is to be carried out in line with Australian Standard AS 2601-2001 The Demolition of Structures to avoid impacts on existing infrastructure.
US12	Underground services	A Dial Before You Dig (DBYD) 1100 service in line with the requirements of the *Electricity Supply Act 1995* (NSW) will be carried out before starting underground activity.
Operation mitigation measures		
US13	Demand on water network	Fire and water tanks are proposed to lower the peak water demand on Sydney Water's potable water network.
US14	Warragamba Pipelines – vibration damage	Several vibration generating items will be installed on site such as the turbine and the ACC. The turbine hall is located over 100m and the ACC 60m from the southern boundary of the proposal site. Items that generate vibration have been located about 50m away from the pipeline corridor. The turbine, which creates the most vibration, is located about 100m from the pipeline corridor and will be founded on a piled raft which will incorporate a spring damper system to reduce the vibration effect of the equipment.
US15	Warragamba Pipelines – explosion risk	Most hazardous materials are being stored within the EfW building and are clear of the pipeline corridor. The materials stored are well understood and specific guidance is available for the appropriate protection of these chemicals from sources such as Australian Standards. Items stored externally will be bunded and secured in line with Australian Standards, to mitigate any potential risks to the Warragamba Pipelines.