3. PROJECT DESCRIPTION

3.1 Study Area

For the purposes of the Concept Plan application, the subject area encompasses much of the wider South Jerrabomberra urban release area, including the properties known as Poplars, North and South Tralee, Environa, Forrest, Morrison and Robin. Figure 2 identifies these lands.

The Concept Plan application area comprises a number of separate land parcels under different ownership. The consent of all land owners will be provided with the submission of the environmental assessment.

3.2 Concept Plan Application

3.2.1 Key Elements

The key requirements for water supply and wastewater infrastructure to service the South Jerrabomberra urban release area have been investigated by AECOM (2009) in the report *South Jerrabomberra Servicing Strategies*. The key outcomes of this report constitute the main focus of this Concept Plan Application.

Specifically, this application seeks Concept Plan approval of the following key infrastructure:

Sewerage collection and treatment:

- Construction of a new Sewerage Treatment Plan (STP);
- Sewage reticulation network; and
- Sewage pumping station.

Water supply networks:

- Connection to Googong watermain offtake;
- Potable and recycled water reservoirs;
- Potable and recycled water pumping stations; and
- A dual (potable/recycled) reticulation network.

Infrastructure corridor:

- An access road; and
- Trunk utility servicing easement.

The estimated cost of the infrastructure in the Concept Plan application is $102.5 million. The following sections provide details about the main elements that are associated with these three key infrastructure items.

3.2.2 Sewerage Collection & Treatment

Sewerage Treatment Plant:
The proposed method for the treatment of waste water generated by the South Jerrabomberra release is through the construction of a new sewerage treatment plant (STP) to service a flow of 5MLD. This STP would be an advanced water treatment facility producing effluent of non-potable reuse standard.

The new STP is proposed to be located in the south west corner of the Poplars site as shown in Figure 3. This location has been chosen as the preferred location as it has a number of key attributes:

- Lowest point in the catchment of the South Jerrabomberra urban release area;
- Located away from the residential land uses;
- Located close to existing and proposed industrial uses and community facilities that may potentially be major users of recycled water; and
- Close to Jerrabomberra Creek.

It is proposed that the development of this new STP is undertaken in three stages: an initial package plant; the first process train of the STP; and finally a second process train to service the ultimate development of South Jerrabomberra. Each of the process trains would be able to treat half of the total ultimate flows from the South Jerrabomberra area. The construction and operation of the initial package plant and the first process train is subject to the Project Plan Application (see below). Based on the predicted development rate, the construction and operation of the second process train would not be required until approximately 2018. This second process train is not included as part of this application and would be subject to a separate approval process at a future date.

A buffer zone will be required around the new STP, which will play an integral role in reducing the potential impacts of STPs to acceptable levels. The potential offsite impacts associated with the STP include odour, noise and light from the normal and abnormal operation of the facility, and dust from the handling of solids at the site. The existing and proposed land uses around the proposed STP location are compatible with those that are generally considered acceptable to be in an STP buffer zone, such as:

- open space;
- recreation areas;
- public roads;
- drainage basins and constructed wetlands;
- natural bush/forest and flora and fauna reserves;
- certain industries (eg. a food processing industry may not be compatible); and
- agricultural use.

Meteorological advice will be sought to ascertain likely air flows around the proposed site so that appropriate buffer areas can be established, in accordance with the NSW DECC Odour Criterion and related performance criteria. It should be noted that the impacts from odorous air contaminants are often nuisance related rather than health related.

The ultimate development cost of the proposed STP is expected to be in the order of $38 million.

Sewerage Collection Network:

The sewerage collection network will be governed by the natural topography of the South Jerrabomberra urban release area, and will ensure that the majority of the network will be able to drain via gravity. The natural topography results in the urban release containing two major and one minor sewerage catchments, as shown in Figure 3. The main components of the sewerage collection network are:

- Line 1 servicing the western side of the urban release area;
- Line 2 servicing the eastern side of the urban release area;
- Line 3 servicing the area in the vicinity of the STP.

AECOM (2009) have estimated that ultimately an Average Dry Weather Flow (ADWF) of around 5 MLD from these three catchments will be discharged to the proposed STP. This will comprise of 3MLD from Line 1 and 2MLD from Line 2.

Line 1, servicing the western urban release area, will consist of a single pipeline servicing the properties of North Tralee, Environa, South Tralee, Forrest, Morrison, along with the future developments areas of

Henry Morrison and Sandra Walsh. This entire catchment area is capable of draining under gravity to the proposed STP.

Line 2, servicing the eastern urban release area, will consist of a main pipeline extending from the southern point in Robin to the proposed STP. This pipeline will service the properties of Robin (North and South) and a residential component of Environa. This line will be able to drain the majority of the catchment via gravity. However, there may be a requirement for a small sewage pumping station (SPS) and section of rising main to service a portion of the Robin North area. This would need to be further assessed following the determination of the urban development boundaries, via the local environmental study process.

The Poplars property is also connected into Line 2, via a branch pipeline. This area will be able to drain into Line 2 and the STP via gravity. During the detailed assessment, the availability of spare capacity in the existing Jerrabomberra sewage collection network will be examined to determine if there is an option of connecting the northern portion of the Poplars into the adjacent existing system.

The ultimate development of the proposed sewage collection network is expected to be in the order of $10 million.

3.2.3 Water Supply Networks

Potable Water:
The South Jerrabomberra urban release area will be supplied with potable water sourced from the Googong Bulk Supply Main (BSM), which contains water from the Googong Water Treatment Plant. ActewAGL the owner/operator of the Googong BSM, have advised that the predicted future maximum daily demand of 6MLD can be supplied.

ActewAGL has confirmed that it would oppose an additional off-take from the Googong BSM. Therefore, the connection location will be at the existing '1st Queanbeyan Offtake'. ActewAGL have advised that the hydraulic grade line at the 1st Queanbeyan Offtake is RL685 AHD, which is sufficient for the potable water to be supplied by gravity flow to the South Jerrabomberra area, to either a reservoir or a water pumping station located in the Poplars.

The proposed potable water reticulation throughout the South Jerrabomberra urban release area is shown in Figure 4. This reticulation network indicates that a water transfer main will be travel along Edwin Land Parkway/Tompsitt Drive into the Poplars, then head south via a water pumping station to a reservoir located at a high point in South Tralee. The height of the water reservoir will allow the water to be reticulated via gravity throughout the entire urban release area, via a network of distribution lines. In order to maintain appropriate pressures, appropriate pressure reducing valves and boosters may need to be installed; however this detail will be considered during the detailed design of future stages and subject to relevant approvals.

The ultimate development cost of the proposed potable water reticulation network is expected to be in the order of $23.5 million.

Recycled Water:
The South Jerrabomberra urban release area will be supplied with recycled water sourced from the proposed STP located in the south west corner of the Poplars property. The recycled water reticulation network would closely match the potable water network.

The proposed recycled water reticulation throughout the urban release area is shown in Figure 5. This reticulation network includes a recycled water pumping station and storage tank at the proposed STP with a transfer pipeline to a reservoir located at a high point in South Tralee. This would be adjacent to the potable water reservoir. The height of the reservoir will allow the water to be distributed throughout the development area under gravity; however the system pressure may need to be regulated by the use of pressure reducing valves or booster pumps.

The design of the recycled water reticulation network will be in accordance with the Sydney Water Design Criteria Guidelines which are based on developments using dual reticulation systems in Rouse Hill and Newington.

The ultimate development cost of the proposed potable water reticulation network is expected to be in the order of $21 million.

3.2.4 Infrastructure Corridor

Access Road:
During 2009, the Queanbeyan City Council commissioned the *Googong and Tralee Traffic Study* (the 'Traffic Study'), which considered the impact on the Queanbeyan road network of all the development proposed in the Endorsed Strategy.

This Traffic Study was undertaken by Gabites Porter and involved running a gravity traffic model involving the generation and generation of traffic to estimate the traffic on existing roads and proposed new connections. This model operated at a city wide level, therefore did not deal with the specific details of individual urban release areas.

The proposed access road within the Infrastructure Corridor is in accordance with the road network contained within the Endorsed Strategy, and will facilitate the early development of the Endorsed Strategy Stage 1 lands, particularly North Tralee and South Tralee, along with providing access to the proposed sewerage treatment plant.

The proposed access road will connect on to Lanyon Drive, adjacent to the existing grade separated rail line crossing on the NSW-ACT border. It is proposed that this road connection will be a signalised "T" intersection catering for all movements.

A typical cross section of the Infrastructure Corridor is shown in Figure 6. The indicative concept arrangements of the Lanyon Drive intersection is shown in Figure 7.

Trunk Utility Service Provision:
In order to be able to service the South Jerrabomberra urban release area, the service providers will be required to connect into their existing networks and extend these into the development area.

The majority of the infrastructure supply networks are currently located in the vicinity of Lanyon Drive, therefore the provision of services along the infrastructure corridor from Lanyon Drive to South Tralee is the most logical and cost effective option. This will ensure that the sewerage treatment, the North and South Tralee properties can be serviced to allow for urban development to commence.

The trunk utility services that may be accommodated in the infrastructure corridor include a gas supply pipeline, an electricity transmission line and telecommunications supply (including the Commonwealth's National Broadband Network requirements).

The access road and utility servicing provision in the infrastructure corridor is expected to cost in the order of $10 million.

Figure 3: South Jerrabomberra Sewerage Infrastructure Concept Plan

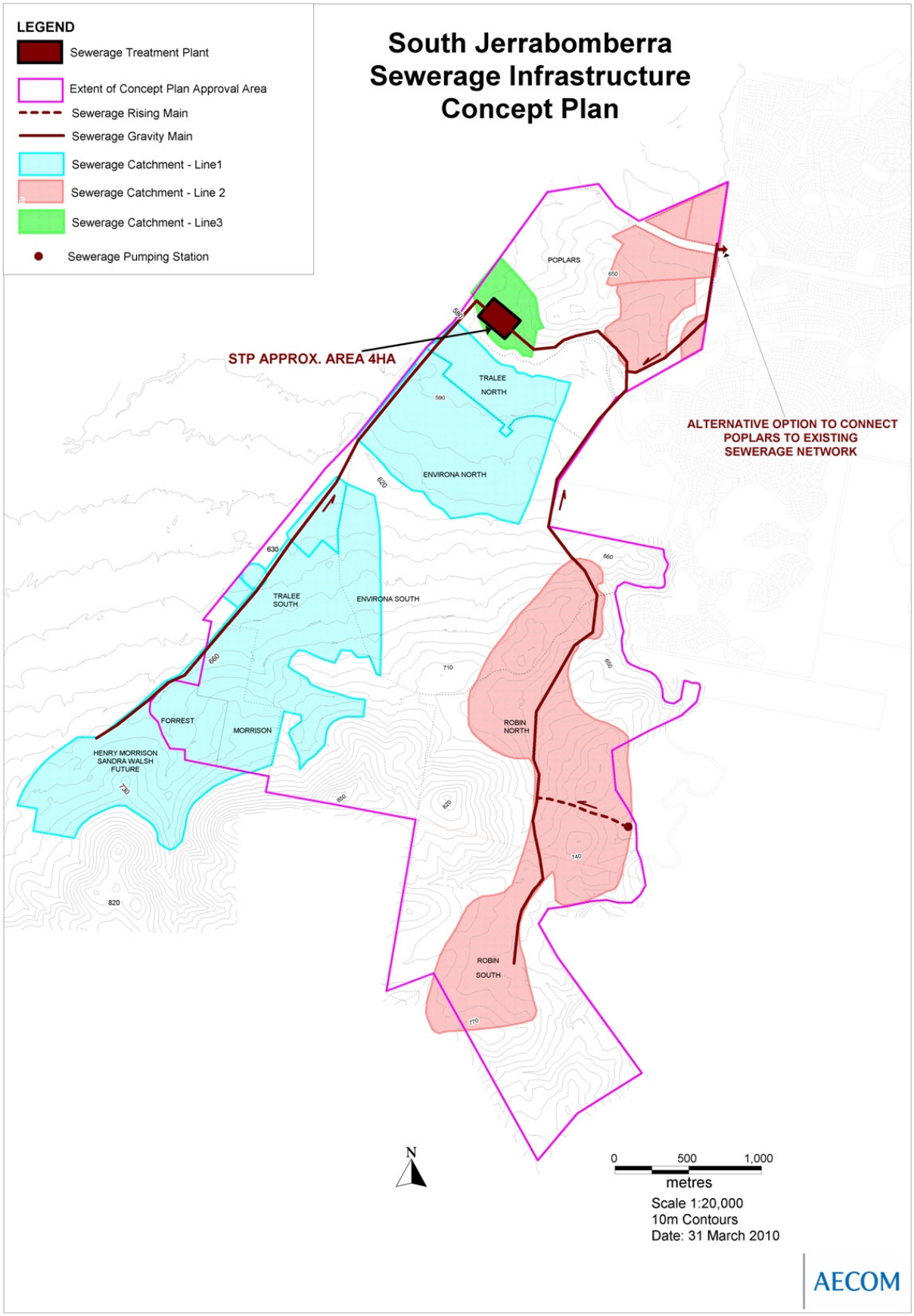


Figure 4: South Jerrabomberra Water Infrastructure Concept Plan

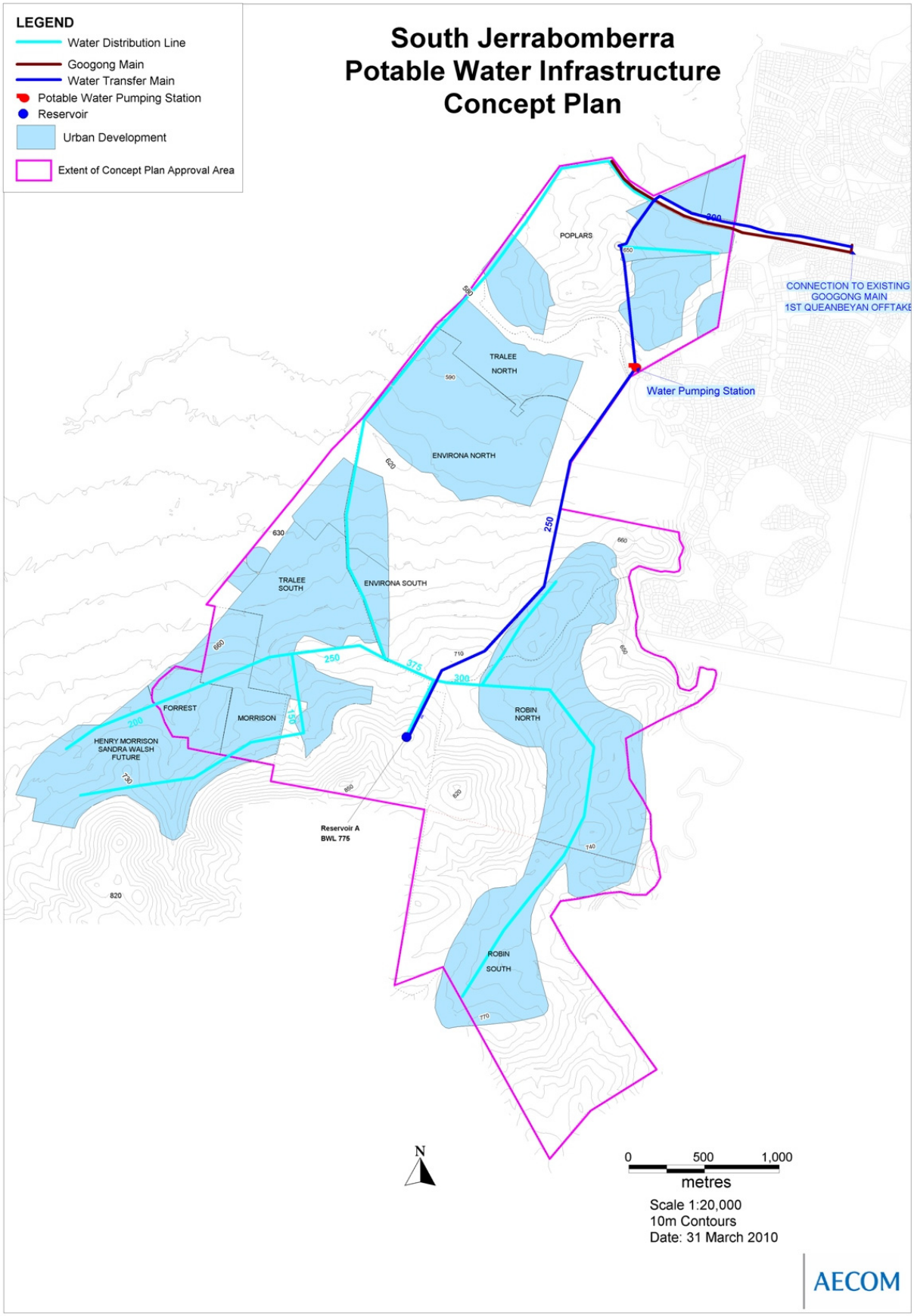


Figure 5: South Jerrabomberra Re-cycled Water Infrastructure Concept Plan

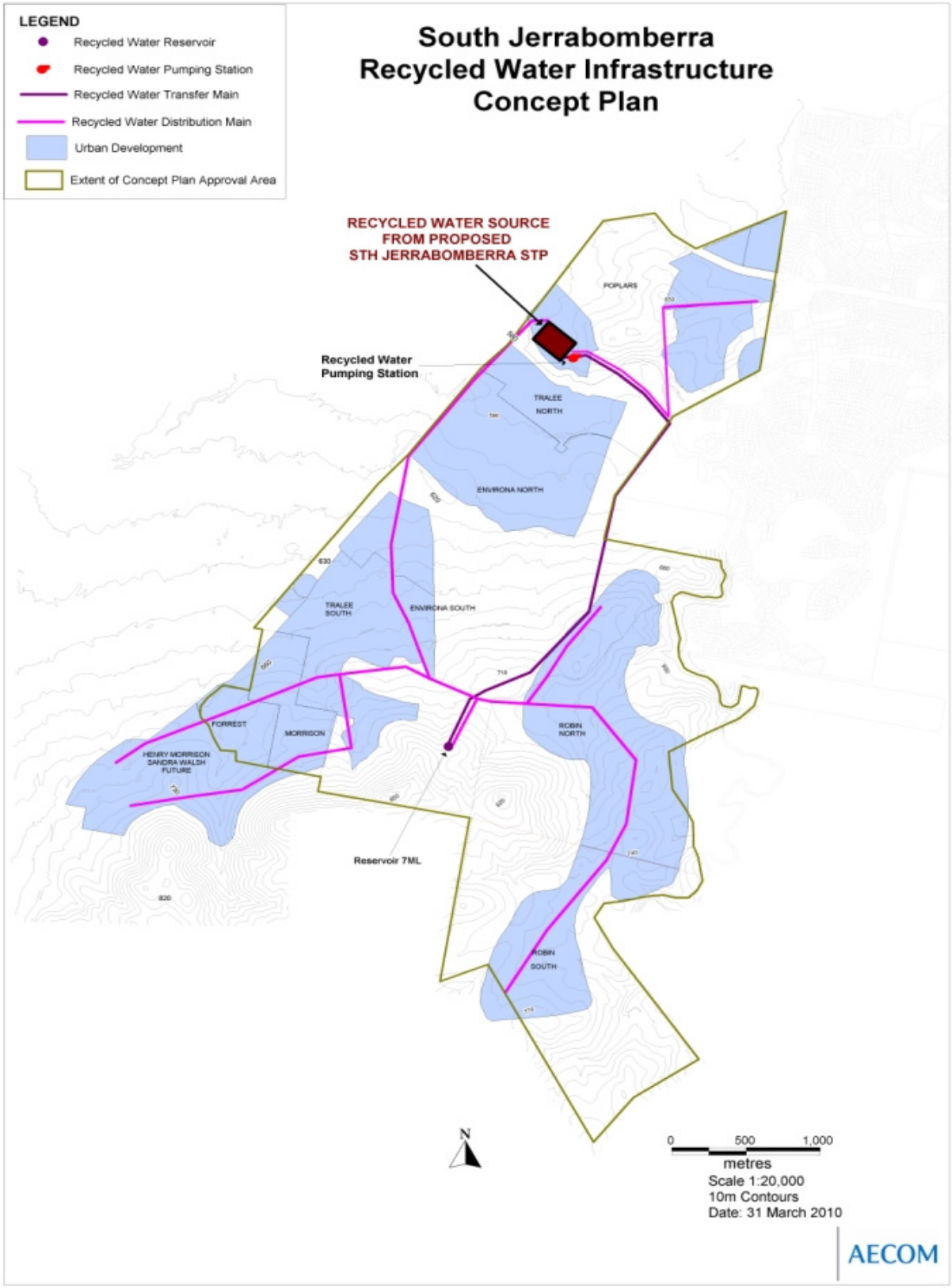


Figure 6: Infrastructure Corridor Typical Cross Section (Source: Brown Consulting)

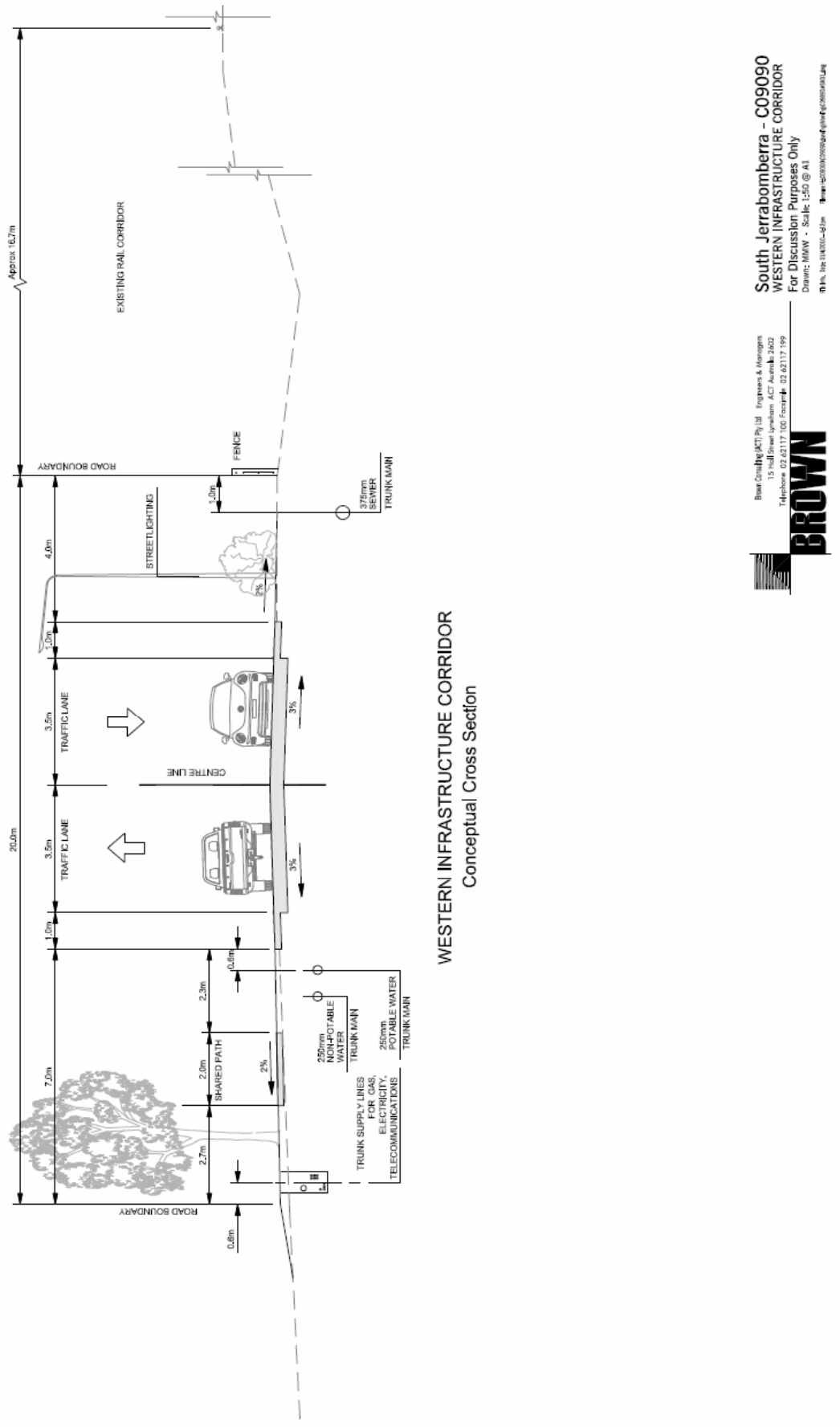
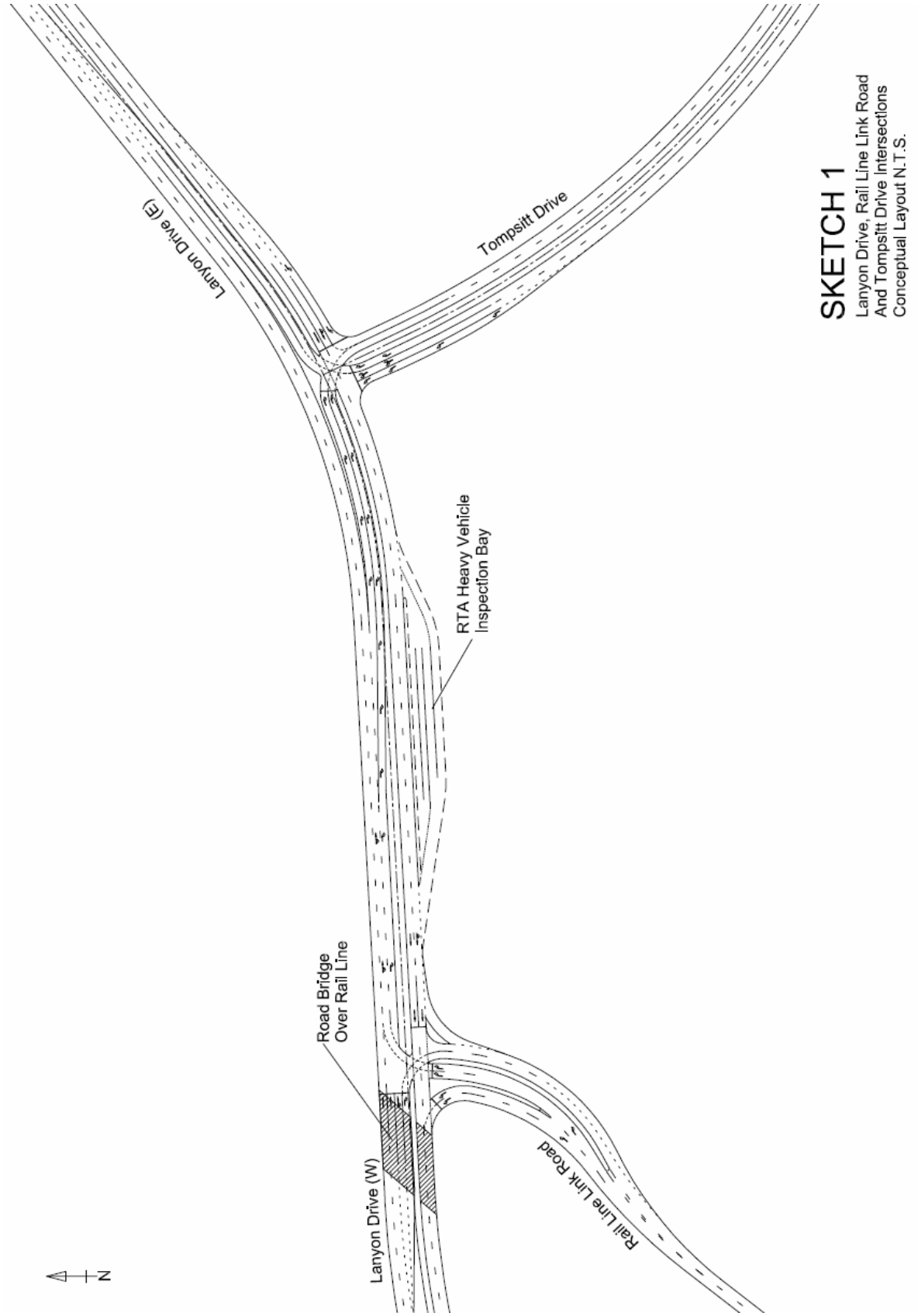


Figure 7: Conceptual Intersection Arrangement - Lanyon Drive/Western Infrastructure Corridor Road (Source: ARUP)



3.3 Project Plan Application

3.3.1 Key Elements

This Project Plan application will deliver the initial infrastructure necessary to service the properties identified as Stage 1 in the Endorsed Strategy, namely the Poplars, North Tralee and South Tralee. As a result the following key items constitute the Project Plan Application:

Sewerage collection and treatment:

- Construction of a the first stage of the Sewerage Treatment Plan (STP); and
- Sewage Collection Line 1

Water supply networks:

- Connection to the Googong watermain offtake;
- Potable water transfer and distribution mains;
- Recycled water transfer and distribution mains;
- Potable and recycled water pumping stations; and
- Potable and recycled water storage reservoirs.

Infrastructure corridor:

- An access road; and
- Trunk utility servicing easement.

The estimated cost of the infrastructure in the Project Plan application is between $35-40 million.

The following sections provide details about the main elements that are associated with these three key infrastructure items. The location of the various works is shown in Figures 8-10.

3.3.2 Sewerage Collection & Treatment

Sewerage Treatment Plant:
As identified in the Section 3.2, it is proposed to construct a new sewerage treatment plant to service the South Jerrabomberra urban release area.

The project plan application will allow for the construction of the following components of this facility:

- an initial package plant; and
- the first process train of the STP

The initial package plant will have a capacity of 1 ML/D and will be able to service the urban release in the initial stages. This will allow the design and construction of the sewerage treatment plant to occur concurrently with the development and release of the first stages of the residential development.

The first process train of the STP will allow for the urban release area to develop to around 14,000EP, before the second process train needs to be operational. The preliminary analysis has been undertaken on the assumption that the STP will be a Membrane Bio-Reactor (MBR) type facility; however this will be examined in greater depth during the environmental assessment.

The treatment type adopted for both the package plant and the first stage of the STP will need to produce treated water to meet the requirements of the Australian Guidelines for Recycled Water (NRMMC, 2008).

It is anticipated that in the initial stages of the development that there will be surplus recycled water produced by the STP. During the environmental assessment, options for disposal of this water will be examined, including:

- Suitability for agricultural irrigation;
- Options for industrial use;
- Discharge into Jerrabomberra Creek; and
- Transfer to an existing sewerage system

Sewage Collection Network:
The Project Plan application relates to the initial section of Line 1, which will run between the northern end of South Tralee and the proposed STP. This sewage pipeline will be a gravity line and be located in the infrastructure corridor.

3.3.3 Water Supply Networks

Potable Water:
The component of the potable water network that forms the Project Plan application is shown in Figure 8 and includes the following components:

- Connection to the Googong Bulk Water Supply Main at the 1st Queanbeyan Offtake;
- A water transfer main along Edwin Land Parkway/Tompsitt Drive, Lanyon Drive and along the infrastructure corridor to the STP;
- A temporary water storage reservoir, potentially located at the proposed STP and booster pump; and
- A water distribution main from the STP to the northern end of South Tralee.

Recycled Water:
The component of the recycled water network that forms the Project Plan application is shown in Figure 9 and includes the following components:

- A temporary recycled water storage reservoir located at the proposed STP;
- A booster pump; and
- A recycled water distribution main from the STP to the northern end of South Tralee.

3.3.4 Infrastructure Corridor

As identified in Section 3.2.4, the Infrastructure Corridor contains the access road servicing the proposed sewerage treatment plan and South Tralee, along with the provision of trunk distribution lines for service utilities. These works also form part of the Project Plan Application.

A typical cross of the Infrastructure Corridor is shown in Figures 6 and 7, and contains the following components:

- A two lane road;
- The potable and recycled water distribution mains;
- Sewerage pipeline (Line 1) between the northern point of South Tralee and the proposed sewerage treatment plant;
- An electricity supply line, including a street lighting supply component;
- A gas distribution supply main; and
- Telecommunications conduits capable of housing Telstra, TransACT and fibre optic telecommunication cables (depending on demand)

Figure 8: Stage 1 - Sewerage Infrastructure

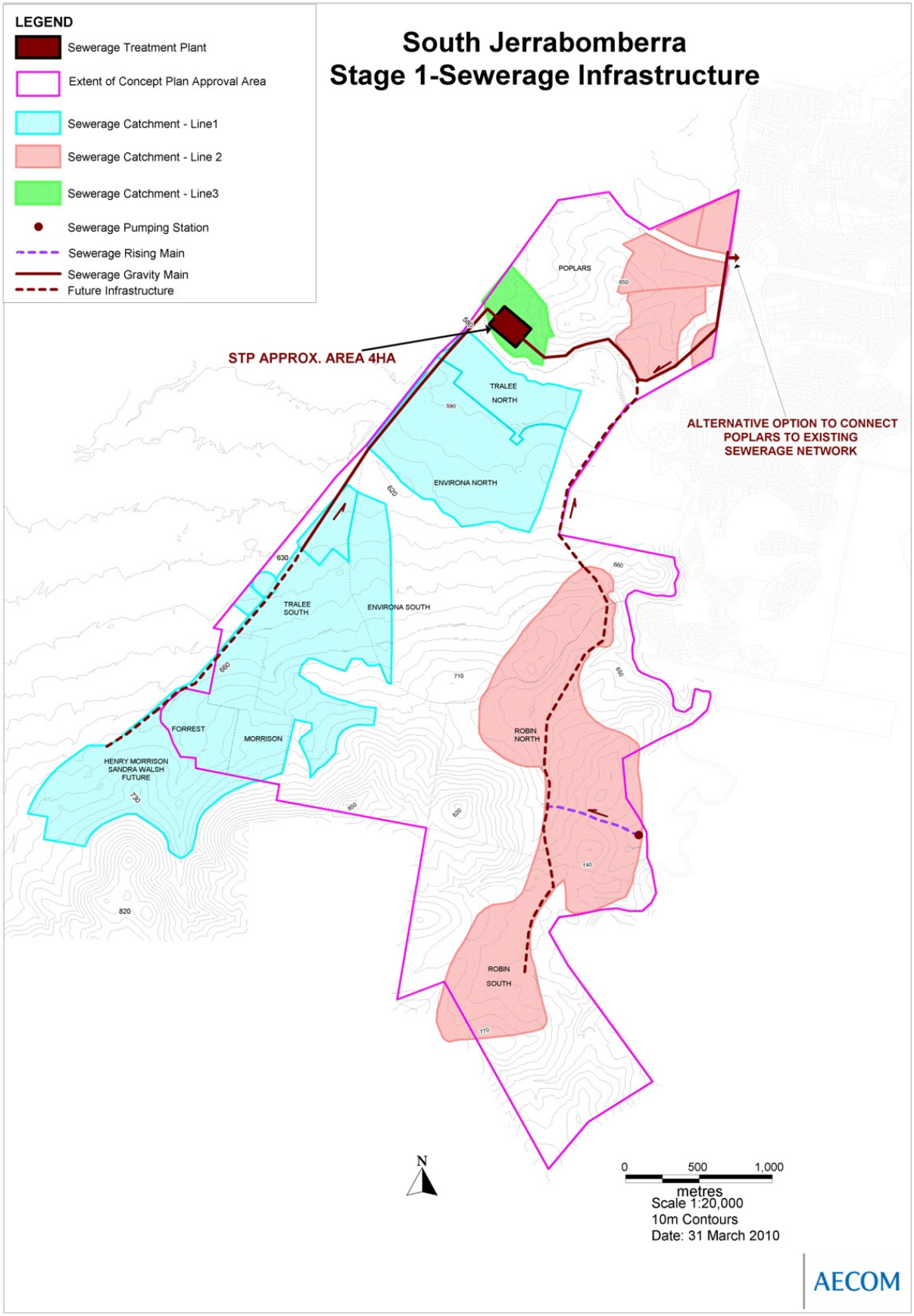


Figure 9: Stage 1 - Potable Water Infrastructure

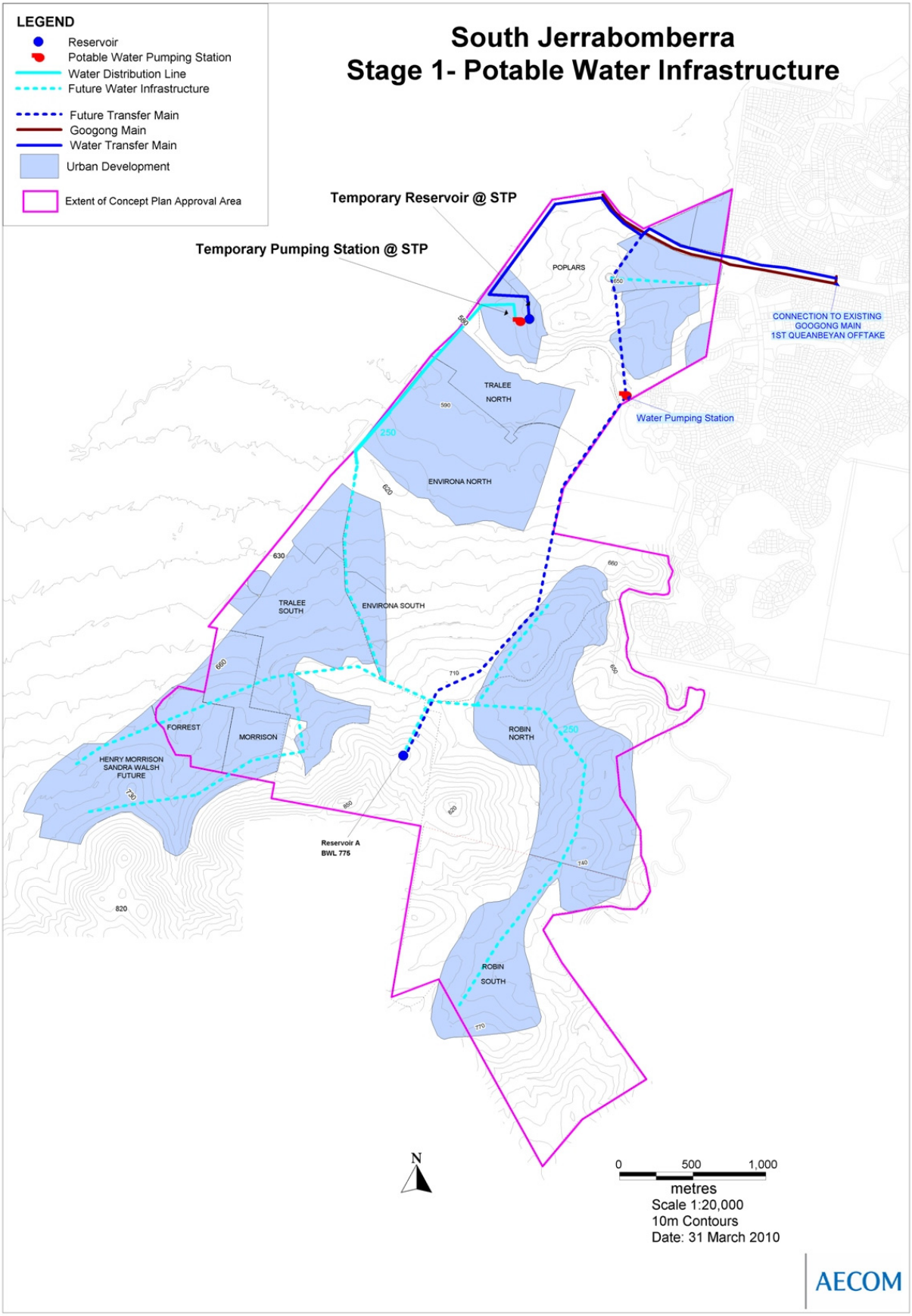


Figure 10: Stage 1 - Recycled Water Infrastructure