

2.5 Modification 3 — surface facility heights at the Fairfield RWTP

2.5.1 Description of the proposed modification

Condition of Approval 2.37 relates to the visual amenity and urban design impacts of the approved Project. Specifically, Table 1 within the condition outlines height limits for the various surface structures at the Fairfield RWTP. The height limits quoted within the table make provisions for access ladders and safety rails 1.2 m high on all the structures associated with the facility (i.e. the recycled water storage tank, feed balance tank, filtration building and so forth).

The current plant design features access ladders and safety rails 1.2 m high on all the structures except the filtration building. The filtration building would not have ladders and safety rails but would have ventilation apparatus on the roof. The 18.4 m Australian height datum (AHD) height, outlined in earlier correspondence with the DoP and quoted in the project approval conditions, would be the maximum on the building and associated features.

It is considered that the current wording of Table 1 (specifically the heading of column three) may lead to some misinterpretation. To avoid this, it is requested that Table 1 of Condition of Approval 2.37 be modified to read as follows:

Table 1 — Maximum height of surface facilities

<i>Item</i>	<i>Height limit (m AHD)</i>	<i>Height limit (including any access ladders, safety rails, roof ventilation apparatus)</i>
<i>Recycled water storage tank</i>	<i>15.1</i>	<i>16.3</i>
<i>Feed balance tank</i>	<i>14.7</i>	<i>16.0</i>
<i>Detention tank</i>	<i>14.9</i>	<i>16.2</i>
<i>Filtration (reverse osmosis) building</i>	<i>17.1</i>	<i>18.4</i>
<i>Degasser</i>	<i>15.9</i>	<i>17.2</i>
<i>Flocculation tank</i>	<i>13.5</i>	<i>14.7</i>
<i>Reverse osmosis tank</i>	<i>13.6</i>	<i>14.9</i>
<i>Reverse osmosis permeate collection tank</i>	<i>12.0</i>	<i>13.2</i>

2.5.2 Justification for the modification

The proposed modification to the wording of Condition of Approval 2.37 would not result in any modification to height limits of the approved buildings. The modification is intended to simplify and clarify the meaning of the clause and would not result in any augmentation to the environmental impacts of the Fairfield RWTP as previously approved.

2.6 Modification 4 — water recycling plant sewer connection line

2.6.1 Description of the proposed modification

The description of a sewer pipeline ('brine line') to connect the Fairfield RWTP to a suitable location on the existing sewer system was in the approved Project EA but its route was not detailed. This modification outlines the proposed alignment of this connection line (refer Figure 2-6). As described in the approved Project EA, the waste stream from the Fairfield RWTP will be discharged to the Malabar sewerage system via a connection to the local sewer system, under a trade waste agreement to be issued by SWC. The trade waste agreement is being negotiated between SWC and Veolia.

The proposed pipeline would consist of approximately 354 m of sewer pipeline. A site connection point to the Fairfield RWTP would be made within the south-east corner of the Fairfield RWTP (refer Photo 2-9) before traversing east for approximately 40 m to an internal road (Symons Street). The pipeline would then traverse south, generally following the alignment of Symons Street to the Fairfield SSTP site. The pipeline would generally be constructed at an off-set distance of approximately 3–5 m from the access track (refer Figure 2-7). It would then connect with the existing SWC sewer line to complete the connection with the Fairfield RWTP.

The sewer connection will allow all wastes from the recycling process associated with the Fairfield RWTP to be discharged directly to the local sewer in accordance with the trade waste agreement being negotiated with SWC.



Photo 2-6 Proposed sewer line connection point with the Fairfield RWTP (at blue fencing)

Source: Parsons Brinckerhoff Australia. October 2009.



Photo 2-7 **Route of the proposed sewer line from the Fairfield RWTP (within roadway)**

Source: Parsons Brinckerhoff Australia. October 2009.



Photo 2-8 **Typical vegetation along the route of the proposed sewer line (right side)**

Source: Parsons Brinckerhoff Australia. October 2009.

2.6.2 Land use adjacent to the sewer connection line

The proposed sewer connection line would traverse through land containing the existing Fairfield SSTP (zoned as Special Uses 5a – Water Board) under the Fairfield Local Environment Plan 1994. The land affected is a mixture of landscaped lawn featuring exotic grass species and a section of vegetation approximately 3 m wide beside an internal access road in the site of the Fairfield SSTP.

The land through which the connection line would traverse between the plant and the sewer connection point is vested with SWC. Consultation has occurred between AquaNet and SWC regarding the connection line (see Section 5) and an appropriate alignment proposed.

2.6.3 Justification for the modification

As described, the proposed sewer line was identified as a component of the Fairfield RWTP within the approved Project EA; however the route of the pipeline was not detailed. The Fairfield RWTP cannot operate without the pipeline and it is required for discharging the effluent generated from the treatment plant into the local SWC sewer network. Refer to Section 4 and Appendix E for further information.

Flora and fauna

The pipeline would be constructed within a mix of open space and would also require clearing a strip of vegetation approximately 3 m wide alongside Symons Road to install the pipeline through open trench construction. This vegetation is dominated by a canopy of *Casuarina glauca*, *Eucalyptus tereticornis* and *Corymbia citriodora*. The understorey was characterised by a dense infestation of woody weeds, including *Lantana camara* and *Ligustrum lucidum*. This vegetation has been identified as planted vegetation and its removal is not considered to represent a significant environmental impact.

The sewer connection line's route has also been located within an area of minimal fauna or suitable fauna habitats and which will follow the alignment of the existing internal roadway.

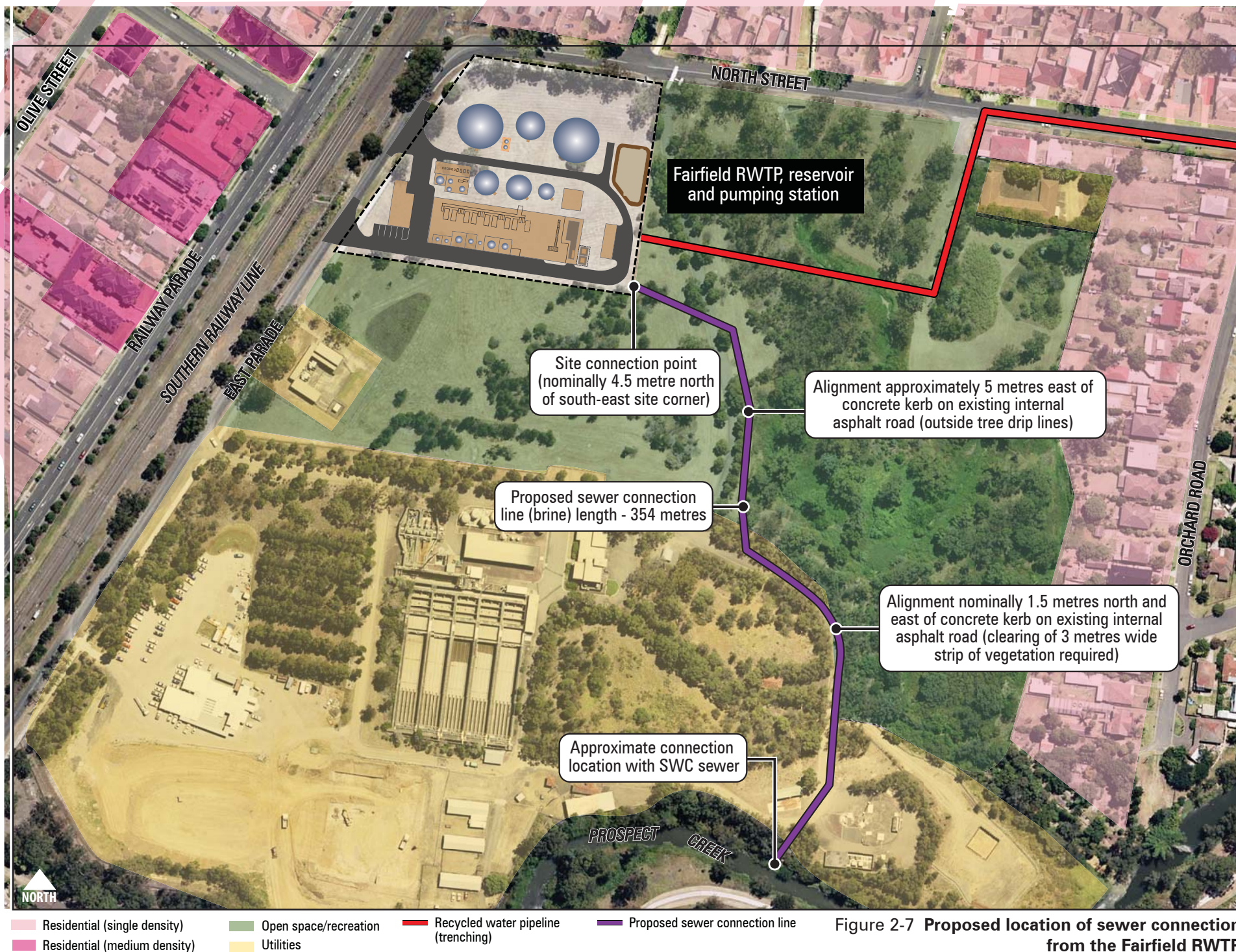


Figure 2-7 Proposed location of sewer connection from the Fairfield RWTP

2.7 Modification 5 — Woodville reservoir storage tank

2.7.1 Description of the proposed modification

The approved Project included an elevated surface reservoir to be constructed on the southern boundary of the Woodville Golf Course, on the northern side of Barbers Road. The Woodville reservoir will maintain supply to the Smithfield demand centre when the pumps at the Fairfield RWTP are not operating.

The approved Woodville reservoir comprises a single, cylindrical storage tank approximately 16 m in diameter and 3.6 m high. The reservoir was to be located towards the centre of the property and was designed with a storage capacity of approximately 0.7 ML and to be mounted on a supporting base structure. The base of the tank would be approximately 5 m above ground level, resulting in the top of the reservoir being approximately 8.6 m above ground level.

This modification reduces the number of trees that would be required to be removed as part of constructing the reservoir (refer Photo 2-9). To accommodate this, it is proposed to modify the size of the approved reservoir. The new reservoir would continue to comprise a single, cylindrical storage tank 12.8 m in diameter and 12 m high. It would no longer be supported by a structure above the ground, but rather constructed on the ground. The reservoir's storage capacity would be maintained as approximately 0.7 ML.

The reservoir would be located within the southern portion of the site with a setback of approximately 4 m from the southern boundary along Barbers Road (refer Figure 2-8 and Figure 2-9). A small concrete hardstand would also be constructed around the perimeter of the reservoir to allow vehicular access for maintenance and inspection.

Some additional visual impact may occur as a result of the reservoir's increase in height. This is expected to be minimal given the retention of a majority of the trees on the site and the distance to the nearest residential properties (approximately 50 m).

2.7.2 Land use at Woodville reservoir

The proposed Woodville Reservoir is located on the south-west corner of the Woodville Public Golf Course on Barbers Road, Old Guildford. The SWC pipeline easement is adjacent to the south-west corner of the site. Barbers Road contains a mix of low and medium density housing directly opposite the site. A golf course maintenance facility is located adjacent to the east of the site.



Photo 2-9 View of the Woodville reservoir site and existing vegetation

Source: Parsons Brinckerhoff Australia. October 2009.



Photo 2-10 View of the Woodville Reservoir site looking east from Barbers Road

Source: Parsons Brinckerhoff Australia. October 2009.



Figure 2-8 Original layout of the Woodville reservoir (from approved EA)

Source: Parsons Brinkerhoff. January 2009

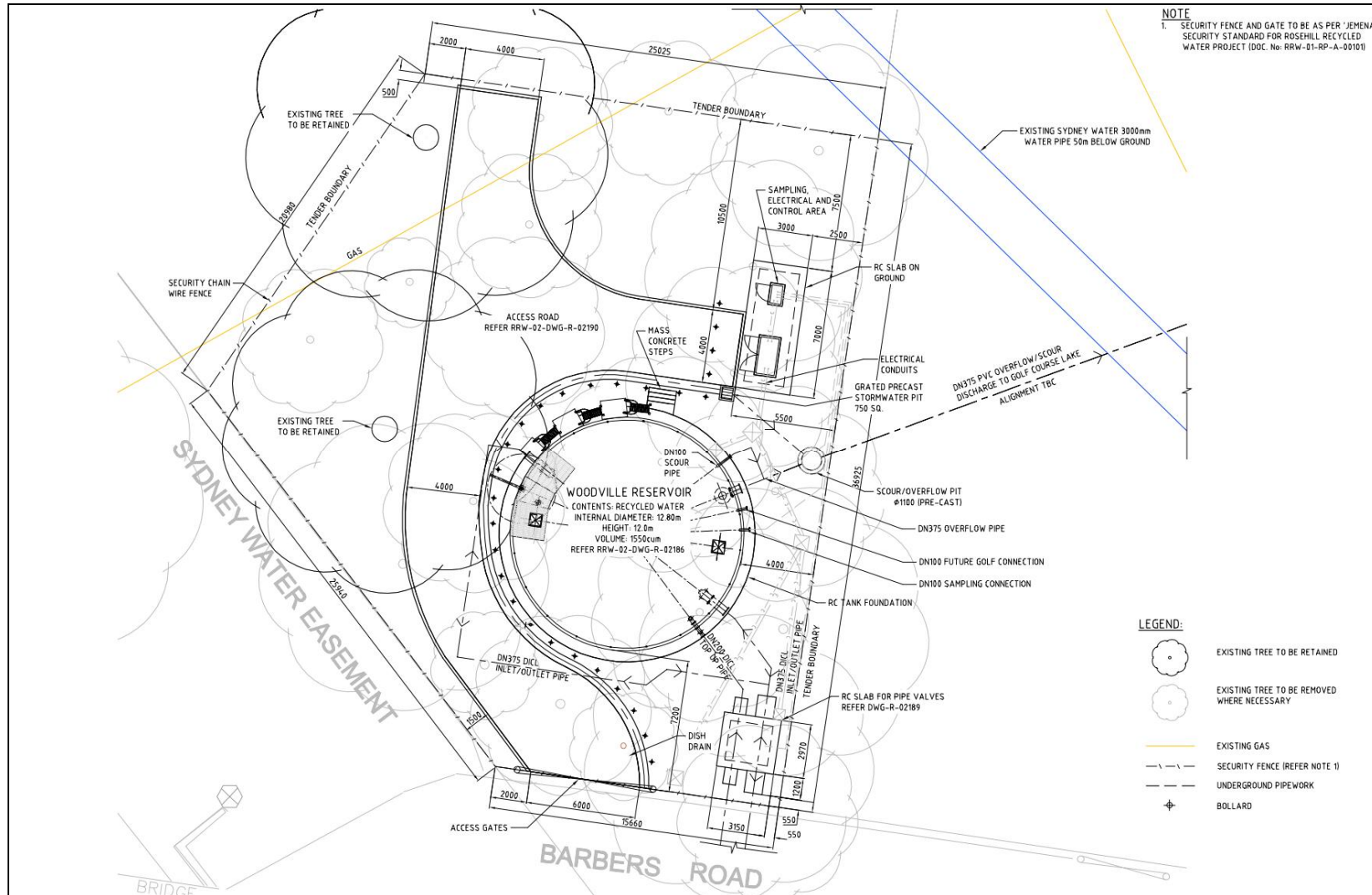


Figure 2-9 Revised layout of the Woodville reservoir site

Source: Jemena Asset Management. December 2009.

2.7.3 Justification for the modification

By increasing the height of the approved reservoir, the proposed amendment to the design of the Woodville reservoir would allow for an improved hydraulic operation of the overall Camellia and Rosehill recycled water network.

Flora and fauna

Construction of the reservoir as approved was estimated to require removing approximately 17 trees within the site. The revised location and scale of the proposed reservoir does not propose to remove any additional trees. Jemena will make every effort to minimise the number of trees removed from the site.

The area has also been identified as providing minimal fauna habitats that will be affected by the modification proposed.

Visual Impact

The potential visual impact of the modified reservoir has been considered as part of this project. Parramatta City Council has provided support for the modification (correspondence dated 24 December 2009 – Appendix F). In addition, in correspondence between Jemena and local resident in Barbers Road (dated 20 January 2010), Jemena has indicated that they will replace any trees removed as a result of the reservoir at a ratio of 2 to 1 for each tree removed.

The selection of the replacement trees for screening the reservoir and general revegetation of the site will be undertaken in consultation with Parramatta City Council to ensure the greatest screening of the reservoir which can be achieved. In addition, a detailed survey of the site has indicated that the existing trees to be retained on the site are of an equivalent height to the proposed reservoir and will assist in additionally screening the proposed reservoir.

2.8 Modification 6 — Rosehill reservoir storage tanks

2.8.1 Description of the proposed modification

The Woodville reservoir, another component of the approved Project, included a second surface reservoir and pumping station to be constructed at the corner of Durham Street and Grand Avenue, Rosehill. The site of this reservoir is the north-western corner of the Parramatta Terminal area of the Clyde refinery site (refer Figure 2-10). The reservoir site covers approximately 0.6 ha and is located approximately 200 m south of the Parramatta River. The approved design of the Rosehill reservoir comprises two cylindrical water storage tanks, which are each approximately 25.4 m in diameter and 6 m in height and have a storage capacity of approximately 3 ML.

The proposed modification allows for fewer reservoirs present on the site. To accommodate this, it is proposed to replace the two proposed reservoirs with a single reservoir. The new reservoir would comprise a single, cylindrical storage tank with a diameter of 25.4 m and 11.72 m high. It would be located within the southern portion of the site with a setback of approximately 26 m from the western boundary along Durham Street (refer to Figure 2-11). The new reservoir would have a storage capacity of approximately 6ML.

2.8.2 Land use at the Rosehill reservoir and pumping station

The proposed Rosehill reservoir site is surrounded by industrial lands (including a set of rail tracks to the north of the reservoir site). To the north, across Grand Avenue is the Parramatta River and approximately 500 m west the Rosehill Gardens Racecourse.

2.8.3 Justification for the modification

As with the proposed modification to the Woodville reservoir, the proposed amendment to the design of the Rosehill reservoir would allow for an improved hydraulic operation of the overall Camellia and Rosehill recycled water network.

Land uses in the vicinity of the Rosehill reservoir and pumping station are predominantly industrial. There are no residential receivers near the proposed location. Given the industrial nature of the local area, proposed change in height and reduction in the total number of reservoirs, the modification would not adversely affect the local area.

The approved Project EA notes that the Rosehill reservoir site contains some potential contaminants within the soils. By reducing the footprint of the proposed reservoirs on the site, the amended design would result in a reduced area of soil disturbance and hence potential to disturb contaminated soils.



Figure 2-10 Original layout of the Rosehill reservoir and pumping station (from approved EA)

Source: Parsons Brinkerhoff. January 2009

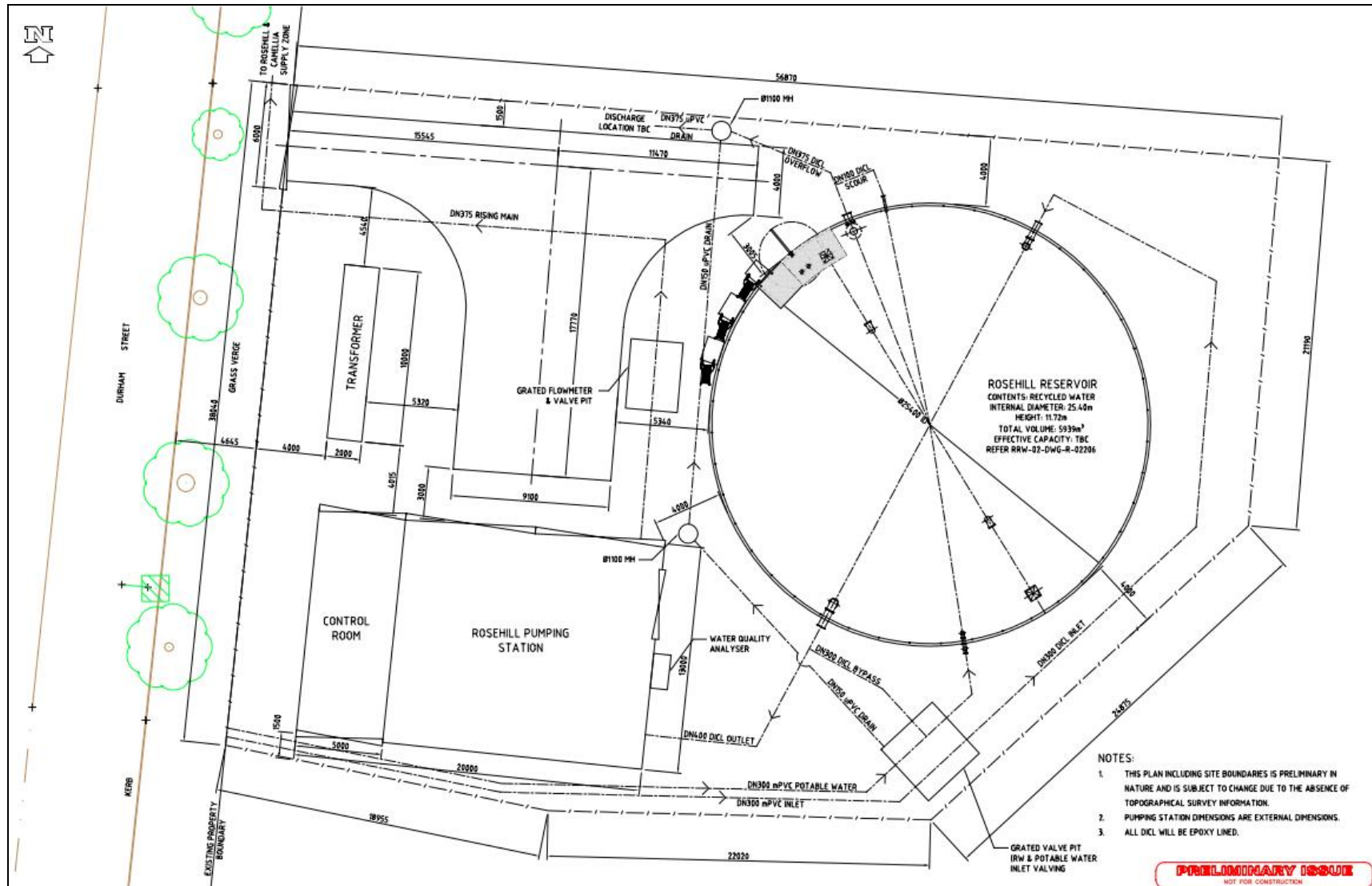


Figure 2-11 Revised layout of the Rosehill reservoir site

Source: Jemena Asset Management. November 2009.

2.9 Impact to conditions of approval

The modifications proposed would generally result in the need to modify only two Conditions of Approval under the existing Project Approval (07_0121). Specifically, the proposed modifications would affect condition 1.1 and condition 2.37.

Condition 1.1

Condition 1.1 currently states:

1.1 The proponent shall carry out the project generally in accordance with the:

- a) Major project Application 07_0121;
- b) Rosehill Recycled Water Scheme, Environmental Assessment, prepared by Parsons Brinckerhoff and dated January 2009
- c) Camellia and Rosehill Recycled Water Scheme Preferred project Report, prepared by Jemena Asset Management and dated 19 March 2009; and
- d) the conditions of this approval

Condition 1.1 of Project Approval 07_0121 would need to be modified to accommodate five of the six proposed modifications (Modifications 1, 2, 4, 5 and 6 as described above). It is proposed to modify the existing condition 1.1 to include the following:

(Note: strike-throughs indicate deletion and underlined text indicates additional wording):

1.1 The proponent shall carry out the project generally in accordance with the:

- a) Major project Application 07_0121;
- b) Rosehill Recycled Water Scheme, Environmental Assessment, prepared by Parsons Brinckerhoff and dated January 2009
- c) Camellia and Rosehill Recycled Water Scheme Preferred project Report, prepared by Jemena Asset Management and dated 19 March 2009; ~~and~~
- d) Environmental Assessment of the modification to the Rosehill Recycled Water project, prepared by Parsons Brinckerhoff Australia Pty Ltd and dated November 2009; and
- ~~e)~~ e) the conditions of this approval

Condition 2.37

The proposed amendment to the wording of condition 2.37 has been considered in detail in Section 2.5 of this report as 'Modification 3'.

2.10 Construction methodology

2.10.1 Recycled water pipelines and sewer connection line

The proposed construction techniques that would be used for the realigned pipe and sewer connection to the Fairfield RWTP would be similar to those proposed for the approved alignment of the pipeline. As described in the approved Project EA, different pipeline construction methods may be used at specific locations due to various local constraints (e.g. watercourse, major roadway).

For the proposed modification to the approved pipeline, three locations have been identified that will require alternative methods of construction to mitigate any potential impacts on sensitive areas. These sites include the following crossings and the proposed alternative construction methods¹:

- Vine Street — thrust boring
- Prospect Creek, Burns Creek and The Horsley Drive — horizontal directional drilling
- Burns Creek (west of Mandarin Street) — HDD.

The modified route alignment of the recycled water pipeline would follow the same principles as the approved Project EA by minimising disruption and impacts to traffic and local residents. The typical installation rates and nominal construction footprints associated with the pipeline construction would also be the same as those proposed in the approved Project EA. These are described below.

Table 2-1 Characteristics of the proposed pipeline construction methods

Construction method	Nominal construction footprint	Typical installation rate ²
Trenching	Approximately 6 m wide	30 m a day
HDD	Localised to entry and receiving pits Entry pit 6 x 30 m Receiving pit 6 x 12 m	Drilling up to 30 m a day and pipeline installation over 1–2 days, pulled through as a continuous string.
Thrust boring	Localised to entry and receiving pits Entry and receiving pits 5 x 10 m	15 m a day + time to excavate send and receive shafts.

These techniques were previously detailed in the approved Project EA. A summary of each of these methods follows.

Trenching

Trenching is proposed for most sections of the modified pipeline alignment. Trenching is the preferred technique where there is unlikely to be substantial disturbance or congestion caused to traffic by the works or where areas are not environmentally sensitive. Excavated spoil would generally be loaded directly onto trucks and transported off-site to a temporary storage compound or directly to a waste disposal facility as required.

¹ These techniques may be subject to change once on-site conditions have been fully assessed at the time of construction.

² These rates are subject to change given localised conditions at the time of installation.

Trenching, laying the pipeline and backfilling the trench would all occur on the same day (where possible) so that disruption to vehicular access is minimised.

Thrust boring

Boring is a less disruptive construction technique that would be used to cross major roads, rail lines and environmentally sensitive areas. The proposed road crossing at Vine Street between Fairfield Park and Makepeace Oval would require thrust boring.

This would require constructing a launch shaft from which to launch a remote-controlled cutting head and behind which a succession of smooth-walled pipes would be jacked. The proposed shaft would be located in the open area behind the Fairfield Leisure Centre (refer Photo 2-11).



Photo 2-11 View of potential launch shaft behind the Fairfield Leisure Centre

Source: Parsons Brinckerhoff Australia. October 2009.

Pipe (or pipe segments) would then form a tunnel beneath the sensitive area (Vine Street) until the shield reaches the destination or the reception shaft (to be located on the track near Makepeace Oval). The tunnel would be lined with a concrete or steel casing. Excavated spoil would be removed by an auger flight or by mixing with water and pumping to the surface for treatment and disposal.

Horizontal directional drilling

Horizontal directional drilling (HDD) is an alternative subterranean construction technique that is also used for major crossings (roads, creeks and environmentally sensitive areas). The proposed crossing under Prospect and Burns creeks at Makepeace Oval would require HDD.

HDD involves drilling a hole along a pre-determined alignment to allow the pipe to be pushed/pulled into a borehole. Spoil is then removed to the surface. Drilling equipment is then guided by the drill head, which steers the pilot hole in the desired direction before reaming operations. A tracking system would be used to ensure the drill stays on course. Drilling and pipe installation activities would generally be carried out from launch and retrieval pits, located at either end of the directional drill. For the proposed route modification, these would be located at the edge of the grassed area east of Makepeace Oval (launch pit) and the west end of Landon Street (retrieval pit). The launch pit would contain the drilling rig, power source for the rig, drill rods, pipeline lengths and general site equipment.

The launch and retrieval site layouts would be configured to avoid trees (where possible) and other sensitive sites. Both the launch and retrieval sites would be fenced and made secure, with site access control applied as appropriate. An area is also required to lay out the pipe before it is installed in the borehole. The area likely to be selected for this purpose is the grassed area east of Makepeace Oval where the launch pit would be located (refer Photo 2-12). This would result in minimal impact on any vegetation.



Photo 2-12 View of potential launch pit east of Makepeace Oval

Source: Parsons Brinckerhoff Australia. October 2009.

2.10.2 Woodville and Rosehill reservoirs

As described in the approved Project EA, construction of the Woodville and Rosehill reservoirs would involve some earthworks and site preparation works, construction of footings, building structures, and installation of associated pipe work, controls, power and any other ancillary services. It is not anticipated the proposed modification in the height and diameter of each of the reservoirs would alter the construction methods that have previously been approved.

Construction at each of these sites is also not expected to take longer because of the proposed modifications. Indeed, construction may take less time as a result of the removal of one of the reservoirs from the approved Project design at the Rosehill site.

2.10.3 Other construction impacts

Work site and compounds

Four preliminary site compound locations were identified in the approved Project EA, with final locations to be determined during detailed design. These locations were:

- Fairfield — proposed RWTP site at North Street
- Rosehill — proposed reservoir and pump station location
- Granville — an area currently used as a site compound bounded by Carrington, Hartington, and Elizabeth Streets, and Duck Creek
- Smithfield — land with the Prospect Creek recreation reserve.

The proposed modifications would not result in any modifications to the previously identified work sites or compounds.

Site restoration

The approved Project EA provided a description of the proposed processes after construction finishes at each site, including the removal of materials, equipment and other resources used during construction. This would include backfilling and compacting all trenches and surface restoration.

For each section of pipeline within the road corridor, sealed and paved surfaces would be restored and constructed in accordance with relevant requirements. Where the pipeline is installed in unsealed areas (such as Fairfield Park and Makepeace Oval) the trenched sections would be backfilled and the surface would be restored and revegetated, with species in character with the surrounding area and existing land use where required. These processes would be similarly applied for the proposed route realignment.

Plant and equipment

A list of typical construction equipment expected to be used for the project was included in the approved Project EA. The proposed modifications outlined in this assessment would not result in any additional plant or equipment being used outside of the scope of the previous approved Project EA.

2.11 Alternatives considered

2.11.1 Pipeline route and construction methods

The modified pipeline route has been designed to minimise construction impact. The route of the pipeline through the park is constricted by Prospect Creek. Any other route through Fairfield Park would require multiple creek crossings as such were not considered due to impact and project feasibility.

2.11.2 Reservoirs

It has been determined by additional hydraulic modelling that the Woodville Reservoir is required to be constructed to a certain height to achieve the hydraulic requirements of the network. The original design was the alternative to the modification design, which is an elevated reservoir. An alternative construction method considered to reach the hydraulic requirements of the network is to construct a lower reservoir, however in order to make up for the height difference a pumping station would have to be constructed. This would increase the size of the site and result in various noise impacts, therefore reducing the amenity of the nearby residents.

With respect to the Rosehill Reservoir, the configuration of the reservoir and pump station is required to service the customers at Rosehill such as Shell. The construction alternatives considered for this site relate primarily to the serviceability of the reservoirs. Whilst the original option providing two tanks would be easier to service, the increased size of the construction footprint across the site is significantly greater and would also lead to an increase in the potential to disturb sources of contamination within the site.

