Environmental Assessment of the modification to the Camellia and Rosehill Recycled Water Project

May 2010

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Glossary

Term or abbreviation	Definition
Approved Project EA	*Camellia and Rosehill Recycled Water Project Environmental Assessment*, Parsons Brinkerhoff, January 2009
AHD	Australian height datum
ASS	Acid sulfate soils – Soils that result from the aeration of soil materials that are rich in iron sulfides, primarily pyrite (FeS_2)
CEMP	Construction environmental management plan
DECCW	Department of Environment, Climate Change and Water
DoP	Department of Planning
EA	Environmental assessment
EEC	Endangered ecological community
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EPI	Environmental planning instrument
ESD	Ecologically sustainable development
Fairfield RWTP	Fairfield recycled water treatment plant
Fairfield SSTP	Fairfield storm sewage treatment plant
$L_{Aeq\ (15\ mins)}$	Equivalent sound pressure level over a 15 minute interval
$L_{A10\ (15\ mins)}$	Sound pressure level exceeded for 10 per cent of the time over a 15 minute interval
LEP	Local environmental plan
ML	Megalitre
PB	Parsons Brinckerhoff
POEO Act	*Protection of the Environment Operations Act 1997*
PPR	Preferred project report
RTA	NSW Roads and Traffic Authority
SEPP	State environmental planning policy
SREP	Sydney regional environmental plan
STP	Sewage treatment plant
SWC	Sydney Water Corporation
TSC Act	*Threatened Species Conservation Act 1995*

Executive summary

What is the Rosehill Recycled Water Project?

The Camellia and Rosehill Recycled Water Project (the Project) consists of the construction of a recycled water distribution network between Fairfield and Rosehill aimed at providing recycled water to large industrial water users. The Project's ancillary infrastructure includes a water recycling plant, pumping stations and two recycled water reservoirs, one at the Woodville Golf Course and the other within the industrial area of Rosehill. The Project is an important component of the NSW Government's 2006 Metropolitan Water Plan.

The approved Project comprises the following major components:

- a connection to the Liverpool to Ashfield Pipeline (LAP) — the source of feed effluent for the recycled water treatment process
- an RWTP, feed effluent storage tank, recycled water storage tank, pumping station and other equipment at North Street, Fairfield (known as the Fairfield RWTP)
- a distribution system, including:
  - an elevated surface reservoir at Woodville Golf Course on Barbers Road, Guildford
  - a surface reservoir and pumping station on the south-eastern corner of Durham Street and Grand Avenue, Rosehill
  - a distribution pipeline approximately 20 km long.

What modification is proposed to the approved Project?

This report has been prepared to support an application by the proponent, Jemena Asset Management Pty Ltd, to modify the existing project approval (No. 07_0121) for the Rosehill Recycled Water project and is intended to assist the Minister for Planning in forming a view as to the merits of the proposed modification.

This assessment addresses a proposed modification to part of the approved pipeline route between Normanby Street and Woodville Road. Specifically the proposed modification would add approximately 1.6 km of pipeline between Railway Parade and Woodville Road along Orchardleigh Street and would remove approximately 2.5 km of pipeline no longer required to be constructed along the southern part of the overall scheme along Normanby Street, Tangerine Street and the section of Woodville Road between Tangerine Street and Orchardleigh Street.

Modification approval process

The development of land within NSW is controlled by various parts of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The Camellia and Rosehill Recycled Water Project assessed and approved under Part 3A of the EP&A Act because the proposed development comprised a wastewater treatment plant with a capital investment value of more than $30 million. The Minister for Planning determined the application on 1 June 2009 subject to Conditions of Approval. Section 75W (within Part 3A) of the EP&A Act allows for a proponent to request the Minister for Planning to modify an approval for a project. This report has been prepared on behalf of the proponent to assess the environmental impacts of the proposed modification to the approved Project and request the modification of the existing Project Approval No. 07_0121 (refer to Appendix A).

What are the key environmental impacts?

The Department of Planning has formally advised the scope of investigations required to be addressed for the proposed modification. These include the following key issues:

- traffic and transport
- noise
- flora and fauna
- parklands
- waste generation and management
- soil and water quality
- hazards and risk
- environmental risk analysis
- consultation.

The key environmental impacts would be similar to those associated with the approved Project. These impacts would generally be short term and associated with the construction stage. Additionally, given the reduced length of the overall pipeline, the resulting impacts of the Project are considered to be reduced. These impacts would include disruption to property access, construction noise and traffic congestion.

The longer term impacts of the project would also be similar to the approved Project and would be minimal given the proposed pipeline would be located underground.

1. Introduction

1.1 Project background

In December 2005, Sydney Water Corporation (SWC) issued a request for expression of interest for the Camellia Recycled Water project. In November 2007, AquaNet Sydney Pty Ltd (AquaNet — previously known as the AVA Consortium) was named as preferred tenderer for the project, which was renamed the Camellia and Rosehill Recycled Water Project.

An environmental assessment (EA) for the Camellia and Rosehill Recycled Water Project for the construction and operation of a recycled water scheme between Fairfield, Smithfield and Camellia was prepared by Parsons Brinckerhoff (PB) in January 2009 on behalf of AquaNet and submitted to the Department of Planning (DoP). The EA assessed the potential environmental, social and economic benefits and impacts of the project. The Minister for Planning approved the application on 1 June 2009 subject to Conditions of Approval

A preferred project report (PPR) submitted by Jemena Asset Management Pty Ltd on behalf of AquaNet to the Department of Planning (DoP) in March 2009 detailed minor changes to the project as described in the EA, relating to the design and layout of the Fairfield recycled water treatment plant (Fairfield RWTP) and minor amendments to the proposed alignment of the distribution pipeline within North Street, Fairfield. The Minister for Planning determined the application (No. 07_0121) on 1 June 2009 subject to Conditions of Approval.

A modification report was submitted to DoP in February 2010 to modify six different components of the approved scheme, including realignment of a separate portion of the approved pipeline route. The previous modification submitted to DoP specific to the modified route is referred to within this report as ‘Route modification 1’. This modification was approved by the Department of Planning on 1 April 2010.

This report addresses the modification of part of the approved pipeline route between Normanby Street and Woodville Road. The proposed modification would add approximately 1.6 km of pipeline between Railway Parade and Woodville Road along Orchardleigh Street and reduces the need for approximately 2.5 km of pipeline along the southern part of the overall scheme along Normanby Street, Tangerine Street and the section of Woodville Road between Tangerine Street and Orchardleigh Street.

This modified route is referred to within this report as ‘Route modification 2’.

1.2 Purpose of this modification application

This report has been prepared to support an application by Jemena Asset Management Pty Ltd (Jemena) on behalf of the proponent, Aquanet, to modify the existing project approval for the Camellia and Rosehill Recycled Water Project (the approved Project) to assist the Minister for Planning in forming a view as to the merits of the proposed modification.

The application for modification has been prepared to:

- describe the changes to the existing project approval
- provide justification for the modification and describe the alternatives considered
- consider relevant environmental planning instruments
- identify the conditions of approval that are required to be modified by this application
- provide a revised Statement of Commitments
- assess the environmental and community impacts of the modification.

1.3 Modification approval process

The development of land within NSW is controlled by various parts of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The Camellia and Rosehill Recycled Water Project was assessed and approved under Part 3A of the EP&A Act as the proposed development comprised a wastewater treatment plant with a capital investment value of more than $30 million. The Minister for Planning determined the application on 1 June 2009 subject to a number of Conditions of Approval.

Section 75W (within Part 3A) of the EP&A Act allows for a proponent to request the Minister for Planning to modify an approval for a project. A modification is defined as meaning:

> '…changing the terms of a Minister's approval, including:
>
> (a) revoking or varying a condition of the approval or imposing an additional condition of the approval, and
>
> (b) changing the terms of any determination made by the Minister under Division 3 in connection with the approval.'

After considering a modification request, the Minister for Planning may modify the approval (with or without conditions) or refuse the modification. This assessment has, therefore, been prepared on behalf of the proponent to assess the impacts of the proposed modification (described in detail in Section 2) and request the modification of the existing Project Approval No. 07_0121 (refer to Appendix A).

The proposed modification does not include changes that would warrant additional approvals that were not considered within the EA prepared for the previously approved Project.

1.3.1 Environmental assessment requirements

A request for the proposed modification to the existing Project Approval was submitted to the DoP in correspondence from AquaNet Sydney Pty Ltd dated 18 March 2010. In response, the DoP requested additional information to assess the proposed modification (letter dated 7 April 2010). The main issues identified for investigation in this assessment included:

- traffic and transport
- noise
- flora and fauna
- parklands
- waste generation and management
- soil and water quality
- hazards and risks
- environmental risk analysis
- consultation.

Section 2 of this modification EA outlines the existing approved Project and the proposed modification, while Section 3 outlines the consideration of relevant environmental planning instruments.

Section 4 summarises the assessments for traffic and transport, noise, flora and fauna, waste generation and management, soil and water quality, parklands, hazards and risk and telecommunications. Community and consultation issues are considered in Section 5.

2. Project descriptions and justification

2.1 Description of the approved Project

The approved Project is located approximately 25 km south-west of the Sydney central business district, as shown on Figure 2-1. It traverses four local government areas (Fairfield, Bankstown, Holroyd and Parramatta) and two water catchments — the Parramatta River catchment and the Georges River catchment.

Woodville Road runs through the middle of project area, with Prospect Creek and Burns Creek within the southern part of the existing project area. The Cumberland rail line runs along the south-western edge of approved Project area to the western boundary of the Smithfield industrial area. The north-eastern extremity of the project area is bounded by the Rosehill and Camellia industrial area.

The approved Project currently comprises the following major components:

- a connection to the Liverpool to Ashfield pipeline (LAP) — the source of feed effluent for the recycled water treatment process
- an RWTP, feed effluent storage tank, recycled water storage tank, pumping station and other equipment at North Street, Fairfield (known as the Fairfield RWTP)
- a distribution system, including:
  - an elevated surface reservoir at Woodville Golf Course on Barbers Road, Guildford
  - a surface reservoir and pumping station on the south-eastern corner of Durham Street and Grand Avenue, Rosehill
  - a distribution pipeline approximately 20 km long.

Liverpool to Ashfield pipeline

SWC is commissioning a new 24 km pipeline from Liverpool sewage treatment plant (STP) to an existing sewer at Ashfield (known as the LAP). The LAP will be the backbone of a future recycled water grid and provide off-takes at a number of locations for connection to other recycled water pipelines. Construction of the LAP began in November 2006. Secondary effluent is expected to be available for recycling after August 2010.

When the approved Camellia and Rosehill Recycled Water Project begins operation, the LAP will supply secondary treated effluent to the proposed Fairfield RWTP for processing and then use as recycled water for industrial premises within western Sydney.

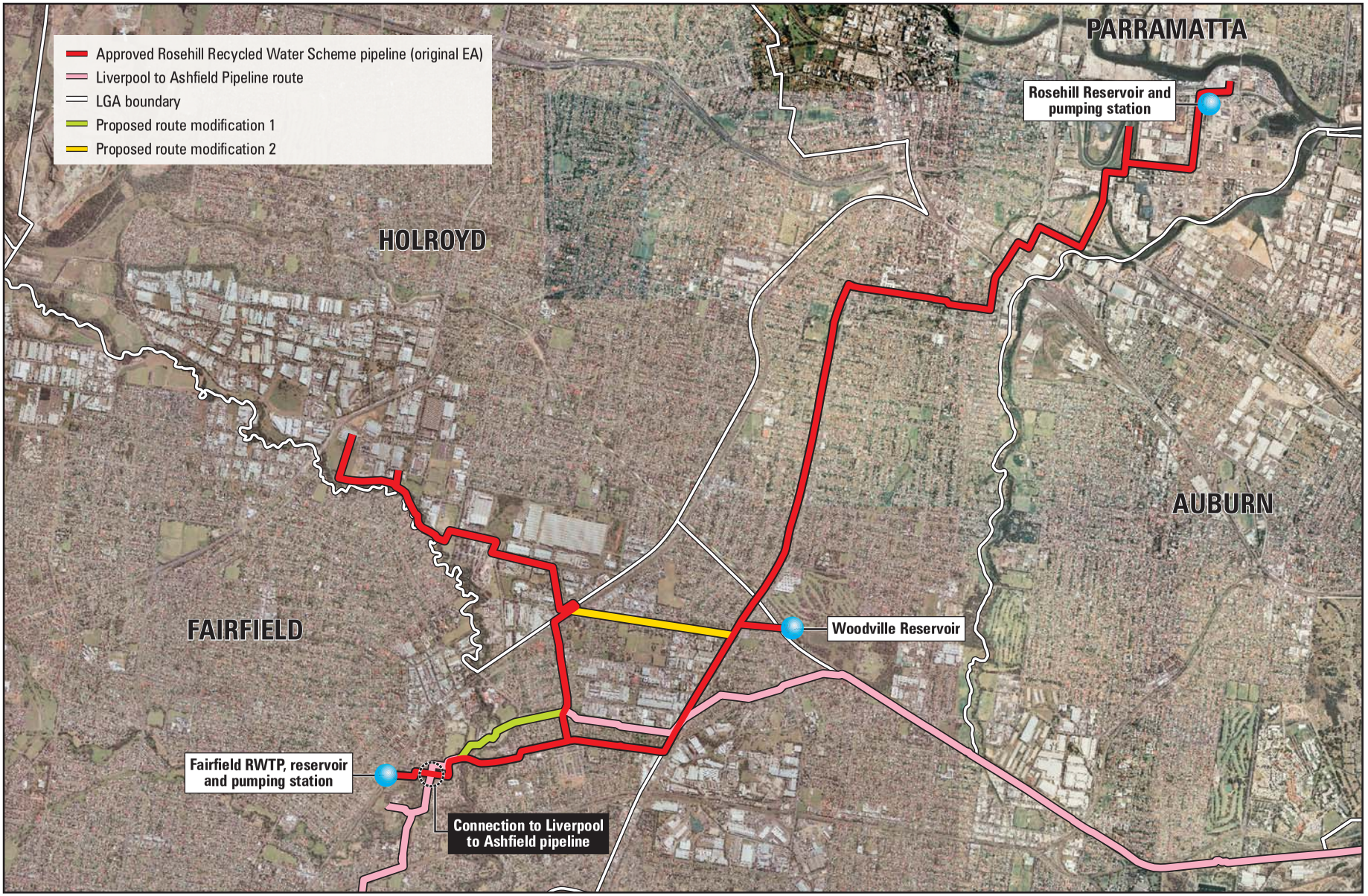

Figure 2-1 **Approved Project overview**

2.2 Modification to the recycled water pipeline along Orchardleigh Street

2.2.1 Description of the proposed modification

The approved Project EA and PPR describe the alignment of the approved recycled water distribution pipeline network between the Fairfield RWTP and the proposed Rosehill Reservoir and pumping station site within the industrial area east of Rosehill racecourse. The initial section of the approved pipeline travels in an easterly direction from the Fairfield RWTP along North Street and McIntosh Street, through Fairfield Park and then traverses east along Gordon Street and Tangerine Street. From here, the pipeline traverses north along Woodville Road before continuing under Woodville Road to Rosehill. This section of approved pipeline travels through a combination of open spaces/parklands, vegetated woodland and urban streets.

The proposed modification adds approximately 1.6 km of pipeline between Railway Parade and Woodville Road along Orchardleigh Street and removes the need for approximately 2.5 km of pipeline no longer required to be constructed along the southern part of the overall scheme along Normanby Street, Tangerine Street and the section of Woodville Road between Tangerine Street and Orchardleigh Street.

The pipeline would vary in diameter between approximately 400 and 450 mm and is consistent with the currently approved pipeline traversing Tangerine Street.

The proposed construction technique of open trenching the modified pipeline route would start at the intersection of Orchardleigh Street and Railway Street. This section of the pipe would connect to the approved pipeline along Railway Street and forms part of the 'Smithfield Spur' section of the overall approved scheme. The pipeline would generally follow the northern side of Orchardleigh Street for the whole length of Orchardleigh Street within the road reservation.

For the connection to Woodville Road, a 'trenchless' technique such as under-boring or horizontal directional drilling would be used. These methods generally involve excavation of a pit on either side of the area to be avoided and excavating a hole through the ground in which pipes are pushed from one side to another. These methods would avoid impacts such as the need to open trench Woodville Road as well as resulting in less noise pollution. The method used will be similar to the connection technique which was approved as part of the original Project EA.

A detailed map is provided as Figure 2-3.

The environmental impact of the modification has been assessed in Section 4 of this report. Photos 2-1 to 2-4 indicate the nature of Orchardleigh Street and the type of land uses within this area.

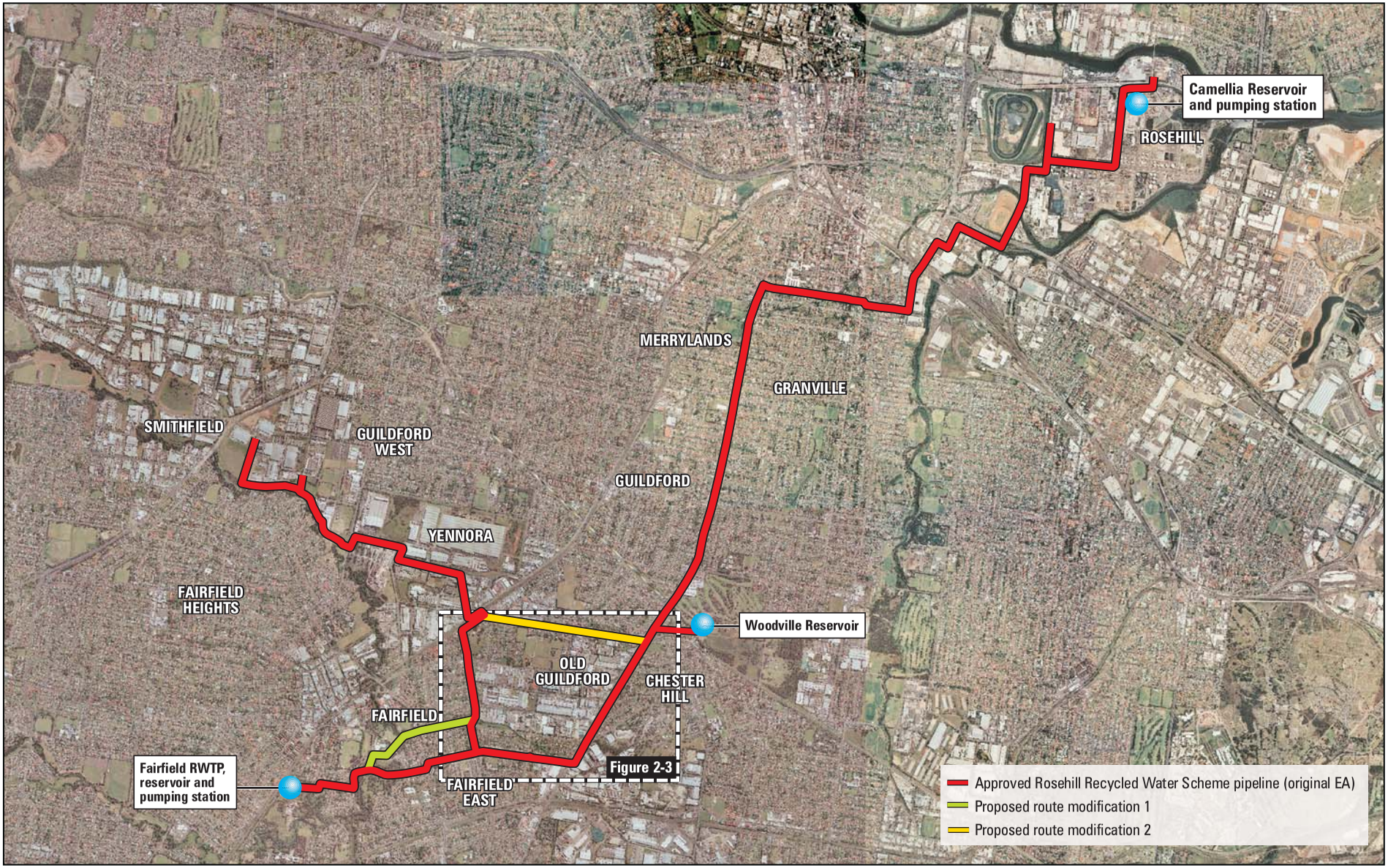

Figure 2-2 **Distribution system overview including modification**

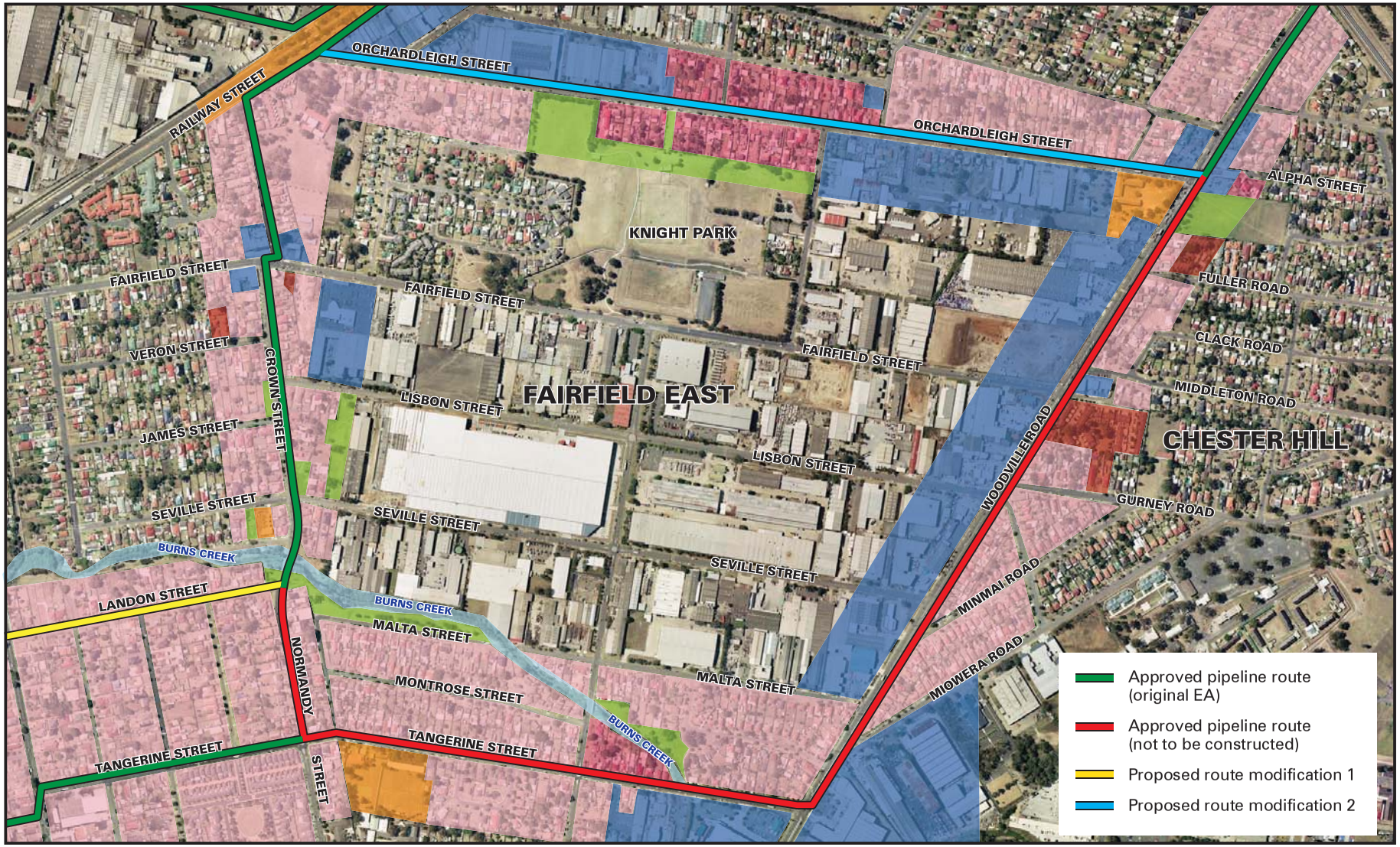

Figure 2-3 **Existing and proposed pipeline detail with existing landuses**

Photo 2-1 Looking south towards Yennora Public School at the intersection of Orchardleigh Street and Railway Street

Source: Parsons Brinckerhoff Australia. March 2010.

Photo 2-2 View of looking east along Orchardleigh Street (from the intersection of Orchardleigh and Matthes Streets)

Source: Parsons Brinckerhoff Australia. March 2010.

Photo 2-3 View of looking east along Orchardleigh Street (from outside Eclipse Engineering Services)

Source: Parsons Brinckerhoff Australia. March 2010.

Photo 2-4 View of looking east along Orchardleigh Street (from outside 106 Orchardleigh Street)

Source: Parsons Brinckerhoff Australia. March 2010.

2.2.2 Land use adjacent to the proposed pipeline route

Within Orchardleigh Street, trenching would occur within the roadway adjacent to a number of land uses prior to connection with the approved pipeline to be constructed along Woodville Road. These land uses include:

- residential dwellings
- commercial and industrial premises including:
  - John Cootes Furniture Warehouse
  - Eclipse Engineering Services
  - two RTA depots (one on either side of Orchardleigh Street)
  - a number of smash repair centres
  - a number of other light industrial unit complexes
- two primary schools:
  - Yennora Public School
  - Old Guilford Public School)
- Guildford Arabic Baptist Church
- Knight Park.

Figure 2-3 identifies the current land uses surrounding the approved pipeline route and the land uses surrounding the route of the proposed realignment along Orchardleigh Street.

2.2.3 Justification and benefits of the modification

The proposed realignment of the approved pipeline would result in a number of benefits including less potential for impacts to vegetation, traffic and residential and commercial premises. The main benefits are discussed below.

Shorter route

The proposed modification adds approximately 1.6 km of pipeline between Railway Parade and Woodville Road along Orchardleigh Street and removes approximately 2.5 km of pipeline no that would no longer be required to be constructed along the southern part of the overall scheme along Normanby Street, Tangerine Street and the section of Woodville Road between Tangerine Street and Orchardleigh Street. This would allow for a reduction in the overall length of the pipeline route by approximately 940 m.

Less resident and business disturbance

The shorter route would have short-term impacts on fewer local residents and business owners during the construction works. The proposed modification would reduce the level of impact on residents and businesses by the approximate amounts in shown Table 2-1:

Table 2-1 Potential disturbance reductions on existing land uses

Land use	Existing (approved) impacts	Proposed modifications
Residential properties	Approximately 155 dwellings	Approximately 100 dwellings
Commercial and industrial properties	Approximately 25-30 large commercial and industrial premises	Approximately 18 small and large commercial and industrial premises

Additionally, the proposed route modification would avoid construction in Tangerine Street and the first 1.3 km of Woodville Road. These streets are important local and regional connector roads that are subject to high volumes of traffic (in particular Woodville Road). Refer to Section 4 and Appendix B.

Shorter timeframe to construct

An additional benefit of reducing the overall length of the pipeline route is the significantly reduced construction timeframe; anticipating that the modified route along Orchardleigh Street can be completed within approximately four to six weeks, which is a significantly shorter timeframe than the existing anticipated construction period for the approved route along Normanby Street, Tangerine Street and Woodville Road. Construction for the approved route is currently anticipated to be in excess of 36 weeks (due to complexities of constructing along Woodville Road).

Additional potential recycled water customers

Discussions to date have been held between Fairfield Council and Jemena for potential use of recycled water for irrigation of the two local parks (Knight and Springfield parks) within the vicinity of Orchardleigh Street. Aligning the proposed pipeline along Orchardleigh Street, the recycled water system could provide recycled water for irrigation of Knight Park (on the southern side of Orchardleigh Street) and Springfield Park (located approximately 150 m to the north of Orchardleigh Street along Junction Street).

This modification would enable additional customers to access the recycled water scheme and reduce the amount of drinking water used for irrigation purposes in the two parks, thus providing a benefit for the wider community.

Photo 2-5 Caltex Service Station located at the intersection of Orchardleigh Street and Woodville Road

Source: Parsons Brinckerhoff Australia. March 2010.

Photo 2-6 John Cootes Furniture Warehouse located on the northern side of Orchardleigh Street (western end)

Source: Parsons Brinckerhoff Australia. March 2010.

Photo 2-7 Two smash repair centres located on the northern side of Orchardleigh Street (western end)

Source: Parsons Brinckerhoff Australia. March 2010.

Photo 2-8 Knight Park located on the southern side of Orchardleigh Street

Source: Parsons Brinckerhoff Australia. March 2010.

Photo 2-9 Alaadin child care centre located on the southern side of Orchardleigh Street (western end)

Source: Parsons Brinckerhoff Australia. March 2010.

Photo 2-10 Typical residential housing located on the northern side of Orchardleigh Street

Source: Parsons Brinckerhoff Australia. March 2010.

2.3 Impact to conditions of approval

The modification proposed would generally result in the need to modify only one of the Conditions of Approval under the existing Project Approval (MP 07_0121) and as modified on 1 April 2010. Specifically, the proposed modification would affect Condition 1.1, which currently states as follows.

'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 Jemena Asset Management and dated 19 March 2009 and supplementary letter to the Department of Planning from Parsons Brinckerhoff Australia Pty Ltd regarding commitments at Woodville reservoir dated 30 March 2010; and

e) the conditions of this approval.'

Condition 1.1 of Project Approval 07_0121 would need to be amended to accommodate the proposed modification as follows:

(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

d) Environmental Assessment of the modification to the Rosehill Recycled Water Project, prepared by Jemena Asset Management and dated 19 March 2009 and supplementary letter to the Department of Planning from Parsons Brinckerhoff Australia Pty Ltd regarding commitments at Woodville reservoir dated 30 March 2010

e) Environmental Assessment of the modification to the Rosehill Recycled Water project, prepared by Parsons Brinckerhoff Australia Pty Ltd and dated May 2010

f) the conditions of this approval.

2.4 Construction methodology

2.4.1 Recycled water pipeline

The proposed construction techniques used for the realigned pipe 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. watercourses, major roadways).

The modified route would be constructed in the same manner as described in the approved Project EA to minimise disruption and impacts to traffic and local residents. The typical installation rates and nominal construction footprints associated with the pipeline construction would be the same as those proposed in the approved Project EA.

The proposed modification to the approved pipeline in Orchardleigh Street would primarily use open trenching. However, where required, stitch boring may also be used as an alternative method of construction to mitigate potential impacts on adjoining land uses (particularly relating to maintaining access to driveways). Additionally, the connection with Woodville Road is likely to use a trenchless technique such as horizontal directional drilling (HDD). These techniques, previously detailed in the approved Project EA, are summarised as follows.

Trenching

Trenching is the preferred technique proposed for the majority of the modified pipeline alignment where there is unlikely to be a 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.

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. Where required, metal plates would be installed across open trenches where driveway access is required to be maintained throughout the construction period of the trench.

Stitch boring

Stitch boring is a less disruptive construction technique that would be used to cross driveways or roadways where access needs to be maintained to properties or side streets during the construction period. This technique would involve excavating small entry and exit pits along the path of the pipe alignment on each side of the driveway(s) whose access is to be maintained. Once the pits are dug, an underground boring process is used and the pipe section(s) are fed into place and connected to the open trenches at each end.

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 connection of the Orchardleigh Street pipe length to Woodville Road would potentially require the use of HDD techniques.

The technique 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 would then be guided by the drill head, which would steer 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.

The launch and retrieval site layouts would be configured to avoid trees (where possible) and other sensitive sites or access areas such as driveways. Both the launch and retrieval sites would be fenced and made secure, with site access control implemented as appropriate. An area is also required to lay out the pipe before it is installed into the borehole. This area would be determined during the set up processes for the connection of the two pipes during the construction process.

2.4.2 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 modification would not result in any modification 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 of Orchardleigh Street. All sealed and paved surfaces would be restored and constructed in accordance with relevant requirements.

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 modification 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.

2.5 Alternatives considered

2.5.1 Pipeline route and construction methods

Detailed investigation of the proposed route along Woodville Road was undertaken using ground penetrating radar analysis. This investigation found that the existing isolated gas pipeline proposed for the recycled water system in the section of Woodville Road over a length of 1.3 km north of Tangerine Street was too close to other existing services. This section of Woodville Road was not feasible for the proposed pipe bursting construction technique, as it would have the potential to disturb services located close to the isolated gas pipeline.

Alternatives considered for installation of the pipeline along the previously approved route include horizontal directional drilling (HDD), as well as open cut trenching, however, given the high traffic volumes on Woodville Road, the time envisaged to undertake this work was considered too long. Diverting the approved pipeline along Orchardleigh Street is considered the most efficient and cost-effective and least disruptive method of providing the connection between the approved sections of pipeline along Railway Street and Woodville Road where underground pipe bursting could commence.

Orchardleigh Street is considered to be the most favourable route due to its relatively quiet traffic volumes and short construction period.

3. Planning and legislative context

3.1 *Environmental Planning and Assessment Act 1979* and Environmental Planning and Assessment Regulation 2000

The EP&A Act and the Environmental Planning and Assessment Regulation 2000 are the main pieces of legislation that control development in NSW. The proponents of all development are required under the EP&A Act to take into consideration the environmental impacts of their development before any construction works. As described in Section 1.3, this modification application is being submitted under section 75W of the EP&A Act, as the existing project approval was obtained under Part 3A.

A range of legislation was considered as part of the approved Project EA prepared in January 2009. This legislation is still applicable to the project and will generally be unaffected by the proposed modification to the existing project approval. The following sections summarise the relevant legislation and its application to the proposed modification.

3.2 Local environmental plan

The modification is located in the Fairfield local government area. The relevant provisions of the local environmental plan (LEP) for this local government area are discussed the following section.

3.2.1 Fairfield Local Environmental Plan 1994

The relevant LEP for the Project is the Fairfield Local Environmental Plan 1994 (Fairfield LEP). Under the Fairfield LEP, 'utility installations' are permissible with consent in all land use zones. The Fairfield LEP defines a utility installation as:

> 'a building or place used by or on behalf of a public authority or any Government Department or in pursuance of any Commonwealth or State Act for the purposes of:
>
> (a) railway, road, water or air transport, or wharf or river undertakings,
>
> (b) the provision of sewerage or drainage services,
>
> (c) the supply of water, hydraulic power, electricity or gas, or
>
> (d) telecommunications facilities.'

The proposed modification is consistent with the definition of a utility installation for the purposes of the Fairfield LEP and is, therefore, permissible with consent in all land use zones in the Fairfield local government area. In addition, the project is consistent with the combined objectives of the land use zones in the Fairfield LEP.

3.3 Owners consent

A network operator's licence has been granted to SPI Rosehill Networks Pty Limited covering construction and operation of the recycled water distribution network and associated facilities. Specifically, the licence gives the holder powers to construct infrastructure within public roads and public reserves. The approved distribution pipeline route and the proposed modification have both been placed in public roads and reserves. In addition, the distribution pipeline would be classified as 'linear infrastructure' in accordance with clause 8F of the Environmental Planning and Assessment Regulation 2000.

Therefore, no landowner consent is required to lodge the request to modify the application.

4. Environmental assessment and mitigation measures

4.1 Summary of environmental impact changes

This section compares the potential impacts of the proposed modification with those of the approved Project. The comparison uses the potential environmental impacts described and assessed in the approved Project EA and PPR and revised assessments of traffic, noise and waste management. Table 4-1 summarises the potential changes in environmental impacts associated with the proposed modification.

Additional details are provided in Sections 4.2 to 4.10.

Table 4-1 Changes to environmental impacts due to the proposed modification

Aspect of impact	Potential environmental impact	Details of impacts
Traffic and transport	The Modification has been proposed to avoid using part of Woodville Road and Tangerine Street which have a range of construction issues that are difficult to ameliorate	Section 4.2
	The modified route would result in a reduced amount of impacts as the approved Project as it will result in a shorter alignment and would reduce the impact on the heavily utilised Woodville Road.	
Noise	The modified construction program has determined that the proposed trenching works may slightly exceed adopted daytime noise goals at the nearest receivers during construction. Appropriate mitigation measures will be put in place during the proposed works.	Section 4.3
Flora and fauna	The modification is located in a highly urbanised landscape. The modification would traverse only roadways within a combined residential/industrial area that generally lack native vegetation or important fauna habitat features.	Section 4.4
	The modification will not require clearing native vegetation that comprises threatened ecological communities or vegetation that provides habitat for threatened flora or fauna species.	
	Some minor trimming of street trees may be required to allow machinery to operate effectively within Orchardleigh Street.	
Land use and parklands	The impacts on the identified land uses would only occur during the construction of the pipeline within Orchardleigh Street. No permanent changes to the land use within the identified project areas would occur. The proposed pipeline would not permanently affect any private property.	Section 4.5
Waste generation and management	The proposed modification is anticipated to generate a slightly smaller amount of waste to the approved Project design scheme due to the reduced length of the pipeline proposed for this modification.	Section 4.6

Aspect of impact	Potential environmental impact	Details of impacts
Soil contamination	Previous assessments of soil contamination within the area of the proposed modification did not identify any soil contamination, acid sulfate soils or groundwater impacts. The proposed modification is unlikely to encounter any areas with potential impacts.	Section 4.7
Water quality	The modified pipeline route would not cross any creeks or other water lines. As with the approved Project, the major impacts on water quality would occur during the pipeline's construction as a result of land disturbance and potential sediment runoff and would be similar to the impacts of the Approved Project.	Section 4.8
Hazards and risk	An updated environmental risk analysis has been prepared. Some positive benefits have been identified, including reduced traffic impacts and reduced vegetation clearing within the project area.	Section 4.9
Environmental risk analysis	An updated environmental risk analysis has been prepared. Some benefits have been identified, including reduced traffic impacts and reduced vegetation clearing within the project area.	Section 4.10
Consultation	Additional consultation has been undertaken throughout the modification environmental assessment process. Consultation with residents along Orchardleigh Street has been undertaken as part of this modification. It is envisaged that the proposed modification would not have a significant effect on resident in the vicinity of the proposed modification works.	Section 5

4.2 Traffic and access

This section summarises the potential impacts of the proposed modification on traffic and transport. The proposed modification has been assessed with reference to the original *Traffic and Transport Impact Study* for the Rosehill Recycled Water project (Technical Paper 1 of the approved Project EA).

PB prepared an additional *Modified Pipeline Route Traffic Impact Assessment* (April 2010) to assess the impact of the proposed modification to the approved Project on traffic and transport. The revised *Traffic Impact Assessment* has been provided as Appendix B.

4.2.1 Summary of approved Project impacts

The approved Project EA and PPR identified and discussed the potential impacts on traffic and access for the whole of the Rosehill Recycled Water project and the associated construction works. It was noted that general traffic impacts would be unavoidable during the pipeline construction due to the necessary construction techniques required for installation. In addition, an increase in heavy vehicle movements relating to the transportation of materials (spoil, construction materials, pipe lengths, plant and machinery) was identified as a cause of increased traffic within the area during construction.

Close to the approved pipeline route, construction impacts on the surrounding transport network and land uses were identified as one of the main impacts from installing the pipeline. These impacts included:

- indirect impacts from truck and plant movements mainly associated with excavating and hauling spoil from trenching and delivery of construction materials resulting in additional traffic generation
- direct impacts from excavation works (such as trenching activities) requiring temporary road and lane closures, restricted property access during work hours and reduced vehicular speeds resulting in traffic congestion
- direct impact along roadways subject to distribution pipeline construction where a temporary loss of kerbside parking would occur
- direct impact on bus services, which would require route modification or re-routing if bus stops are located where road closures would occur during construction. Within the length of the proposed pipeline modification, three bus stops along Tangerine Street could require relocation
- indirect impacts on pedestrians and cyclists
- direct impacts to a number of land uses, including several small businesses and a primary school.

4.2.2 Assessment of modified project impacts

The modification has been proposed to avoid works occurring within Normanby Street, Tangerine Street (western end) and the southern section of Woodville Road, all of which are considered to be reasonably busy roads (in particular Woodville Road). Tangerine Street also has several roundabouts that would make open trench construction more difficult. The impacts of the proposed modification are described below.

Orchardleigh Street / Railway Street intersection

The proposed pipeline on Orchardleigh Street would connect with the approved pipeline alignment at the Railway Street/Orchardleigh Street intersection. The construction of this pipeline connection would be an open trench method and would likely require a partial closure of Railway Street and Orchardleigh Street for a short period of time. Detour routes for vehicular traffic affected by this partial closure could be provided via the local road network to the east of Railway Parade (if required).

To minimise the construction impact on pedestrian and cyclists, consideration would be given to maintaining the existing pedestrian facilities during the construction period. Additionally, some night may be required to be undertaken to minimise the impact of the proposed works at this location. These issues would be detailed in the revised Traffic Management Plan and associated Traffic Control Plans prepared prior to undertaking the proposed works.

Orchardleigh Street from Railway Street to Woodville Road

Both sides of Orchardleigh Street consist of a mix of residential and commercial properties. The street serves approximately 105 houses, 20 commercial properties and two schools. The street has low traffic volumes and a posted speed limit of 50 km/h except adjacent to the schools where a 40 km/h school zone speed limit operates between 8:00 am and 9:30 am and 2:30 pm and 4:00 pm during school days. This street is approximately 14 metres wide with a three metre wide grass verge either side of the carriageway.

The pipeline would be installed, on the southern side of the street between Railway Street and Woodville Road. The construction would use the open trench method and require a work space approximately five metres wide and up to 100 metres in length. This work site could be provided by using the parking lane on the southern side while maintaining two three-metre wide traffic lanes and the parking lane on the northern side.

The majority of properties on Orchardleigh Street have off-street parking so on-street parking spaces are available on both sides of the street for the majority of its length. Any vehicles temporarily displaced by the construction works in this street are likely to be able to find parking spaces elsewhere in the street. Accesses to all properties would be maintained at all times by using road plates (where required).

The pipeline will need to pass intersections with side roads off Orchardleigh Street at Matthes Street and Donald Street. At these intersections the pipeline will need to be constructed in to two sections so that a minimum road width of 3.5 metres is maintained. Traffic control will be required at each of these intersections and will need to be detailed within Traffic Control Plans. The pipeline crossing at the Orchardleigh Street / Donald Street intersection will also need to consider providing for bus movements into and out of this street.

Construction activity along Orchardleigh Street would consider the bus stop and zebra crossing located approximately 50 metres west of Church Street. These facilities would be maintained during the construction period to minimise impact on bus users and pedestrians.

4.2.3 Mitigation and management measures

Several impacts on traffic and transport have been identified as a result of the modified recycled water pipeline route. However, many of these impacts are similar to those predicted for the original pipeline route. Management and mitigation measures were identified in the approved Project EA and are generally considered to be appropriate in the context of the proposed modification.

In addition, all impacts would be temporary and would only occur during construction. A summary of the temporary construction impacts and mitigation measures is provided below. A more detailed discussion of the mitigation and control measures is provided in the revised *Modified Pipeline Route Traffic Impact Assessment* (refer Appendix B):

- the construction will require the partial closure of both Railway Street and Orchardleigh Street. The extent of the partial closure will be minimised by the design of the pipeline alignment at this location. Detour routes can be provided via residential streets to the east of the Railway Street and would be detailed within Traffic Control Plans as part of the Traffic Management Plan

- the preferred route for heavy vehicles would be via Woodville Road and Orchardleigh Street so increased heavy vehicles due to construction should be minimal and would not have an impact

- where access cannot be maintained, steel road plates will be available for use to bridge the open trenches and to provide temporary access. Barriers will also be available for use during the construction of the pipeline past the signalised pedestrian crossings on Railway Street and Orchardleigh Street. This will minimise the impact on pedestrians at these crossings

- the pipeline will be constructed progressively in sections and, where practical; these sections will avoid blocking vehicle access to the properties

- the times of deliveries and removal of spoil from the site would be managed to avoid the traffic peak hours and school start and finish times

- vehicles parked within this road section would need to be temporarily relocated to other parts of Orchardleigh Street where construction is not taking place. Some spaces are available elsewhere in Orchardleigh Street

- where the pipe line passes side roads at Matthes Street and Donald Street site specific Traffic management Plans will be prepared. The pipeline will be constructed in two sections so that a minimum road width of 3.5m is maintained to allow traffic access to be maintained without the need for a detour

- public buses operate with a half hour frequency between approximately 6:00 am and 7:00 pm on Orchardleigh Street between Woodville Road and Donald Street. The construction of the pipeline past this intersection will need to minimise impacts on bus operations.

4.3 Noise

This section summarises the impacts of the proposed modification to the existing approved noise criteria established in the approved Project EA.

4.3.1 Summary of approved project impacts

The approved Project EA included noise and vibration modelling results and an assessment of the potential impacts associated with the whole of the Rosehill Recycled Water project. The likely impacts of the Project were assessed through the preparation of a *Noise and Vibration Impact Assessment* (NVIA – Technical Paper 2 of the approved Project EA). A *Revised Noise and Vibration Impact Assessment* has been prepared by PB (March 2010) to assess the impact of the proposed modification to the approved Project with respect to noise and vibration. The revised Noise and Vibration Impact Assessment has been attached as Appendix C of this report.

A prediction of the received noise levels for the excavation construction activity was included in the approved Project EA. Predicted noise levels identified were indicative of construction works close to the nearest potentially affected receptors along the pipeline route, based on the proposed construction techniques for each section of the identified route. This included using saw cutting equipment for initial concrete and asphalt cutting, plant and machinery used for trenching and the impact of other construction techniques, such as HDD and thrust boring.

Noise levels from excavation works, inclusive of saw cutting operations, were generally predicted to be up to slightly above the dB(A) compliance levels at various receptors along the route of the project. Where the saw cutter was not to be in operation, reductions in received noise levels were predicted.

The approved Project EA also noted that a reduction in received noise levels may be experienced where works take place over a period of a few days to one week, depending on site-specific conditions and based on the projected pipeline laying rate. Peak noise levels, such as those predicted, were most likely to occur on one day/night only, where works were directly adjacent to the receiver. The predicted exceedances were not expected to occur at any one location for the duration of the works.

4.3.2 Assessment of modified project impacts

It has been assumed for this assessment that the proposed modification would not require a variation in methodology for open trenching construction works as assessed in the NVIA. The road surface breaking works to prepare the trench are the dominant noise generating activity where a saw cutter, 20 tonne excavator and road truck would operate intermittently, typically for the first hour of each day.

Upon completion of the road surface works, the trench would be excavated, the pipe section installed and the trench back filled using the excavator. The road surface would then be reinstated using asphalt and a compactor and road truck. Table 4-2 details construction plant source sound power levels (SWL) adopted in the predictive assessment.

Table 4-2 Adopted construction plant source noise levels

Construction works	Adopted source SWL, dB(A)
Road surface works	
Saw cutter	108
Excavator	95
Road truck	108
Trenching and pipe installation	
Excavator	95
Road truck	108
Road reinstatement	
Compactor	96
Excavator	95
Road truck	108

Note: all noise levels in dB(A) to nearest dB(A)

Predicted worst case construction noise impacts for the modified pipeline alignment at nearest receiver locations are detailed in Table 4-3. The range of predicted noise impacts is indicative of peak noise generating works undertaken in proximity to receivers where all feasible construction plant is operational. Reduction in received noise levels would be achieved where fewer plant are in simultaneous operation and where works are carried out at greater separation distance to receivers.

For the assessment of internal noise impact at education institutions, the Alaadin childcare centre and Guildford Arabic Baptist Church, a 10 dB(A) reduction to predicted external noise impacts has been applied indicative of the threshold for noise reduction performance afforded where windows are open for ventilation.

Noise management and mitigation measures to reduce anticipated construction noise impacts and minimise potential for annoyance at nearest receivers are included in Section 4.3.3.

Table 4-3 Predicted day time construction noise impacts for proposed modified pipeline route

Location	Separation distance (m)	Construction noise level $L_{Aeq, 15min}$			Noise goal $L_{Aeq, 15min}$	Compliance		
		Road surface works	Trenching & installation	Road reinstatement		Road surface breaking	Trenching & installation	Road reinstatement
Residential dwellings	12–20	74–79	61–66	71–76	54	+ 20–25	+ 7–12	+ 17–22
Commercial premises	20–30	71–74	58–61	68–71	70	+ 1–4	Yes	+ 1
Yennora Public School	50	66	53	63	45 (internal)	+ 10	Yes	+ 8
Old Guildford Public School	50	66	53	63	45 (internal)	+ 10	Yes	+ 8
'Alaadin' childcare centre	20	74	61	71	45 (internal)	+ 19	+ 6	+ 16
Guildford Arabic Baptist Church	50	66	53	63	45 (internal)	+ 10	Yes	+ 8
Knight Park	30	71	58	68	60	+ 11	Yes	+ 8

Note: all noise levels in dB(A) to nearest dB(A).

L_{Aeq} = Equivalent continuous (energy average) A-weighted sound pressure level, defined as the steady sound level that contains the same amount of acoustic energy as the corresponding time-varying sound

4.3.3 Mitigation and management measures

Consistent with the predicted noise impacts, a series of pre-construction and construction phase measures and management practices designed to mitigate and reduce noise levels are detailed in the NVIA. Measures include the development of a construction noise and vibration management plan (CNVMP) to address noise levels associated with the construction works, maximising offset distance between noise generating plant and sensitive receivers and avoiding simultaneous operation of dominant noise generating plant.

The measures relevant to the works associated with the proposed modification are summarised below.

Pre-construction noise and vibration level management:

- Formulate construction noise management measures as part of the revised construction environmental management (CEMP) plan to provide a framework for addressing noise levels associated with construction works.
- Adopt best management practice and best available technology economically achievable practices, as encouraged by the Department of Environment, Climate Change and Water (DECCW), and as addressed in current acoustic guidelines.
- Maximise the offset distance between noisy plant items and sensitive receivers and orient equipment away from sensitive receivers.
- Avoid, where practical, simultaneous use of noisy plant and use of noisy plant adjacent to sensitive receivers.
- Provide information to potentially affected local residents before noisy activities begin. Construction methods, duration and timing of events would be outlined during this process.
- Display appropriate signs at temporary and permanent construction sites, including project details and relevant contact details for public information and enquiry.
- Schedule construction to take advantage of periods, such as school holidays and weekends, wherever practicable.

Construction noise and vibration level management

The application of standard construction noise mitigation techniques would be required, as a minimum, to include the following measures:

- Use of residential class mufflers, and where applicable, engine shrouds (acoustic lining). Maintain all equipment in good order, including mufflers, enclosures and bearings to ensure unnecessary noise emissions are eliminated.
- Ensure construction activities are in accordance with Australian Standard AS 2436-1981 *Guide to Noise Control on Construction, Maintenance and Demolition Sites* and that all equipment used on site demonstrates compliance with the noise levels recommended in AS 2436-1981.

- Appropriate use of all plant and equipment, with reasonable work practices applied, including no extended periods of 'revving', idling or 'warming up' near existing residential receivers. Schedule any excessively loud activities for periods of the day when general ambient noise levels are greatest.

- Do not start engines and on-site activities (including entry or departure from the site) outside of the specified construction hours.

- Undertake regular maintenance on all plant and machinery used throughout the constructions works.

Further to the above recommendations, the following management and mitigation measures are recommended considerate of the noise sensitive receivers on Orchardleigh Road:

- Construction works should be where feasible, undertaken during day time standard hours of construction only. To reduce duration of noise generating activity and minimise potential noise impacts construction activity outside of standard construction hours may be undertaken adjacent to nearest noise sensitive schools and churches subject to Council and DoP approval

- In consultation with Yennora Public School and Old Guildford Public School, construction works should be scheduled, where feasible, during school holidays and outside of examination periods. Where construction works are to occur during normal school hours, saw cutting works, as the dominant noise generating activity should be scheduled outside of teaching hours, such as during lunchtime breaks and after 3 pm.

  In addition to the above mitigation measures proposed, permission to undertake work on weekends is also sought as part of this application. Allowing work to occur outside of normal construction hours will significantly reduce the impacts of the proposed work on the two identified sensitive school receivers.

4.4 Flora and fauna

This section summarises the impacts of the proposed modification to the existing biodiversity impacts assessed within the approved Project EA. The approved Project EA included a biodiversity survey and assessment of the potential terrestrial biodiversity impacts associated with the whole of the Rosehill Recycled Water project area. The proposed impacts of the Project were assessed through the preparation of a *Biodiversity Assessment* (Technical Paper 3 of the approved Project EA).

An assessment of the potential impacts on biodiversity as a result of the proposed modification is provided below.

4.4.1 Summary of approved Project impacts

The biodiversity survey and assessment for the approved Project EA previously identified biodiversity values (remnant vegetation communities, native flora or fauna habitat, drainage lines and threatened species) throughout various locations of the entire project study area.

The construction area of pipeline that would be affected by this modification is only roadway within a combined residential and industrial area that exhibits a lack of native vegetation or important habitat features (refer to Photo 4-1).

Photo 4-1 Examples of the type of vegetation along the northern side of Orchardleigh Street

Source: Parsons Brinckerhoff Australia. March 2010.

4.4.2 Assessment of modified project impacts

The proposed recycled water pipeline modification represents a minor diversion from the original route of the approved pipeline and is anticipated to have a minimal impact on any flora or fauna within the vicinity of the modification. The pipeline is proposed to be constructed wholly within the roadway reserve of Orchardleigh Street and would not disturb any native species.

Of importance to the proposed modification, the modified route would reduce potential environmental impacts on flora and fauna by avoiding the previously approved creek crossing of Burns Creek along Tangerine Street.

Overall, very limited flora, fauna or suitable fauna habitats are considered to be present within the area of the Project along Orchardleigh Street. In addition, as the proposed works are to occur wholly within the road reserve, it is not anticipated that the proposed works would have a significant impact on any flora or fauna within the local area. Notwithstanding this, trimming of some street trees may need to occur to allow for the efficient movement of trenching machinery along the street.

Some minor trimming of street trees may be required to allow machinery to operate effectively within Orchardleigh Street, however, this impact is anticipated to be minimal.

4.4.3 Threatened species

The approved Project EA identified the threatened species that had been recorded in the locality. A review of the threatened species records for the locality found the following:

- 34 species of plant listed under the TSC Act and/or the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- 49 species of animal listed under the TSC Act and/or the EPBC Act.

Of the threatened plant species, suitable habitat was identified in the approved Project EA for three species within the study area — *Marsdenia viridiflora spp viridiflora, Acacia pubescens* and *Pimelea spicata*. Potential habitat for these species was considered to occur within three locations of the overall Project area.

The only threatened species recorded in the study area during the surveys for the approved Project EA were microchiropteran bat species. The three threatened species recorded were: Eastern False Pipistrelle, Greater Broad-nosed Bat, and Large-footed Myotis (possible identification to species level only). Nine threatened species of animal were also considered likely to occur in the study area based on the presence of suitable habitat, among them seven species of microbat (including the three species recorded during the field survey), the Green and Golden Bell Frog and Cumberland Plain Land Snail.

As the proposed works are to occur wholly within the road reserve, it is not anticipated that the proposed works would have any impact on potential threatened species that may occur within Orchardleigh Street. The significance assessments for the previously identified threatened flora and fauna species were made as part of the approved Project EA and are not considered to require updating as a result of the proposed modification.

4.4.4 Threatened ecological communities

The approved Project EA identified the following threatened ecological communities listed under the TSC Act as present within the study area —River-Flat Eucalypt Forest; Cumberland Plain Woodland, Shale Gravel Transition Forest and Castlereagh Swamp Woodland. Cumberland Plain Woodland was the only threatened ecological community recorded in the study area listed under the EPBC Act. The proposed works would occur wholly within the road reserve. It is, therefore, not anticipated that the proposed works would have any impact on potential threatened ecological communities that may occur within Orchardleigh Street.

4.4.5 Migratory species

In the approved Project EA, 20 migratory species were predicted to occur in the locality, of these 20, 11 were listed threatened species under the TSC Act and/or EPBC Act. A review of migratory species records from the locality did not result in any changes.

4.4.6 Assessment of significance of impacts

Projects assessed under Part 3A of the EP&A Act require assessments of significance against the heads of consideration detailed in the draft *Guidelines for Threatened Species Assessment.* The significance assessments completed for the approved Project EA are considered to still be applicable in the context of the modified project as the route does not involve extensive vegetation removal or removal of preferred habitats for threatened species.

4.4.7 Mitigation and management measures

The project would be located in a highly modified landscape. The whole of the project would traverse along and within a single road, which currently contains a combination of residential, commercial and industrial uses in addition to two schools. The site lacks any significant native vegetation or important habitat features. The potential impacts of the project on local flora and fauna have been avoided through the route selection process. As such, potential impacts to areas of high conservation value, local populations of species, populations and ecological communities due to construction and operation of the project have been avoided.

To further minimise and mitigate potential impacts on the ecological values of the site during construction, a number of mitigation measures were provided within the Draft Statement of Commitments for the Project. The commitments made within this Statement of Commitments are still considered to be relevant to the proposed modification.

No matters of national environmental significance under the EPBC Act were identified in the study area that would be directly affected by the modified Project.

4.5 Land use and parklands

The proposed modification to the approved Project is expected to have some minor, temporary impacts on the existing land uses that have been identified along the route of the proposed modification. In particular, the proposed realignment of the recycled water pipeline route along Orchardleigh Street may have some minor impacts on the existing residential and business uses within the street. These impacts are described below.

4.5.1 Summary of approved project impacts

The section of the approved pipeline to be realigned is located within the suburbs of Fairfield and Old Guildford within the Fairfield local government area. The land uses along this section of pipeline are mainly residential with some commercial, industrial and a public school. The currently approved Project route would affect the following land uses:

- residential properties along Normanby Street, Tangerine Street and Woodville Road
- commercial and industrial premises, predominantly along Woodville Road with some additional industrial unit sites along the western end of Tangerine Street at the intersection of Tangerine Street and Woodville Road
- Villawood North Public School.

4.5.2 Assessment of modified project impacts

The proposed modification traverses a combination of residential and commercial and industrial premises, although all construction works will ultimately occur within the road reserve of Orchardleigh Street. The proposed realignment of the approved pipeline would allow for an overall reduced impact on land uses within the local area. Figure 2-3 identifies the current land uses in the vicinity of the approved and proposed recycled water pipeline alignments. The change in impact on adjacent land uses is predicted as follows.

Residential properties:

- Residential properties along Orchardleigh Street would be affected instead of those along Gordon Street, the Horsley Drive and the western part of Tangerine Street. The number of residential properties disturbed by the pipeline would be reduced.

Commercial and industrial properties:

- A reduced number of commercial and industrial premises would be affected by the proposed route alignment, particularly towards the western end of Tangerine Street and along Woodville Road.

Open space:

- The impact on the open space/recreation uses within the vicinity of the proposed modification would be minimal. The realignment of the proposed pipeline would follow existing internal roadways, and therefore, would not impact on any parkland areas. The proposed modification is considered to provide a net benefit to local open space areas including Knight Park and Springfield Park by providing the opportunity for use of recycled water for irrigation purposes.

Schools:

- The realignment of the pipeline would result in reduced disruption to the existing school on Tangerine Street. However, two additional schools are located along the proposed route (both of which would have been impacted by the previously approved Project). The expected impact on these sites is anticipated to be minimal through the use of appropriate mitigation measures outlined in Section 4.5.3.

4.5.3 Mitigation and management measures

The impacts on the identified land uses would only occur during the construction of the pipeline within Orchardleigh Street. No permanent changes to the land use within the identified Project areas would occur. The proposed pipeline would not permanently affect any private property.

Overall, the proposed refinement to the route of the pipeline would reduce the length of the pipeline by approximately 940 m. This would, therefore, reduce the potential impact of the Project on existing land uses. Both the number of residential land uses and commercial industrial premises would be reduced.

Jemena has, and will continue to, consult with affected stakeholders (refer Section 5) about the potential impacts during the construction and operation phases of the project. Before construction begins, consultation with affected landholders would continue as part of ongoing notification.

Where possible, the proposed works that would occur outside of each of the schools would be undertaken during school holidays or on Saturday mornings as approved by the existing hours of permissible construction specified in the current Conditions of Approval.

4.6 Soil and waste management

The potential impacts associated with the proposed modification are expected to be minimal due to historical land use. The potential impacts are described below.

4.6.1 Summary of approved project impacts

With regard to the proposed modification, as outlined in the major Project Approval (Project Approval 07_0121, dated 1 June 2009), this modification is proposed to involve trenching, which is anticipated to produce excess soil and water requiring management and/or disposal.

Items of consideration for waste management include potential for waste soil and water in addition to potential acid sulfate risk as shown below.

4.6.2 Assessment of modified project impacts

There is some potential for soil and groundwater contamination to existing along this proposed route, however, further investigation, including chemical analysis, would be required to determine the level of impact, if any.

Waste soil and water

Any construction waste materials (solid and/or liquid) to be disposed off site would be assessed against the DECCW (2009) *Waste Classification Guidelines*. Waste water disposal would likely require assessment to allow for discharge to sewer or approved stormwater.

Acid sulfate soils

While some potential acid sulfate soils may be present in underlying shales, the Acid Sulfate Soil Risk Map from the CSIRO Australian Soil Resource Information System (ASRIS) indicates a low probability of acid sulfate soils in the study area (http://www.asris.csiro.au/index_ie.html accessed on 15 March 2010).

The potential for presence of acid sulfate soil material is addressed further in Section 4.7.

4.6.3 Mitigation and management measures

Proposed mitigation measures for waste soils and water include:

- The CEMP should include contingency measures (including for unknown contaminants) to allow for further investigation and treatment/disposal as appropriate. Wastes produced during excavation works will require classification prior to their disposal offsite to a licensed waste facility.
- CEMP to include measures for fuel management and spills/leaks. Ensure spill kits are available during site works.

Proposed mitigation measures for acid sulfate soils include:

- Prepare an Acid Sulfate Soil Management Plan before the trench excavation works begin in the unlikely case that acid sulfate soils are encountered.
- Base the management plan on the acid sulfate soil mitigation principles set out in the ASSMAC Management Guidelines (1998), and use the plan as a framework for the ongoing management and monitoring of impacts throughout the construction and operation phases of the project. If mottled clay soil profile is found, use the Acid Sulfate Soil Management Plan to mitigate any potential risks.

4.7 Soil contamination

4.7.1 Summary of approved project impacts

Current and former land uses within the approved Project footprint have previously been assessed for the presence of contaminated soils. These studies identified potentially contaminated soils within the industrial areas of Granville, Rosehill and Camellia.

Recycled water pipeline

A number of studies and investigations for soil contamination along the route of the proposed pipeline (refer Douglas Partners, 2007 and PB, 2008 — reference within the approved Project EA) were part of the previous assessment of the Project. Groundwater and acid sulfate soils were assessed along the distribution pipeline route.

The assessment identified that groundwater was not encountered during any of the excavations along the proposed trenched alignment. The assessment found some indication of acid sulfate soils below ground level along Berry Street (Granville) to Thackeray Street (Camellia) in an area that would be disturbed by construction activities. No other potential or actual acid sulfate soils were identified across the project area during preliminary soil investigations.

4.7.2 Assessment of modified project impacts

The proposed modification would involve trenching below ground level along the new alignment.

The proposed alignment modification traverses through mostly residential areas approaching some commercial and industrial premises on the eastern and western ends of Orchardleigh Street, Fairfield. Some of the various commercial and industrial uses at these premises include:

- vehicle repair centres
- service stations
- engineering works
- car dealerships.

Historical aerial photos from 1943 reveal this street to be primarily agricultural based.

Potential impact to soil and groundwater may exist along Orchardleigh Street due to current and past industrial activities in the area, particularly from heavy metals, and hydrocarbons. Pesticides may also be present in the residual soil as a result of past agricultural activities, but is considered a low risk.

There is also the potential for soil impact to occur along roadway edges from traffic emissions, spills and leaks, and imported fill, particularly heavy metals (lead), hydrocarbons and asbestos.

Previous investigations in this area conducted by Douglas Partners (Douglas 2007) analysed soil samples along the proposed route near the intersection of Orchardleigh Street and Railway Street. Two locations were investigated near this intersection. Analysis of the soil at these locations found the fill material in these locations to be classified as inert material (general solid waste). The natural materials in these locations were not analysed during the Douglas Partners investigation.

4.7.3 Mitigation and management measures

The approved Project EA outlined a number of mitigation and management measures relating to appropriate treatment/disposal options of soils before and during construction. These measures are specified within the CEMP and waste management sub-plans and focus on issues such as spoil management and contamination. It is considered that these measures would continue to be suitable to mitigate any potential impacts of the proposed modification.

4.8 Water quality

4.8.1 Summary of approved project impacts

The approved Project has the potential to indirectly affect a number of waterways, including Prospect Creek, Burns Creek, Duck Creek, Duck River and Parramatta River during construction, with operational impacts potentially affecting St Elmo's Drain. However, as a result of the proposed modification, only Prospect Creek and Burns Creek may potentially be disturbed as a result of the modified project.

4.8.2 Assessment of modified project impacts

The modified pipeline route would result in the removal of one of the creek crossings of Burns Creek (along Tangerine Street). Despite this, water quality impacts may occur during the pipeline's construction as a result of land disturbance and potential sediment runoff. Spoil from trenching works may affect the quality of local waterways if not properly managed and allowed to run off into adjacent stormwater drains.

The approved Project EA provided a range of mitigation measures to be applied during the construction phase of the project to manage any significant impacts on waterways within the project footprint. These mitigation measures are still considered to be appropriate for the modified project and are summarised below.

The proposed modification is also unlikely to have any effect on water quality during operation and maintenance given the underground, sealed nature of the proposed works.

4.8.3 Mitigation and management measures

It is expected that water quality during construction of the modification could be managed adequately through the application of standard management measures, which would include:

- update the soil and water management sub-plan as part of the existing CEMP
- install, maintain and manage erosion and sedimentation controls before and during construction in accordance with a soil and water management sub-plan and the principles in *Managing Urban Stormwater – Soils and Construction* (Landcom 2004)
- manage trench dewatering in such a way as to prevent material pollution of adjacent watercourses and the stormwater system. Any dewatering of excavated areas would be controlled and appropriately treated before off-site discharge or disposal. Any sediment-laden trench water would also be treated before off-site discharge or disposal
- divert surface runoff away from disturbed areas at facility locations wherever practicable
- plan construction works to minimise the length of time soils are disturbed

- restrict construction traffic in unsealed areas. Such traffic would be minimised and, where required, wheel cleaning areas would operate at locations where vehicles leave the construction site
- keep volumes of fuel, chemicals or other potentially polluting liquids stored at construction sites to minimum practical volumes. Fuels, chemicals and other liquids would be contained appropriately as the work site progressively moves along Orchardleigh Street to ensure that any accidental spills are contained
- provide spill containment kits at construction sites to reduce the risk of an accidental spill migrating off-site
- prepare erosion and sediment control sub plans for specific work areas according to the Landcom (2004) guidelines.

4.9 Hazards and risk assessment

4.9.1 Summary of approved project impacts

Part of the approved Project EA included identifying all credible hazards to the project. This involved identifying all activities that would be part of the Fairfield RWTP and pipeline operations, the materials associated with each activity, and the hazard that might arise from these activities and materials. Activities identified included:

- transport of equipment and materials to site
- storage on-site
- equipment maintenance
- waste disposal
- transport of other material (including waste) off-site.

Classes of materials that might give rise to or be involved in hazardous incidents and that might be present on the site are:

- water treatment chemicals
- lubricants, solvents, and other flammable or combustible materials
- wastes (sludges, waste chemicals, backwash waters, etc).

A qualitative preliminary operational risk assessment was prepared as part of the approved project EA. An analysis of the risk associated with potential chemicals spills was included in this assessment. The results of the analysis found no hazards with an ‘extreme’ risk or ‘high’ risk. All other risks were assessed as moderate or low, with consideration of the standard handling and storage controls and procedures that would be installed/applied at the site.

4.9.2 Assessment of modified project impacts

The approved Project EA provided a range of mitigation measures to be applied during the Project’s construction phase to manage any significant impacts on waterways within the Project footprint. These mitigation measures are still considered to be appropriate for the modified Project and are summarised below.

Additionally, as described in Section 4.8, the proposed modification is unlikely to have any effects on water quality during operation and maintenance.

4.9.3 Mitigation and management measures

The approved Project EA provided for a number of mitigation measures relating to appropriate management of hazards and identified risks before and during construction as well as during the proposed system’s operation. These measures are specified within the CEMP and waste management sub-plan. It is considered these measures would continue to be suitable to mitigate any potential impacts of the proposed modification.

4.10 Environmental assessment risk analysis (revised)

During the preparation of the approved Project EA, an environmental risk analysis was used to assess and identify the project's potential environmental risks.

The environmental risk analysis is presented in Table 4-5. This table has been updated as part of the assessment of the proposed modification to identify any additional key environmental issues that may relate to the project. The same criteria used for the original environmental risk analysis have been used to reassess the impacts (refer Table 4-4).

Table 4-4 Risk category descriptions

Risk category	Description
A	May have a medium to high level impact. Investigations are required to determine the level of potential impact and to identify appropriate measures to manage the effects.
B	May have a low to medium level of impact. However, the environmental impacts can be reduced to an acceptable level through the use of standard or identified management measures.
C	Would have a low level impact manageable through the use of standard measures.

Table 4-5 Environmental risk analysis

Aspect	Impact	Comment (from approved Project EA risk analysis)	Residual risk ranking (from approved EA)	Potential impacts of proposed modification	Revised risk ranking (proposed modification)
Flora and fauna					
Clearing of vegetation	Reduction in flora diversity Reduction in fauna habitat	Limited vegetation clearing required for implementation of project.	C	Reduced level of impacts predicted as a result of the reduced route length resulting from the modification.	C (Positive)
Aquatic ecology					
Chemical spills, loss of containment	Reduction in water quality	Refer surface water quality.	Refer surface water quality	No change in the level of impacts predicted as a result of the modification.	Refer surface water quality
Direct disturbance	Reduction in water quality Destruction of aquatic habitats				
Aboriginal heritage					
Works in an area of potential sensitivity	Impact on sensitive sites/ unidentified areas Impact on cultural sensitivity	Single artefact discovery along alignment. Jemena, on behalf of AquaNet, has commissioned additional studies, including consultation with relevant Aboriginal groups in accordance with DECCW guidelines.	B	No change in the level of impacts predicted as a result of the modification.	B
European heritage					
Works in an area of potential sensitivity	Impact on sensitive sites	Project worksites located in highly disturbed/modified environments. Other locations are cleared with no visible structures.	C	One heritage item has been identified within the vicinity of the proposed works. The church and trees located at the corner of Orchardleigh and Broughton Streets are considered to be a local heritage item under the Fairfield LEP. The proposed works would not impact the heritage significance of this site.	C

Aspect	Impact	Comment (from approved Project EA risk analysis)	Residual risk ranking (from approved EA)	Potential impacts of proposed modification	Revised risk ranking (proposed modification)
Surface water quality/flooding					
Structures on flood plain	Impacts on flood levels/ hydraulics of watercourses	No infrastructure in creeks. RWTP above 1 in 100 year flood level. No impacts expected.	C	No change in the level of impacts predicted as a result of the modification.	C
Discharges from the network	Impact on water quality	All but two scour points discharge to sewer, the other two discharge to grass surfaces and playing fields at Smithfield and Woodville Golf Course. Recycled water is of high quality and would pose minimal risk to water quality in any adjacent waterways.	C	No change in the level of impacts predicted as a result of the modification.	C
Disturbance to soils through construction	Possible disturbance to potential acid sulfate soils Rainwater may result in erosion and dissolved solids in runoff	Some potential/actual acid sulfate soils have been identified at depth from Clyde through to Camellia. Control procedures would be used to minimise trench depths along this section and deal with any disturbed potential/actual acid sulfate soils disturbed. Standard erosion control measures would be used to manage impacts.	C	No change in the level of impacts predicted as a result of the modification.	C
Groundwater					
Interaction/ contamination of groundwater	Discharge of pollution to groundwater	Contingency plan for accidental spills as part of Draft Statement of Commitments. Standard erosion and sedimentation controls would be used at construction worksites. Preliminary investigations did not identify high groundwater tables across project areas.	C	No change in the level of impacts predicted as a result of the modification	C
	Groundwater lowering	Minimal and isolated trench/excavation dewatering would take place for distribution pipeline. Excavations would not typically be more than 2 m deep. Some minor dewatering may be required at Rosehill reservoir and pumping station site.	C	No change in the level of impacts predicted as a result of the modification	C

Aspect	Impact	Comment (from approved Project EA risk analysis)	Residual risk ranking (from approved EA)	Potential impacts of proposed modification	Revised risk ranking (proposed modification)
Air quality including odour					
Disturbance of soils	Reduction in air quality, loss of amenity	Standard controls would be used at construction worksites.	C	Reduced level of impacts predicted as a result of the shorter route length resulting from the modification, therefore, reducing construction time and extent of potential of impacts.	C (Positive)
Emissions from plant and trucks	Reduction in air quality, loss of amenity	Standard controls would be used at construction worksites.	C	Reduced level of impacts predicted as a result of the reduced route length resulting from the modification, therefore, reducing construction time and extent of potential of impacts.	C (Positive)
Odour during operation	Emissions from air valves or fixed installations	The distribution pipeline would be charged at all times except for maintenance periods. The recycled water has had impurities removed and would not result in odour releases. The waste stream at the RWTP would be piped directly to the sewer, hence no odour is expected. Reservoirs would be covered.	C	Reduced level of impacts predicted as a result of the shorter route length resulting from the modification, therefore, reducing construction time and extent of potential of impacts.	C (Positive)
Noise and vibration					
Noise emissions from construction plant	Loss of amenity for residents	Construction impacts would be temporary and would move as construction progresses except at fixed installations. There would be a need to work at night in some locations to avoid excessive traffic congestion and for worker safety. The traffic management plan process and consultation with affected residents would take place to understand concerns, and all efforts would be made to complete the work as soon as practicable. Reasonable and feasible noise mitigation measures would also be applied.	C	Reduced level of impacts predicted as a result of the shorter route length resulting from the modification, therefore, reducing construction time and extent of potential of impacts.	C (Positive)

Aspect	Impact	Comment (from approved Project EA risk analysis)	Residual risk ranking (from approved EA)	Potential impacts of proposed modification	Revised risk ranking (proposed modification)
Noise from operation at the RWTP site	Loss of amenity for surrounding residents	Process equipment at the RWTP would be housed inside buildings. An earth embankment would be constructed at the northern boundary of the RWTP site if sufficient volumes of spoil are available, to further attenuate any plant noise.	C	Reduced level of impacts predicted as a result of the shorter route length resulting from the modification, therefore, reducing construction time and extent of potential of impacts.	C (Positive)
Vibration from construction	Potential structural damage, particularly heritage structures	No heritage structures identified in or adjacent to project areas. Structures typically set back from construction areas in road corridors and public reserves.	C	Reduced level of impacts predicted as a result of the shorter route length resulting from the modification, therefore, reducing construction time and extent of potential of impacts.	C (Positive)
Traffic and transport					
Works in road corridor	Traffic congestion due to changed conditions/detours.	Works in public roads would result in congestion. Relevant road authorities would be consulted as part of the Traffic Management Plan and where agreed, congestion would be avoided through rescheduling the works or altering closures.	B	The modification to the route alignment would result in less disturbance to the high traffic flow along Tangerine Street and Woodville Road by realigning the recycled water pipeline along Orchardleigh Street.	B (Positive)
	Loss of property access	Loss of property would be temporary during the construction stage, usually limited to one day at any one location and limited to construction hours only (not more than 11 hours at any one location). Access would be restored at the end of every working day. Access for emergency vehicles would be maintained at all times.	C	No change in the level of impacts predicted as a result of the modification.	C
	Loss of access to public transport facilities	Traffic management processes would be used and public transport providers would be consulted to minimise inconvenience.	C	No change in the level of impacts predicted as a result of the modification.	C
	Worker safety	Worker safety would be important in considering the timing of road works. Legislative requirements and Australian standard procedures would be followed.	C	No change in the level of impacts predicted as a result of the modification.	C

Aspect	Impact	Comment (from approved Project EA risk analysis)	Residual risk ranking (from approved EA)	Potential impacts of proposed modification	Revised risk ranking (proposed modification)
Additional traffic generation from spoil truck movements	Traffic congestion and loss of amenity	Excavation volumes would be relatively low and impacts would be worst in low traffic volume areas (e.g. RWTP site). Overall these impacts would be temporary during construction, limited in duration and only during daytime hours.	C	The modified pipeline would be approximately 940 m shorter than the approved pipeline. As such, a reduced level of impact is predicted as a result of the modification.	C (Positive)
Visual					
Construction of permanent structures	Loss of amenity	Generally visual impacts are considered to be low to moderate in the short term due to immature landscape plantings at Woodville reservoir and the RWTP.	C	No change in the level of impacts predicted as a result of the modification.	C
Construction work areas and sites	Loss of amenity	Any impacts during construction would be temporary.	C	No change in the level of impacts predicted as a result of the modification.	C
Social impact/benefit					
Construction activities	Loss of amenity	Amenity would be disturbed during construction, including interruption of access, construction noise, construction dust, visual, traffic congestion. These would be temporary during the construction period. Property owners would be consulted to understand specific concerns and keep them updated on the status of construction works.	C	The modification to the recycled route alignment would result in less disruption to the high traffic flow along Tangerine Street and Woodville Road.	C (Positive)
Impact on community facilities	Loss of community space and enjoyment	The RWTP would be positioned adjacent to the Fairfield SSTP in an open space owned by SWC. The RWTP would occupy approximately 17% of this open space. The Woodville reservoir would be located on private property (Woodville Golf Course), but would not affect community enjoyment of this facility.	C	No change in the level of impacts predicted as a result of the modification.	C
Unsocial behaviour around permanent facilities		Safety in design concepts would be adopted, including lighting to discourage undesirable behaviour. Regular security patrols would be initiated.	C	No change in the level of impacts predicted as a result of the modification.	C

Aspect	Impact	Comment (from approved Project EA risk analysis)	Residual risk ranking (from approved EA)	Potential impacts of proposed modification	Revised risk ranking (proposed modification)
Reduction in demand for potable water (positive)	Reduces reliance on existing potable water supplies Defers investment in new potable water and sewage treatment infrastructure Increases security of existing potable water supplies Enhances the benefit of the investment in the LAP Beneficial reuse of wastewater stream	Achieves a long-term and sustainable community benefit.	A (Positive)	No change in the level of impacts predicted as a result of the modification.	A (positive)
Geotechnical/subsidence					
Works in road corridor	Trench subsidence leads to unsatisfactory ride quality for motorists and early pavement deterioration	Adhere to road owners requirements for pavement rectification works.	C	No change in the level of impacts predicted as a result of the modification.	C
Cumulative impacts					
Concurrent work activities	Cumulative impacts on amenity (e.g. noise, dust, access disruption, night works)	Possible concurrent road resurfacing and maintenance activities and third party utility installations. These works are likely to be small scale and of limited duration.	C	No change in the level of impacts predicted as a result of the modification.	C
LAP as source of feed water (effluent) for recycling process	Enhances benefit of LAP investment	Benefits of LAP enhanced by proceeding with the project.	A (Positive)	No change in the level of impacts predicted as a result of the modification.	A (positive)

Aspect	Impact	Comment (from approved Project EA risk analysis)	Residual risk ranking (from approved EA)	Potential impacts of proposed modification	Revised risk ranking (proposed modification)
Hazards and risk					
Chemical storage and handling (RWTP) and spills (operation)	Contamination of soil and water, OHS issues (public and workforce)	Best practice handling and storage procedures would be adopted and minimum legislative requirements would be adhered to. Limited quantities of chemicals required.	C	No change in the level of impacts predicted as a result of the modification.	C
Works in road corridor	Public and workforce impacts	All best practice and legislative requirements would be adhered to to minimise the potential for safety incidents.	C	Reduced level of impacts predicted as a result of the shorter route length resulting from the modification, therefore, reducing construction time and extent of potential of impacts.	C (Positive)
Worker OHS	Accidental interaction with contaminated materials/ land	All best practice and legislative requirements would be adhered to to minimise potential safety incidents.	C	No change in the level of impacts predicted as a result of the modification	C
Energy/resource use/greenhouse gas					
Emissions during construction	Resource consumption and emissions during construction	The project would not result in any resources becoming scarce or in short supply. Construction would consume fossil fuels and use electricity, water and petrol/diesel. The energy use would be temporary and necessary to achieve the project benefits.	C	Reduced level of impacts predicted as a result of the shorter route length resulting from the modification, therefore, reducing construction time and extent of potential of impacts.	C (Positive)
Emissions during operation	Resource consumption and emissions during operation	Would require long-term use of electricity for pumps, metering, facility lighting. Where possible, energy-saving devices (e.g. lighting) would be used. This energy use is necessary to achieve the project benefits.	C	No change in the level of impacts predicted as a result of the modification.	C

Aspect	Impact	Comment (from approved Project EA risk analysis)	Residual risk ranking (from approved EA)	Potential impacts of proposed modification	Revised risk ranking (proposed modification)
Soils and erosion					
			Refer surface water quality	No change in the level of impacts predicted as a result of the modification.	Refer surface water quality
Lighting					
Night works	Light spill to properties	Necessary for safety reasons. Any impacts would be temporary. Lights would be directed away from properties where possible.	C	Reduced level of impacts predicted as a result of the shorter route length resulting from the modification, therefore, reducing construction time and extent of potential of impacts.	C (Positive)
Permanent lighting at RWTP Site	Light spill to properties	The minimum lighting required would be provided to ensure public safety and discourage unsocial behaviour.	C	No change in the level of impacts predicted as a result of the modification	C
Spoil and waste management					
Litter from worksites	Reduced visual amenity	Construction sites would be kept tidy. Bins would be provided and would be regularly emptied.	C	No change in the level of impacts predicted as a result of the modification.	C
Spoil management during construction	Appropriate disposal of waste	The project would generate excess spoil. If spoil could not be reused in the excavations, it would be removed and disposed of to an appropriate location.	C	No significant change in the level of impacts predicted as a result of the modification.	C
Disposal of waste during operation	Change in effluent quality/ quantity	The project would reduce the quantity of effluent treated at the Malabar STP; however, the load of pollutants would be the same.	C	No change in the level of impacts predicted as a result of the modification.	C
Soil contamination identified at RWTP and Rosehill sites	OHS issues for public and workforce	Contaminated land has been identified and contamination characterised. Appropriate management procedures would be adopted for handling and disposal.	C	No change in the level of impacts predicted as a result of the modification.	C

Aspect	Impact	Comment (from approved Project EA risk analysis)	Residual risk ranking (from approved EA)	Potential impacts of proposed modification	Revised risk ranking (proposed modification)
Utilities and services					
Works in proximity to existing utilities during construction	Impact on access and maintenance	Unlikely that access would be needed at the time of construction. Service providers would be consulted where interactions are expected. Any adjustments or required protection would be in accordance with the service provider requirements.	C	No change in the level of impacts predicted as a result of the modification.	C
	Interruption of supply	Service providers would be consulted to determine the locations of services. Standard precautions would also be taken (e.g. dial-before-you-dig) and a contingency management plan developed.	C	No change in the level of impacts predicted as a result of the modification.	C

5. Community and agency consultation

This chapter discusses the consultation activities carried out to date for the proposal as well as consultation activities undertaken as part of this supplementary environmental assessment for the modification.

5.1 Consultation during the approved Project EA phase

5.1.1 Consultation strategy

A comprehensive consultation strategy for the proposed works was developed at the project inception and revised during the scheme's development and approved Project EA phase.

The consultation strategy was implemented over the course of the proposal development and the approved Project EA phase. It was designed to ensure the philosophy and objectives of the proposal were clearly articulated, and the community was informed and included during the scheme's development and approved Project EA process.

The strategy delineated the process for the flow of information and feedback between the project team, agencies and the community by:

- outlining a schedule of community engagement activities, processes and procedures to be carried out
- outlining a process through which government agencies, utilities and community stakeholders could gain information about the project and provide comment to the members of the project team
- outlining roles and responsibilities of the project team
- developing clear and effective management protocols
- developing a framework for obtaining, considering, managing and documenting stakeholder and community feedback.

The key objectives for the consultation during the approved Project EA process aimed to:

- inform stakeholders and the community about the proposed works
- encourage stakeholders to provide input into the EA and provide two-way communication between the community, agencies and Jemena
- engage and involve the community to identify issues and opportunities and address key issues
- listen, understand and integrate feedback from the stakeholders to ensure relevant issues were considered during the design development and gauge the level of support or otherwise for the Project
- provide mechanisms for stakeholders to obtain information throughout the proposed works

- minimise the opportunity for speculation and misinformation about the planning process by ensuring there are no information gaps
- incorporate stakeholder feedback into the EA process in order to refine and improve the project.

5.1.2 Community involvement

A number of community involvement methods were applied during the preparation of the approved Project EA. These included the methods outlined in Table 5-1

Table 5-1 Summary of issues raised

Method	Description
Newsletters	Three community updates in the form of newsletters were prepared and distributed to properties comprising of private dwellings, industry and businesses. The newsletters were translated into six different languages to cater for the large number of NESB's (non English speaking background) in the area. The first newsletter, distributed to 24,500 properties, provided an overview of the Project and the approved Project EA process. It also advertised the date, time and location of three community information sessions and gave details of how to get in touch with the project team. A second newsletter, distributed to 16,559 properties, provided an introduction to the environmental assessment and informed stakeholders of the exhibition period and how to make a submission. The five exhibition locations were advertised in this update as well as the project team's contact details. The third newsletter was also distributed to 16,559 properties and provided an update on the works as well the approvals process and community consultation. Stakeholders were encouraged to contact the project team with enquiries or comments.
Community information sessions	Three community information sessions were held during the planning, design and assessment phase of the Project (Fairfield Community Centre, Granville Community Centre and Guilford Community Centre). These sessions were held as open house meetings and the community were encouraged to view the route maps and ask questions of the project team. The sessions presented information about the scheme and the outcomes of the approved Project EA. A reply paid feedback form was also distributed to provide an additional avenue for community feedback.
Resident letters	Individual letters were sent to North Street residents to provide an overview of the Project and invite residents to attend the community information sessions, as well as a one-on-one meeting with the project team.
Advertisements	A number of advertisements were placed in both local and ethnic press throughout the approved Project EA development. The advertisements notified the community about the Project and invited them to attend any of the three community information sessions.
Public exhibition	The EA was placed on public exhibition for a period of 30 business days at the following locations: • Nature Conservation Council • Bankstown City Council • Fairfield City Council • Holroyd City Council • Parramatta City Council.

Website	A project website was developed at the commencement of the project. Some sections of the website were translated into six different languages to cater for the large number of NESB's in the area. The website included information on the background to the proposal, route information, frequently asked questions, fact sheets and maps, as well as the project team's contact details.
1800 number and email address	A 24-hour / seven day a week community enquiry line was in operation during the approved Project EA assessment. The 1800 number was advertised widely to the community as a means of obtaining further information. An emergency service number was also advertised. An interpreter was also made available for NESB calls. A dedicated email address was also provided.
Project database	A contact and issues management database (Consultation Manager) was setup to manage stakeholder contact details, contact made and issues raised.

5.1.3 Agency and utility consultation

Planning focus meeting

This meeting was attended by representatives from DoP, Department of Environment and Climate Change (now DECCW), various councils (Bankstown, Fairfield, Holroyd and Parramatta), the Roads and Traffic Authority, Railcorp and SWC. Representatives from the Department of Water and Energy, the Department of Primary Industries and the Department of Health were also invited but unable to attend. The aim of the meeting was to provide an overview of the Project, identify the key environmental issues and provide an opportunity for key stakeholders to comment on the proposed works and approved Project EA process.

Letters to government and agencies

A letter including a copy of the Project newsletter was sent to three local members; the Honourable Joe Tripodi (Member of Fairfield); Tanya Gadiel (Member for Parramatta); and David Borger (Member for Granville) to advise them of the Project and invite them to a one-on-one meeting with the project team. Letters were also sent to the General Managers of the four council's that would be affected by the Project (Bankstown, Fairfield, Holroyd and Parramatta) and relevant government agencies including the Department of Environment and Conservation (now DECCW), Department of Health and the Department of Primary Industries.

Local government workshop

A council workshop was attended by representatives of Bankstown, Fairfield, Holroyd and Parramatta Councils. The aim of the workshop was to outline the Project and seek comment during the preparation of the approved Project EA, identify key issues and discuss the consultation process.

Ongoing general correspondence

A number of ongoing letters, telephone calls and emails were undertaken with the Department of Water and Energy, the Roads and Traffic Authority, RailCorp, DECCW, Department of Health and the Department of Primary Industries.

5.2 Consultation during the modification assessment

5.2.1 Community involvement

Resident/Business letters and feedback forms

On 25 February 2010, a letter was delivered to all residents and businesses along Orchardleigh Street to provide an overview of the approved Project, progress to date, the EA process and the proposed modification — in particular the change to the approved pipeline route. A map was included as well as a feedback form requesting any comments by 25 March 2010. This allowed a period of one month for feedback forms to be received before the information was collated. The project team's contact details were also provided for further information.

Door knocking

On 22 March 2010 approximately 120 properties, including residential and business premises, were door knocked in Orchardleigh Street over a period of six hours. Of the 120 properties door knocked, approximately 70 face-to-face briefings were held. At these briefings, attention was drawn to the letter sent out by Jemena the month prior and the feedback form attached. Residents were encouraged to fill in the feedback form and return it to Jemena by an extended date of 1 April 2010. Information was provided on the Project as a whole, as well as the potential construction works that would need to take place in the street. At these briefings all concerns stated by residents and businesses were noted and later placed in a database. It was noted that a number of residents were of non-English speaking background and plain English information as well as translator services contact details were given to these residents.

The remaining 50 residents that were not at home were left a copy of the original letter and feedback form (with extended return date), as well as a calling card that clearly stated Jemena's contact details for further information.

From the door knock discussions it was evident that the main issues of concern included: access during construction (15); design (2); timing (3); noise (3); business impacts (7); air quality (2); human health (4); parking (2); utility disruption (1); safety (1); and traffic (1). However, majority of the responses were of an indifferent or positive nature. A total of eight feedback forms were received from the above mail outs outlining issues similar to above; with access being the main issue.

Each of these issues are detailed and addressed in Table 5-2.

1800 number and email address

The 1800 number continued to be monitored around the clock to facilitate answering any questions that the community had regarding the modification or Project in general. The email address was also monitored daily for enquiries. A total of 10 calls were made to the 1800 throughout the life of the current modification Project.

Website

The project website continued to be updated throughout the preparation of the modification EA, providing clear information on the modification proposed.

Project database

Consultation Manager was continually populated following consultation activities undertaken and enquiries received throughout the modification EA process.

5.2.2 Government agency and utility consultation

Fairfield City Council

As part of the consultation process, a full copy of the draft modification EA report was provided to Fairfield City Council in April 2010.

The objective of this consultation was to ensure that Fairfield City Council, as the local government affected by the proposed development, was aware of the project and the potential impacts of the development. In addition, the draft modification EA report allowed Fairfield City Council to provide comments on the report and/or the project. Fairfield City Council responded to the draft modification EA 18 May 2010 and did not raise any significant issues.

The only issue of concern raised by Fairfield City Council was the potential impact of the proposed modification on recently upgraded roadwork. Fairfield Council requested that liaison between Jemena and Fairfield Council prior to construction works occurring in this area.

A copy of the correspondence received from Fairfield City Council is attached as Appendix D.

Letters to government

In addition to the consultation undertaken with Fairfield City Council, letters of notification were also sent to the following government agencies and stakeholders seeking comment on the proposed modifications and issues to be considered during the preparation of the supplementary EA:

- Bankstown City Council
- Parramatta City Council
- Holroyd City Council
- Department of Environment, Climate Change and Water
- Department of Health
- Member for Fairfield, Honourable Joe Tripodi
- Member for Granville, Honourable David Borger
- Member for Parramatta, Honourable Tanya Gadiel
- RailCorp
- Roads and Traffic Authority
- Sydney Water.

As at the time of lodgement, no responses from the above agencies had been received.

5.3 Summary of issues raised

The issues raised by government agencies, the community and other stakeholders both during the development of the EA as well as the development of the modification EA are detailed in Table 5-3.

Table 5-2 Summary of issues raised

Stakeholder	Consultation undertaken and issues raised regarding the proposed modifications	Relevance to proposed modification and mitigation measures
Community		
Noise and vibration	▪ Concern regarding the potential noise impacts during construction was raised by residents, as some are shift workers.	Potential noise impacts are considered in Section 4.3 of this modification EA.
Traffic, parking and access	▪ Concern was raised by businesses and some residents around the importance of 24 hour access to their properties. ▪ The schools also raised access as a point of concern and requested that works be undertaken in the school holidays. ▪ Concern was raised over the pressure on limited parking in the area.	Discussion was held with those businesses that had twin access points (in particular John Cootes and Caltex) regarding staging works so one access point is maintained at all times. Mitigation measures to include metal plates being placed over concerned residents' driveways. A traffic management strategy would be developed as part of the CEMP.
Air quality	▪ Concern was raised over increased dust in the street especially around asthmatic children.	Potential air quality impacts are considered in the Hazard Risk Analysis in Section 4.10.
Flora and Fauna	▪ No issues were raised by the community regarding flora or fauna impacts as a result of the notification letter sent 25 February 2010 regarding the proposed modifications (at time of writing).	Nil. No comments received from modification notification
Visual amenity	▪ No issues were raised by the community regarding visual amenity impacts as a result of the notification letter sent 25 February 2010 regarding the proposed modifications (at time of writing).	Nil. No comments received from modification notification
Odour impacts	▪ No issues were raised by the community regarding odour impacts as a result of the notification letter sent 25 February 2010 regarding the proposed modifications (at time of writing).	Nil. No comments received from modification notification
Water quality	▪ No issues were raised by the community regarding water quality impacts as a result of the notification letter sent 25 February 2010 regarding the proposed modifications (at time of writing).	Nil. No comments received from modification notification

Stakeholder	Consultation undertaken and issues raised regarding the proposed modifications	Relevance to proposed modification and mitigation measures
Health and safety	▪ Concern was raised by a resident regarding private access to driveway allowing for access to medical services. ▪ Questions were asked about whether the recycled water would be connected to the house mains. ▪ Concern was raised over possible utility disruption.	Mitigation measures to include metal plates being placed over those concerned residents driveways . Recycled water not for residential usage. No utility disruption likely to occur as a result of the construction works.
Business impacts	▪ Concern was raised by some businesses around the importance of access to their business for customers and deliveries. ▪ Preferred timings were given to Jemena by some businesses	Discussion was held with those businesses that had twin access points (in particular John Cootes and Caltex) regarding staging works so one access point is maintained at all times. Mitigation measures to include metal plates being placed over those concerned businesses driveways. Preferred timings as given by some businesses will try to be accommodated with regards to staging works.

6. Environmental management

6.1 Construction environment management plan

PB has prepared a CEMP (November 2009) for the overall Rosehill Recycled Water Scheme. It describes how Jemena and its contractors would coordinate, implement and manage construction and environmental issues during the construction of the distribution network for the approved project.

The CEMP deals with management measures that need to be implemented to ensure compliance with the Minister for Planning's Conditions of Approval, including the commitments made in the approved Project EA. The CEMP contains a number of sub-plans, which cover issues including:

- traffic and access impacts
- noise and vibration impacts
- biodiversity/flora and fauna impacts
- impacts of acid sulfate soils.

The CEMP consists of the following sections:

Section 1 Describes the CEMP's purpose and format. Also lists reference documents and the document control process for the CEMP.

Section 2 Provides a concise description of the project, including the main construction activities, staging, and scheduling for the Project.

Section 3 Establishes the environmental management framework for implementing the CEMP in relation to Jemena's Environmental Management System (EMS).

Section 4 Describes the environmental control(s) applicable to the project, including:

- a summary of statutory approval requirements
- an outline of the risk assessment undertaken
- an environment plan that addresses the project environmental aspects, impacts and objectives for the project.

Section 5 Contains the CEMP's implementation plan, which details the specific environmental management procedures and environmental performance monitoring required in the Conditions of Approval.

6.1.1 Impact of the proposed modification

Following approval of the proposed modification outlined in this EA, the approved CEMP would need to be amended to reflect the modification. Each of the sub-plans and the existing CEMP would be updated. Given the context and scope of the modification, it is considered these plans would not require substantial augmentation once approval has been granted by the Minister for Planning.

7. Draft statement of commitments

The approved Project EA identified a range of environmental outcomes and management measures with the aim of minimising and/or mitigating, as far as practicable, the identified impacts associated with the Project. These measures were developed as a Draft Statement of Commitments for the project to be undertaken throughout construction and operation of the project.

All of the commitments that were made as part of the approved Project are still considered to be relevant to the Project and the proposed modification. Table 7-1 provides a list of updated commitments that are relevant to the proposed modification.

Table 7-1 Draft statement of commitments

Objective	Reference	Commitment	Timing	Revised commitment
General				
Ensure compliance with environmental management measures	1	The activity would be carried out consistent with the procedures, safeguards and mitigation measures identified in this EA.	Pre-construction and construction	The activity would be carried out consistent with the procedures, safeguards and mitigation measures identified in approved Project EA and the proposed safeguards and mitigation measures identified in this modification EA.
	5	A CEMP will be prepared and will incorporate the mitigation measures contained in the EA, Statement of Commitments and any additional measures identified in the Submissions Report.	Pre-construction and construction	A CEMP will be prepared and will incorporate the mitigation measures contained in the EA, statement of commitments and any additional measures identified in the submissions report. The CEMP would be revised and updated following approval of the proposed modification to reflect any changes that may occur.
Traffic and transport and access				
Minimise disruptions to traffic during construction	15	Detour plans would be developed as part of traffic management plans (TMPs) that would re-direct traffic around the work zones by use of other parallel routes, where practicable.	Construction	Detour plans would be developed as part of TMPs that would redirect traffic around the work zones by use of other parallel routes, where practicable. The TMP would be revised and updated to reflect the proposed realignment of the recycled water pipeline along Orchardleigh Street and the resultant changes to the proposed detours required.
Noise and Vibration				
Minimise construction noise and vibration impacts throughout construction	18	Construction noise and vibration management will be implemented through a noise and vibration sub plan.	Construction	Construction noise and vibration management will be implemented through a noise and vibration sub-plan. The noise and vibration sub-plan would be revised and updated following approval of the proposed modification to reflect any changes which may occur.

Objective	Reference	Commitment	Timing	Revised commitment
Waste management (including contaminated land)				
Minimise the impacts of any contaminated soil on the surrounding environment during the construction of the works	31	A waste management sub plan will be prepared focussing on spoil management and contamination issues	Construction	A waste management sub-plan will be prepared that focuses on spoil management and contamination issues. The waste management sub-plan will be revised and updated following approval of the proposed modification to reflect any changes that may occur.
Water quality				
Manage the generation of dust during construction	42	Erosion and sediment control plans (ESCP) will be developed for each work area prior to the start of the construction and will be regularly updated as the works progress. These will be in the form of marked-up site drawings.	Construction	ESCP will be developed for each work area before construction starts and will be regularly updated as the works progress. These will be in the form of marked-up site drawings. The ESCP will be revised and updated following approval of the proposed modification to reflect any changes that may occur.

8. Ecological sustainable development

The Environmental Planning and Assessment Regulation 2000 requires justification for development that has regard to the biophysical environment and the principles of ecological sustainable development (ESD). The four principles of ESD are:

- *The precautionary principle* — if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.
- *Inter-generational equity* — the present generation should ensure that the health, diversity and productivity of the environment are maintained, or enhanced, for the benefit of future generations.
- *Conservation of biological diversity and ecological integrity* — maintain or enhance the range of native plants and animals and the health of natural areas.
- *Improved valuation, pricing and incentive mechanisms* — environmental factors should be included in the valuation of assets and services.

This section summarises how these principles have been taken into account with respect to the proposed Project modification.

Avoiding and reducing environmental impacts

The design of the original Project has further considered the potential environmental effects following approval. This has led to a preferred design that is sensitive to environmental, social and economic issues.

The realignment of the pipeline would continue to be constructed within the disturbed and modified urban environment of Orchardleigh Street. The modified pipeline route would result in limited impact on existing vegetation. Additionally, alternative construction methods, (including subsurface techniques), are available to the construction contractor, which will allow for appropriate management measures to be implemented as necessary, thereby reducing potential impacts.

The impacts of the modification mainly relate to the construction period and would, therefore, be short-term.

Environmental costs and benefits of Project alternatives

The benefits identified in the approved Project EA would continue to apply to if the proposed modification were to occur. These benefits include:

- reduced potable water demand from high volume industrial water users
- increased security and reliability of existing drinking water supplies
- enhanced benefits associated with the NSW Government's investment in the LAP
- deferred investment in additional water supply and sewerage infrastructure

- enabled future fulfilment of the NSW Government's target reductions in potable water use and target volumes of recycled water supply
- private sector leadership in the provision of recycled water in NSW.

Sustainability and other considerations

Section 5 of the EP&A Act outlines the objects of this Act, inclusive of the desire 'to encourage the proper management, development and conservation of natural and artificial resources including ….water… for the purpose of promoting the social and economic welfare of the community and a better environment' s5(a)(i) and 'ecologically sustainable development' s59(a)(vii). 'Ecologically sustainable development' has the meaning defined in the *Protection of the Environment Administration Act 1991*, including the principles of:

- precaution
- intergenerational equity
- conservation of biological diversity and ecological integrity
- improved valuation and pricing of environmental resources.

As outlined in the approved Project EA, the approved Project is part of the NSW Government's security and reliability approach to potable water supplies for the current and future population of Sydney. The modification has not identified any residual risks of serious or irreversible harm if the proposed mitigation measures are implemented. In particular, the Project would have minimal impact on biological resources.

9. Conclusion

This assessment has provided an investigation of the proposed modification to realign part of the approved Rosehill Water Recycling Project pipeline route. It is concluded that the long-term project benefits identified in the approved Project EA will continue to outweigh the generally short-term Project impacts.

The proposed modification to the approved pipeline route would also provide a number of benefits above and beyond the currently approved Project route. These have been discussed within the main body of this report and can be summaries as:

- providing a shorter route
- reducing the number of residents and businesses disturbed by the project
- undertaking the works in a shorter timeframe
- providing the opportunity for additional customers to access the recycled water.

The potential environmental impacts associated with the proposed modification, such as traffic, noise and flora and fauna in addition to the relative impacts on businesses and the community, are considered to be minor.

The proposed modification is, therefore, considered justified and adequate for approval by the Department of Planning.

10. References

Parsons Brinckerhoff Australia January 2009, *Camellia and Rosehill Recycled Water Project Environmental Assessment*.

Parsons Brinckerhoff Australia February 2010, *Environmental Assessment of the modification to the Camellia and Rosehill Recycled Water Project*.

Jemena Asset Management Pty Ltd 19 March 2009, *Camellia and Rosehill Recycled Water Scheme – Preferred Project Report.*

Appendix A

Project Approval 07_0121
(as modified)

Project Approval

Section 75J of the *Environmental Planning and Assessment Act 1979*

I, the Minister for Planning, approve the project referred to in Schedule 1, subject to the conditions in Schedule 2.

These conditions are required to:
- prevent, minimise, and/or offset adverse environmental impacts;
- set standards and performance measures for acceptable environmental performance;
- require regular monitoring and reporting; and
- provide for the ongoing environmental management of the project.

The Hon. Kristina Keneally MP
Minister for Planning

Sydney 1 June 2009 File No: 9043378

SCHEDULE 1

Application No:	07_0121
Proponent:	Aquanet Sydney Pty Ltd
Approval Authority:	Minister for Planning
Land:	Land required for the construction and operation of the proposal, including surface infrastructure and pipeline corridor generally within Fairfield, Parramatta, Bankstown and Holroyd Local Government Areas.
Project:	Construction and operation of the Camellia and Rosehill Recycled Water Scheme in Western Sydney which comprises: • recycled water treatment plant, pumping station, water storage tanks and other equipment at North Street, Fairfield; • a connection to the existing Liverpool to Ashfield pipeline; • one elevated surface water storage reservoir at Woodville Golf Course, Barbers Road, Guildford; • two surface reservoirs and one pumping station on Durham Street and Grand Ave, Rosehill; • approximately 20km of water distribution pipelines.
Major Project:	The project is a Major Project under *State Environmental Planning Policy (Major Projects) 2005* being development for the purpose of sewage and related wastewater treatment plants that has a capital investment value of more than $30 million (Schedule 1, Group 8, Clause 26).

KEY TO CONDITIONS

SCHEDULE 2

Act, the	*Environmental Planning and Assessment Act, 1979.*
Conditions of Approval	The Minister's conditions of approval for the project.
Councils	Fairfield City Council, Bankstown City Council, Parramatta City Council and Holroyd City Council.
DECC	Department of Environment and Climate Change.
Department, the	Department of Planning.
Director-General, the	Director-General of the Department of Planning (or delegate).
Director-General's Approval	A written approval from the Director-General (or delegate) where the Director-General's Approval is required under a condition. The Director-General may ask for additional information if the approval request is considered incomplete.
Director-General's Report	The report provided to the Minister by the Director-General of the Department under section 75I of the EP&A Act.
Dust	Any solid material that may become suspended in air or deposited
EA	*Rosehill Recycled Water Scheme, Environmental Assessment,* prepared by Parsons Brinckerhoff and dated January 2009.
EPL	Environment Protection Licence issued under the *Protection of the Environment Operations Act, 1997*
Pipelines	The drinking water, recycled water and wastewater pipelines detailed in the EA.
Minister, the	Minister for Planning
Proponent	Aquanet Sydney Pty Ltd (with Jemena Asset Management Pty Ltd acting on behalf of the Proponent)
Publicly Available	Available for inspection by a member of the general public (for example available on an internet site or at a display centre).
Site	Land to which Major Projects Application 07_0121 applies.
Preferred Project Report	*Camellia and Rosehill Recycled Water Scheme Preferred Project Report,* prepared by Jemena Asset Management and dated 19 March 2009.

1. ADMINISTRATIVE CONDITIONS

Terms of Approval

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.

1.2 In the event of an inconsistency between:
   a) the conditions of this approval and any document listed from condition 1.1a) to 1.1c) inclusive, the conditions of this approval shall prevail to the extent of the inconsistency; and
   b) any document listed from condition 1.1a) to 1.1c) inclusive, and any other document listed from condition 1.1a) to 1.1c) inclusive, the most recent document shall prevail to the extent of the inconsistency.

1.3 The Proponent shall comply with any reasonable requirement(s) of the Director-General arising from the Department's assessment of:
   a) any reports, plans or correspondence that are submitted in accordance with this approval; and
   b) the implementation of any actions or measures contained in these reports, plans or correspondence.

Limits of Approval

1.4 This project approval shall lapse five years after the date on which it is granted, unless the works the subject of this approval are physically commenced on or before that time.

1.5 The peak output operating capacity of the recycled water treatment plant is 25 megalitres per day.

Statutory Requirements

1.6 The Proponent shall ensure that all applicable licences, permits and approvals are obtained and maintained as required throughout the life of the project. No condition of this approval removes the obligation for the Proponent to obtain, renew or comply with such licences, permits or approvals. The Proponent shall ensure that a copy of this approval and all relevant environmental approvals are available on the site at all times during the project.

2. SPECIFIC ENVIRONMENTAL CONDITIONS

Noise Impacts

Vibration Impacts

2.1 The Proponent shall meet the requirements of *Assessing Vibration: A Technical Guideline* (DECC, February 2006) during the construction and operation of the project.

Construction Noise

2.2 The Proponent shall only undertake construction activities associated with the project that would generate an audible noise at the nearest sensitive receiver and at any residential premises during the following hours:
   a) 7:00 am to 6:00 pm, Mondays to Fridays, inclusive;
   b) 7:00 am to 1:00 pm on Saturdays; and
   c) at no time on Sundays or public holidays.

This condition does not apply in the event of a direction from police or other relevant authority for safety reasons, to prevent environmental harm or risk to life.

2.3 Notwithstanding condition 2.2 of this approval, the Proponent may undertake construction activities during the following additional periods, provided that those activities are detailed in an approved Construction Noise and Vibration Management Plan (refer to condition 6.3c)):
a) evening work: 6:00 pm to 10:00 pm, Mondays to Fridays; and
b) night-time work: 10:00 pm to 7:00 am, Mondays to Fridays

2.4 Notwithstanding conditions 2.2 and 2.3 of this approval, the construction hours specified under those conditions may be varied with the prior written approval of the Director-General. Any request to alter specified construction hours shall be:
a) considered on a case-by-case basis;
b) accompanied by details of the nature and need for activities to be conducted during the varied construction hours; and
c) accompanied by any information necessary for the Director-General to reasonably determine that activities undertaken during the varied construction hours will not adversely impact on the acoustic amenity of receivers in the vicinity of the relevant construction site.

Operational Noise

2.5 The Proponent shall design, construct, operate and maintain the project to ensure that the noise contributions from the project to the background acoustic environment do not exceed 40 dB(A) (measured as $L_{Aeq(15\text{-}minute)}$) at the most-affected residential receiver. This maximum allowable noise contribution applies under wind speeds up to 3 ms^{-1} (measured at 10 metres above ground level), and under temperature inversion conditions of up to 3 °C/ 100 metres.

Air Quality Impacts

Dust Generation

2.6 The Proponent shall construct and operate the project in a manner that minimises dust emissions from the site, including wind-blown and traffic-generated dust. All activities on the site shall be undertaken with the objective of preventing visible emissions of dust from the site, including the following:
a) staged construction work to expose only one area at a time, where practical;
b) stabilisation of exposed areas as soon as possible following completion of construction works; and
c) scheduling of work to avoid generation of dust during unfavourable meteorological conditions.

2.7 Should visible dust emissions occur at any time, the Proponent shall identify and implement all practicable dust mitigation measures, including cessation of relevant works, as appropriate, such that emissions of visible dust cease.

Odour

2.8 The Proponent shall not cause or permit the emission of offensive odours from the site in accordance with the provisions of Section 129 of the *Protection of the Environment Operations Act 1997*.

Traffic and Transport Impacts

2.9 Upon determining the haulage route(s) for the construction, the Proponent shall:
a) commission a qualified person to undertake a Road Dilapidation Report of all roads proposed to be used for construction activities in consultation with relevant road authorities. The Report shall assess the current condition of the relevant roads.
b) following completion of construction a subsequent Road Dilapidation Report shall be prepared to assess any damage that may have resulted due to traffic and transport related to the construction and ongoing operation of the project.

The Proponent shall commit to restore the relevant roads to a state described in the original Road Dilapidation report. The cost of any restorative work described in the subsequent Report

or recommended by the relevant road authorities after review of the subsequent Report, shall be funded by the Proponent. Such work shall be undertaken at a time as agreed upon between the Proponent and the relevant road authorities. In the event of a dispute between the parties with respect to the extent of restorative work that may be required under this condition, any party may refer the matter to the Director-General for resolution. The Director-General's determination of any such dispute shall be final and binding on the parties.

2.10 The Proponent shall undertake all works affecting a public road or road reserve in consultation with and to meet the requirements of the RTA and relevant Council.

2.11 The Proponent shall ensure that all pipeline crossings of roads are constructed using construction methods and depth covered determined in consultation with the relevant road authority.

2.12 All works associated with the project are to be at no cost to the RTA or relevant road authority. The Proponent shall, prior to construction, liaise with the RTA to determine whether a Works Authorisation Deed is required.

2.13 Where directional drilling/boring is proposed under roads or where trenching is proposed within road reserves, prior to the commencement of construction of pipelines, the Proponent shall consult with the relevant road authority and prepare a report to their reasonable satisfaction, the following matters:

a) detailed plans of the pipeline including vertical and horizontal alignment;
b) plant and equipment proposed to be used and construction compound locations;
c) construction schedule and hours of construction;
d) proposed lane closures of the road network prior to commencement of work;
e) specific plans required prior to submission of road occupancy licence applications;
f) mitigation measures proposed to reduce impacts to traffic and pedestrian safety; and
g) indicative maintenance arrangements during operation.

Contamination and Remediation

2.14 The Proponent shall ensure that contaminated areas of the recycled water treatment plant site and other work areas are appropriately remediated, if necessary, prior to the commencement of construction works associated with the project in those areas. All remediation work shall be conducted in accordance with the requirements of the *Contaminated Land Management Act 1997* and *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites (1997).*

2.15 Prior to any construction or excavation works adjacent to Norris Street, Loftus Road, Dursley Road, Fairfield Road and Pine Road, in the Holroyd City Council area, the Proponent shall conduct a preliminary contamination assessment to identify any areas affected by contamination.

2.16 Prior to the commencement of site preparation and construction works associated with the project that may directly disturb known contaminated areas of the site, the Proponent shall submit to the Director-General a Site Audit Statement(s) - Construction prepared by an accredited Site Auditor under the Contaminated Land Management Act 1997, verifying that the contaminated areas have been remediated to a standard consistent with the intended land use.

Hazards, Risk and Land Use Safety

2.17 All demolition work shall be carried out in accordance with *AS 2601-2001 The Demolition of Structures.*

2.18 The Proponent shall store and handle all Dangerous Goods, as defined by the Australian Dangerous Goods Code, strictly in accordance with:

a) all relevant Australian Standards;

b) a minimum bund volume requirement of 110% of the volume of the largest single stored volume within the bund: and
c) DECC guidelines entitled: *Storing and Handling Liquids: Environmental Protection Participants Manual* and *Environmental Compliance Report: Liquid Chemical Storage Handling & Spill Management.*

In the event of an inconsistency between the requirements listed from a) to c) above, the most stringent requirement shall prevail to the extent of the inconsistency.

2.19 The Proponent shall implement all the mitigation and control measures listed in section 3.5 of the Preliminary Hazard Assessment (PHA) of the EA. The Proponent shall submit an update on the implementation status of these measures to the Director-General prior to the commencement of construction, and again prior to the commencement of commissioning of the project.

Pre-Commissioning Hazards Studies

2.20 Prior to the commencement of commissioning of the project the Proponent shall prepare and submit for the approval of the Director-General the following studies:
a) an **Emergency Plan** for the project. The Plan shall be prepared in accordance with the Department's publication *Hazardous Industry Planning Advisory Paper No. 1 - Industry Emergency Planning Guidelines.* The plan shall include detailed procedures for the safety of all people outside of the development who may be at risk from the project; and
b) a **Safety Management System**, covering all operations at the project and any associated transport activities involving hazardous materials. The System shall clearly specify all safety-related procedures, responsibilities and policies, along with details of mechanisms for ensuring adherence to safety procedures. The System shall be developed in accordance with the Department's publication *Hazardous Industry Planning Advisory Paper No. 9 - Safety Management.*

Flooding Impacts

2.21 Prior to the commencement of construction, the Proponent shall prepare engineering drawings in consultation with Fairfield Council for relocation of St Elmo's Drain to account for potential flooding impacts at the site of the recycled water treatment plant. The engineering drawings shall be submitted for the approval of the Director-General prior to the commencement of construction.

2.22 The Proponent shall include specific design features for bulk chemicals tanks and chemical container storage areas at the recycled water treatment plant to prevent impacts beyond the boundary of the site in the case of a flood event. The chemical storage and handling area shall be designed to meet the requirements of AS 3780-1994.

2.23 Prior to finalising the design of the recycled water treatment plant and the commencement of construction works, an overland flood risk analysis for the site, including modelling of overland flows during the 100 year ARI overland flow design flood, shall be undertaken. A copy of the overland flow modelling results shall be provided to Fairfield City Council and to the Department upon completion.

Ecological Impacts

2.24 The Proponent shall define predicted minor impact by the project on River-flat Eucalypt Forest, Cumberland Plain Woodland, Shale Gravel Transition Forest and Castlereagh Swamp Woodland in accordance with the documents referred to in condition 1.1 and prepare a strategy to offset such vegetation losses or impact, to the satisfaction of the Director-General. Details of the offset strategy shall be submitted for the approval of the Director-General prior to the commencement of construction.

2.25 The Proponent shall ensure prompt restoration of drainage channels, which may provide Green and Golden Bell Frog habitat and movement corridors along creek lines, during construction works to minimise potential ecological impacts.

2.26 All work, including waterway crossings, undertaken within 40 metres of waterways shall be conducted in accordance with the Department of Water and Energy *Guidelines for Controlled Activities.*

Heritage Impacts

2.27 Prior to the commencement of construction, all project personnel shall undergo project induction, covering education in protocols and offences relating to knowingly disturbing or destroying non-Aboriginal heritage items or Aboriginal relics, and including the potential for uncovering non-Aboriginal and/or Aboriginal relics in the project work areas.

2.28 In the event of uncovering any previously unidentified Aboriginal objects or relics, work shall cease immediately in the vicinity of the site and the event shall be reported immediately to the DECC. This requirement shall be included in the project induction and the Construction Environmental Management Plan.

Soil and Water Quality Impacts

2.29 The Proponent shall comply with section 120 of the *Protection of the Environment Operations Act 1997* which prohibits the pollution of waters.

2.30 The Proponent shall install and maintain for the duration of construction works associated with the project, erosion and sedimentation control measures consistent with *Managing Urban Stormwater: Soils and Construction* (Landcom, 2004).

2.31 The Proponent shall investigate options for the collection, storage and reuse of stormwater which may include the installation of rainwater tanks to capture stormwater from the roof of station buildings or the construction site buildings and use of this water for preparing concrete, dust suppression and establishing and maintaining revegetated areas and landscaping. Such options shall be incorporated into the Construction Environmental Management Plan required under condition 6.2 of this approval.

Waste Generation and Management

2.32 All waste materials removed from the site shall only be directed to a waste management facility lawfully permitted to accept the materials.

2.33 The Proponent shall maximise the treatment, reuse and/or recycling on the site of any excavated soils, slurries, dusts and sludges associated with the project, to minimise the need for treatment or disposal of those materials outside the site.

2.34 The Proponent shall not cause, permit or allow any waste generated outside the site to be received at the site for storage, treatment, processing, reprocessing, or disposal on the site, except as expressly permitted by a licence under the *Protection of the Environment Operations Act 1997*, if such a licence is required in relation to that waste.

2.35 The Proponent shall ensure that all liquid and/or non-liquid waste generated and/or stored on the site is assessed and classified in accordance with *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes* (DEC, 2004), or any future guideline that may supersede that document.

2.36 The Proponent shall manage any asbestos or asbestos-contaminated materials that may be uncovered during remediation or construction works strictly in accordance with the requirements of *Protection of the Environment Operations (Waste) Regulation 2005* and any guidelines or requirements issued by DECC in relation to these materials.

Visual Amenity and Urban Design

2.37 The Proponent is permitted to construct surface facilities and associated infrastructure at the recycled water treatment plant generally located and configured consistent with the preliminary designs presented in the documents referred to in condition 1.1 of this approval and in particular, Figure 2.1 of the document referred to under condition 1.1c). Heights of surface facilities will be limited as specified in Table 1.

Table 1 – Maximum Height of Surface Facilities

Item	Height Limit (m AHD)	Height Limit with access ladders & 1.2m high safety rails (m AHD)
Recycled Water Storage Tank	15.1	16.3
Feed Balance Tank	14.7	16.0
Detention Tank	14.9	16.2
Filtration (Reverse Osmosis) Building	17.1	18.4
Degasser	15.9	17.2
Flocculation Tank	13.5	14.7
Reverse Osmosis Tank	13.6	14.9
Reverse Osmosis Permeate Collection Tank	12.0	13.2

2.38 Prior to the construction of surface facilities at the recycled water treatment plant, the Proponent shall submit final designs to the Director-General, demonstrating consistency with the requirements of condition 2.37.

3. ENVIRONMENTAL MONITORING AND AUDITING

Noise Monitoring

3.1 Within 90 days of the commencement of operation of the pumping station at the recycled water treatment plant and the Rosehill pumping station, or as may be otherwise agreed by the Director-General, and during a period in which the pumping station and the recycled water treatment plant are operating under design loads and normal operating conditions, the Proponent shall review the noise emission performance of the pumping station and the recycled water treatment plant site. The review shall include, but not necessarily be limited to:

a) methodologies for noise monitoring;
b) location of noise monitoring;
c) frequency of noise monitoring;
d) identification of monitoring sites at which pre-operational and operational noise levels can be ascertained; and
e) details of any entries in the Complaints Register (condition 5.3 of this approval) relating to noise impacts.

A report providing the results of the program shall be submitted to the Director-General within 28 days of completion of the testing required under this condition.

3.2 In the event that the program undertaken to satisfy condition 3.1 of the approval indicates that the operation of the pumping stations and the recycled water treatment plant site, under design loads and normal operating conditions, will lead to greater noise impacts than permitted under condition 2.5 of this approval, then the Proponent shall provide details of remedial measures to be implemented to reduce noise impacts to levels required by that condition. Details of the remedial measures and a timetable for implementation shall be submitted to the Director-General for approval within such period as the Director-General may require.

4. COMPLIANCE TRACKING

4.1 Prior to each of the events listed below, the Proponent shall certify in writing to the satisfaction of the Director-General that it has complied with all conditions of this approval applicable prior to that event:

a. commencement of any construction works on the land subject of this approval; and
b. commencement of operation of the project.

4.2 The Proponent shall develop and implement a **Compliance Tracking Program** for the project, prior to commencing operations, to track compliance with the requirements of this approval and shall include, but not necessarily limited to:

a) provisions for periodic review of the compliance status of the project against the requirements of this approval and the Statement of Commitments detailed in the document referred to in condition 1.1 of this approval;
b) provisions for periodic reporting of the compliance status to the Director-General;
c) a program for independent environmental auditing in accordance with *AS/NZ ISO 19011:2003 - Guidelines for Quality and/or Environmental Management Systems Auditing*;
d) procedures for rectifying any non-compliance identified during environmental auditing or review of compliance;
e) mechanisms for recording environmental incidents and actions taken in response to those incidents;
f) provisions for reporting environmental incidents to the Director-General during construction and operation; and
g) provisions for ensuring all employees, contractors and sub-contractors are aware of, and comply with, the conditions of this approval relevant to their respective activities.

The Compliance Tracking Program shall be implemented prior to operation of the project with a copy submitted to the Director-General for approval within four weeks of commencement of the project, unless otherwise agreed by the Director-General.

4.3 Nothing in this approval restricts the Proponent from utilising any existing compliance tracking programs administrated by the Proponent to satisfy the requirements of condition 4.2. In doing so, the Proponent must demonstrate to the Director-General how these systems address the requirements and/or have been amended to comply with the requirements of the condition.

4.4 The Proponent shall meet the requirements of the Director-General in respect of the implementation of any measure necessary to ensure compliance with the conditions of this approval, and general consistency with the documents listed under condition 1.1 of this approval.

5. COMMUNITY CONSULTATION

5.1 Subject to confidentiality, the Proponent shall make all documents required under this approval available for public inspection on request.

Complaints Procedure

5.2 Prior to the commencement of construction of the project, the Proponent shall ensure that the following are available for community complaints for the life of the project (including construction and operation):

a) a telephone number on which complaints about construction and operational activities at the site may be registered;
b) a postal address to which written complaints may be sent; and
c) an email address to which electronic complaints may be transmitted.

The telephone number, the postal address and the email address shall be published in a local newspaper circulating in the local areas prior to the commencement of construction and prior to the commencement of operation. This information shall also be provided on the Proponent's website.

5.3 The Proponent shall record details of all complaints received through the means listed under condition 5.2 of this approval in an up-to-date Complaints Register. The Register shall record, but not necessarily be limited to:

a) the date and time, where relevant, of the complaint;
b) the means by which the complaint was made (telephone, mail or email);
c) any personal details of the complainant that were provided, or if no details were provided, a note to that effect;
d) the nature of the complaint;
e) any action(s) taken by the Proponent in relation to the complaint, including any follow-up contact with the complainant; and
f) if no action was taken by the Proponent in relation to the complaint, the reason(s) why no action was taken.

The Complaints Register shall be made available for inspection by the Director-General upon request.

6. ENVIRONMENTAL MANAGEMENT

Environmental Representative

6.1 Prior to the commencement of any construction or operational activities, or as otherwise agreed by the Director-General, the Proponent shall nominate for the approval of the Director-General a suitably qualified and experienced Environmental Representative(s) independent of the design, construction and operation personnel. The Proponent shall engage the Environmental Representative(s) during any construction activities, and throughout the life of the project, or as otherwise agreed by the Director-General. The Environmental Representative(s) shall:

a) oversee the implementation of all environmental management plans and monitoring programs required under this approval, and advise the Proponent upon the achievement of these plans/programs;
b) have responsibility for considering and advising the Proponent on matters specified in the conditions of this approval and the Statement of Commitments as referred to under condition 1.1c) of this approval;
c) oversee the implementation of the environmental auditing of the project in accordance with the requirements of condition 4.2 of this approval and all relevant project Environmental Management System(s); and
d) be given the authority and independence to recommend to the Proponent reasonable steps to be taken to avoid or minimise unintended or adverse environmental impacts, and, failing the effectiveness of such steps, to recommend to the Proponent that relevant activities are to be ceased as soon as reasonably practicable if there is a significant risk that an adverse impact on the environment will be likely to occur.

Construction Environmental Management Plan

6.2 The Proponent shall prepare and implement a **Construction Environmental Management Plan** (CEMP) to outline environmental management practices and procedures to be followed during construction of the project. The CEMP shall be consistent with *Guideline for the Preparation of Environmental Management Plans* (DIPNR, 2004) and shall include, but not necessarily be limited to:

a) a description of all relevant activities to be undertaken on the site during construction;
b) statutory and other obligations that the Proponent is required to fulfil during construction including all relevant approvals, consultations and agreements required from authorities and other stakeholders, and key legislation and policies;
c) details of how the environmental performance of the construction works will be monitored, and what actions will be taken to address identified potential adverse environmental impacts. In particular, the following environmental performance issues shall be addressed in the Plan:
    i) measures to manage dust emissions;
    ii) measures to monitor and minimise soil erosion and the discharge of sediment and other pollutants to lands and/ or waters during construction activities;

iii) measures to monitor and control noise emissions during construction works;
iv) measures to minimise the impact of construction on local flora and fauna and threatened species;
v) measures to implement in the case of uncovering previously unidentified soil and groundwater contamination during project excavations, including management of uncovered asbestos-contaminated sheeting and/or Acid Sulphate Soils.

d) a description of the roles and responsibilities for all relevant employees involved in the construction of the project;
e) the additional studies listed under condition 6.3 of this approval; and
f) complaints handling procedures during construction.

A separate CEMP may be prepared for each stage of the project. The relevant CEMP shall be submitted for the approval of the Director-General no later than one month prior to the commencement of any relevant construction works associated with the project, or within such period otherwise agreed by the Director-General. Construction works shall not commence until written approval has been received from the Director-General.

6.3 As part of the Construction Environmental Management Plan required under condition 6.2 of this approval, the Proponent shall prepare and implement the following in consultation with the relevant Councils and for approval by the Director-General:

a) an **Acid Sulphate Soil Management Plan**, if the mottled-clay soils at a depth of 1.0 m – 2.5 m below ground level along Berry Street (Granville) to Thackeray Street (Camellia) are to be disturbed during pipeline construction activities. The Plan shall be prepared in accordance with *Acid Sulfate Soil Manual* (Acid Sulfate Soil Management Advisory Committee, 1998);
b) a **Flora and Fauna Management Plan** to manage flora and fauna impacts during construction and include appropriate revegetation of impacted area. The Plan shall be prepared in consultation with DECC and the Councils and shall include, but not necessarily be limited to:
   i) details of all potentially affected threatened flora and fauna species and specific management procedures for the Green and Golden Bell Frog habitat;
   ii) weed control mechanisms and controls for the spread of disease and animal injury;
   iii) general management procedures for the construction of pipelines within vegetated corridors, and the rehabilitation of any disturbed vegetation.
c) a **Construction Noise and Vibration Management Plan** to manage noise and vibration impacts during construction of the pipeline, recycled water treatment plant, Woodville reservoir and Rosehill pumping station and to identify all feasible and reasonable noise and vibration mitigation measures. The Plan shall include, but not necessarily be limited to:
   i) details of all potentially affected sensitive receivers;
   ii) the construction noise and vibration goals identified in the EA for construction periods greater than 26 weeks;
   iii) specific activities to be conducted during the first hour of construction on Saturdays (7am to 8am) and measures to be incorporated to reduce noisey work during this specific time;
   iv) where the objectives are predicted to be exceeded, an analysis of feasible and reasonable noise and vibration mitigation measures that will be implemented to reduce construction noise and vibration impacts; and
   v) procedures for notifying residents of construction activities that are likely to affect their noise and vibration amenity.

   The Construction Noise and Vibration Management Plan shall be referred to the Department of Environment and Climate Change for comment prior to Director-General approval to ensure mitigation of impacts, particularly during evening and night-time works.
d) a **Traffic Management Plan** for all works to be carried out within public areas, or where construction activity impacts on traffic flow and bicycles or pedestrian access, in compliance with the requirements of *AS 1742.3 Traffic Control Devices for Works on Roads*. The Plan shall be prepared in consultation with the Councils, the relevant road

authority, bus companies and private property owners to address potential impacts which shall include, but not necessarily be limited to:

i) details of how construction of the project will be managed in proximity to local and regional roads;
ii) details of traffic routes for heavy vehicles, including any necessary route or timing restriction for oversized loads;
iii) provision for pedestrian access in the vicinity of construction areas, including disabled and pram access, cyclists, and provision for access to private properties;
iv) provision of vehicle parking in areas where existing parking spaces will be lost;
v) provisions to minimise impact on school traffic zones, including limited hours of work during school hours, compliance with speed limits by construction vehicles in school zones and where possible scheduling of construction work during school holiday periods;
vi) details of bus routes in the vicinity of construction areas, including proposed changes to existing routes; and
vii) demonstration that all statutory responsibilities with regard to road traffic impacts have been complied with.

Operation Environmental Management Plan

6.4 The Proponent shall prepare and implement an **Operation Environmental Management Plan** to detail an environmental management framework, practices and procedures to be followed during operation of the project. The OEMP shall be consistent with *Guideline for the Preparation of Environmental Management Plans* (DIPNR 2004) and shall include, but not necessarily be limited to:

a) identification of all relevant statutory and other obligations that the Proponent is required to fulfil in relation to operation of the project, including all relevant approvals, licences, approvals and consultations;
b) a description of the roles and responsibilities for all relevant employees involved in the operation of the project;
c) overall environmental policies and principles to be applied to the operation of the project;
d) relevant standards and performance measures to be applied to the project, and a means by which environmental performance can be periodically reviewed and improved, where appropriate;
e) management policies to ensure that environmental performance goals are met and to comply with the conditions of this approval; and
f) the additional plans listed under condition 6.5 of this approval.

A separate Operation Environmental Management Plan (OEMP) may be prepared for each stage of the project. The relevant OEMP shall be submitted for the approval of the Director-General no later than one month prior to the commencement of operation of the project, or within such period otherwise agreed by the Director-General. Operation shall not commence until written approval has been received from the Director-General.

6.5 As part of the Operation Environmental Management Plan required under condition 6.4 of this approval, the Proponent shall prepare and implement the following:

a) a **Landscape Management Plan** including but not limited to:
   i) measures to minimise and manage the use of herbicides for weed control;
   ii) a plan for the replacement of plants in accordance with Fairfield Council's Urban Creeks Master Plan in riparian areas affected by the project. This may include any need for establishment of access paths within the creek corridor area for maintenance or other works;
   iii) procedures for the removal of trees from Woodville Golf Course and rehabilitation plans for the visual impact of Woodville Reservoir;
   iv) planting of additional screening plants in the area of North Street to provide visual screening for local residents, using native shrubs.

b) an **Air Quality and Odour Management Plan** to outline measures to minimise impacts from the project on local and regional air quality. The Plan shall include, but not necessarily be limited to:
   i) identification of all major sources of odour that may be emitted from the project;
   ii) pro-active management and response mechanisms for odour emissions, with specific reference to measures to be implemented and actions to be taken to minimise and (where practicable) prevent potential odour impacts on surrounding land uses as a consequence of meteorological conditions, upsets within the project, or the mode of operation of the project;
   iii) provision for review of air quality monitoring data, with comparison of monitoring data with that assumed and predicted in the documents listed under condition 1.1 of this approval, including verification of air quality modelling and predictions, as may be relevant;
   iv) plans for regular maintenance of process equipment to minimise the potential for odour emissions; and
   v) a contingency plan should an incident, process upset or other initiating factor lead to elevated odour impacts, whether above normal operating conditions or environmental performance goals/ limits.

c) a **Noise Management Plan** to detail measures to mitigate and manage noise during operation of the recycled water treatment plant site, and Rosehill pumping station. The Plan shall include, but not necessarily be limited to:
   i) identification of noise-generating activities and/or sources in relation to the Rosehill pumping station and the recycled water treatment plant site;
   ii) identification of all relevant receivers and the applicable criteria at those receivers commensurate with the noise limits referred to in condition 2.4 of this approval;
   iii) procedures to ensure that all reasonable and feasible noise mitigation measures are applied during operation of the Rosehill pumping station and the recycled water treatment plant site; and
   iv) procedures to generate suitable documentation for environmental auditing, that demonstrates that best practice noise control operations are being implemented.

7. ENVIRONMENTAL REPORTING

Environmental Incident Reporting

7.1 The Proponent shall notify the Director-General of any environmental incident within 12 hours of becoming aware of the incident. The Proponent shall provide full written details of the incident to the Director-General within seven days of the date on which the incident occurred.

7.2 The Proponent shall meet the requirements of the Director-General to address the cause or impact of any environmental incident, as it relates to this approval, reported in accordance with condition 7.1 of this approval, within such period as the Director-General may require.

Annual Performance Reporting

7.3 The Proponent shall, throughout the life of the project, prepare and submit for the approval of the Director-General, an **Annual Environmental Management Report** (AEMR). The AEMR shall review the performance of the project against the Operation Environmental Management Plan (refer to condition 6.6 of this approval) and the conditions of this approval. The AEMR shall include, but not necessarily be limited to:
   a) details of compliance with the conditions of this approval;
   b) a copy of the Complaints Register (refer to condition 5.3 of this approval) for the preceding twelve-month period (exclusive of personal details), and details of how these complaints were addressed and resolved;
   c) identification of any circumstances in which the environmental impacts and performance of the project during the year have not been generally consistent with the environmental impacts and performance predicted in the documents listed under condition 1.1 of this approval, with details of additional mitigation measures applied to the project to address recurrence of these circumstances;

d) results of all environmental monitoring required under conditions 3.1 to 3.2 of this approval, including interpretations and discussion by a suitably qualified person; and
e) a list of all occasions in the preceding twelve-month period when environmental goals/objectives/impact assessment criteria for the project have not been achieved, indicating the reason for failure to meet the crtieria and the action taken to prevent recurrence of that type of failure.

The Proponent shall submit a copy of the AEMR to the Director-General every year, with the first AEMR to be submitted no later than twelve months after the commencement of operation of the project. The Director-General may require the Proponent to address certain matters in relation to the environmental performance of the project in response to review of the Annual Environmental Report. Any action required to be undertaken shall be completed within such period as the Director-General may require. The Proponent shall make copies of each AEMR available for public inspection on request.

Modification of Approval

Section 75W of the *Environmental Planning and Assessment Act 1979*

I, the Director Infrastructure Projects, in accordance with the Instrument of Delegation issued by the Minister for Planning, on 25 January 2010, pursuant to section 75W of the *Environmental Planning and Assessment Act 1979* determine the modification to the approval referred to in Schedule 1 in the manner set out in Schedule 2.

Scott Jeffries
Director Infrastructure Projects
as delegate for the Minister for Planning

Sydney, 1 April 2010

MP 07_0121 MOD 1

SCHEDULE 1

Project Approval:	granted by the Minister for Planning on 1 June 2009 (MP 07_021).
For the following:	Construction and operation of the Camellia and Rosehill Recycled Water Scheme (also known as the Rosehill Recycled Water Scheme). The project involves the construction and operation of the following key components: 1. construction and operation of a recycled water treatment plant (RWTP), pumping station, water storage tanks and other equipment at North Street, Fairfield; 2. a connection to the existing Liverpool to Ashfield pipeline (the source of feed effluent for the recycled water treatment process); 3. a distribution system, including: • an elevated storage reservoir at Woodville Golf Course, Barbers Road, Guildford; • two surface reservoirs and one pumping station on the south-east corner of Durham Street and Grand Avenue, Rosehill; and • a distribution pipeline approximately 20 kilometres long.
Modification:	Amendment to condition 1.1 to reflect a six part modification involving: a route realignment of the recycled water pipeline, an increase in transformer size at the Fairfield RWTP, a minor modification to the

wording of condition 2.37 regarding surface height limits at the RWTP, details of the alignment of a sewer connection pipeline between the RWTP and the sewer main, an increase in the height of the Woodville reservoir storage tank, and changes to the tank configuration at the Rosehill Reservoir. As a consequence, amendments have also been made to condition 1.2.

SCHEDULE 2

The approval is modified as follows:

1. Replacing existing condition 1.1 with new condition 1.1 as follows:

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 Jemena Asset Management and dated 19 March 2009 and supplementary letter to the Department of Planning from Parsons Brinckerhoff Australia Pty Ltd regarding commitments at Woodville reservoir dated 30 March 2010; and

e) the conditions of this approval.

2. Replacing existing condition 1.2 with new condition 1.2 as follows:

1.2 In the event of an inconsistency between:

a) the conditions of this approval and any document listed from condition 1.1a) to 1.d) inclusive, the conditions of this approval shall prevail to the extent of the inconsistency; and

b) any document listed from condition 1.1a) to 1.1d) inclusive, and any other document listed from 1.1a) to 1.1d) inclusive, the most recent document shall prevail to the extent of the inconsistency.

3. Replacing existing condition 2.37 with new condition 2.37 as follows:

2.37 The Proponent is permitted to construct surface facilities and associated infrastructure at the recycled water treatment plant generally located and configured consistent with the preliminary designs presented in the documents referred to in condition 1.1 of this approval and in particular, Figure 2.1 of the document referred to under condition 1.1c). Heights of surface facilities will be limited as specified in Table 1.

Table 1 – Maximum Height of Surface Facilities

Item	Height Limit (m AHD)	Height Limit (including any access ladders, safety rails, roof ventilation apparatus)
Recycled Water Storage Tank	15.1	16.3
Feed Balance Tank	14.7	16.0
Detention Tank	14.9	16.2
Filtration (Reverse Osmosis) Building	17.1	18.4
Degasser	15.9	17.2
Flocculation Tank	13.5	14.7
Reverse Osmosis Tank	13.6	14.9
Reverse Osmosis Permeate Collection Tank	12.0	13.2

Appendix B

Revised traffic and transport impact assessment

Our reference: 2117094B/LT_1920/SW/mm

23 April 2010

Adam Littman
Senior Environmental Planner
Parsons Brinckerhoff
Level 27, Ernst & Young Centre
680 George Street
Sydney
NSW 2000

Dear Adam

Proposed modifications to Rosehill Recycled Water Scheme – revised noise and vibration impact assessment

Parsons Brinckerhoff (PB) has been commissioned by Jemena Asset Management (Jemena) to provide assessment of potential noise impacts associated with the proposed modifications to the Rosehill Recycled Water Scheme.

This noise impact assessment has been prepared supplementary to the *Rosehill Recycled Water Scheme Environmental Assessment* (PB, January 2009).

1. Background

An assessment of potential construction noise and vibration impacts for the proposed scheme was undertaken as part of the project EA (*Rosehill Recycled Water Scheme – Noise and Vibration Impact Assessment*, NVIA, PB September 2008).

Project approval for the proposed recycled water scheme was granted in June 2009 (Application 07_0121) with relevant conditions:

- Condition 2.1 *Vibration Impacts* requires the project to meet requirements of *Department of Environment and Climate Change Assessing Vibration: A Technical Guideline* (DECC, February 2006) during the construction phase.
- Condition 2.2 *Construction Noise* of the Project Approval requires construction works that would generate noise audible at nearest sensitive receivers and at any residential receiver to be undertaken during core construction hours of 7 am-6 pm Monday to Friday, 7 am-1 pm Saturdays and at no time on Sundays or Public Holidays.
- Construction works may be undertaken outside of the day time core hours between 6 pm-10 pm (evening) and 10 pm-7 am (night time) Monday to Friday where the required construction activities are detailed in an approved Construction Noise and Vibration Management Plan (CNVMP).

Maximum allowable noise and vibration contributions from construction works at nearest receiver locations have not been specified in the Project Approval, it is expected the management of construction noise will be required to meet the requirements of *Department of Environment, Climate Change and Water* (former DECC) *Interim Construction Noise Guidelines* (DECCW, ICNG 2009).

2. Proposed project modifications

Detailed in Figure 1, the proposed route modification includes approximately 1.58 kilometres of pipeline between Railway Parade and Woodville Road along Orchardleigh Street. The modification would remove requirement for approximately 2.5 kilometres of pipeline sections on Normanby Street, Tangerine Street and Woodville Road.

The proposed pipeline would be installed using open trenching techniques. Works are to commence at the intersection of Orchardleigh Street and Railway Street and terminate at the approved pipeline at the intersection of Orchardleigh Street and Woodville Road.

3. Scope

The scope of work for this study was to prepare an assessment of potential construction noise and vibration impacts associated with the proposed project modifications. Where feasible, reference has been made to the predicted construction and operational noise impacts determined for the project NVIA and the modification report submitted to Department of Planning in February 2010 for 'Proposed Modification 1'.

Limitations to the scope of works and this assessment are as per the noise and vibration impact assessment undertaken for the project EA.

4. Construction noise and vibration impact assessment

4.1 Nearest potential noise affected receivers

Informed by initial site surveys the following receivers, detailed in Table 1 and presented in Figure 2, have been identified on Orchardleigh Street. Estimated separation distances from the pipeline alignment to nearest receiver building facades have been adopted in the assessment of potential construction noise and vibration impacts.

Table 1 Nearest receivers and land use to the pipeline alignment

Receiver	Distance to pipeline alignment, m
Residential dwellings (single storey)	12 - 20
Commercial premises and land use	20 - 30
Yennora Public School (classrooms)	50
Old Guildford Public School (classrooms)	50
'Alaadin' childcare centre	20
Guildford Arabic Baptist Church	50
Knight Park (recreational land use)	30

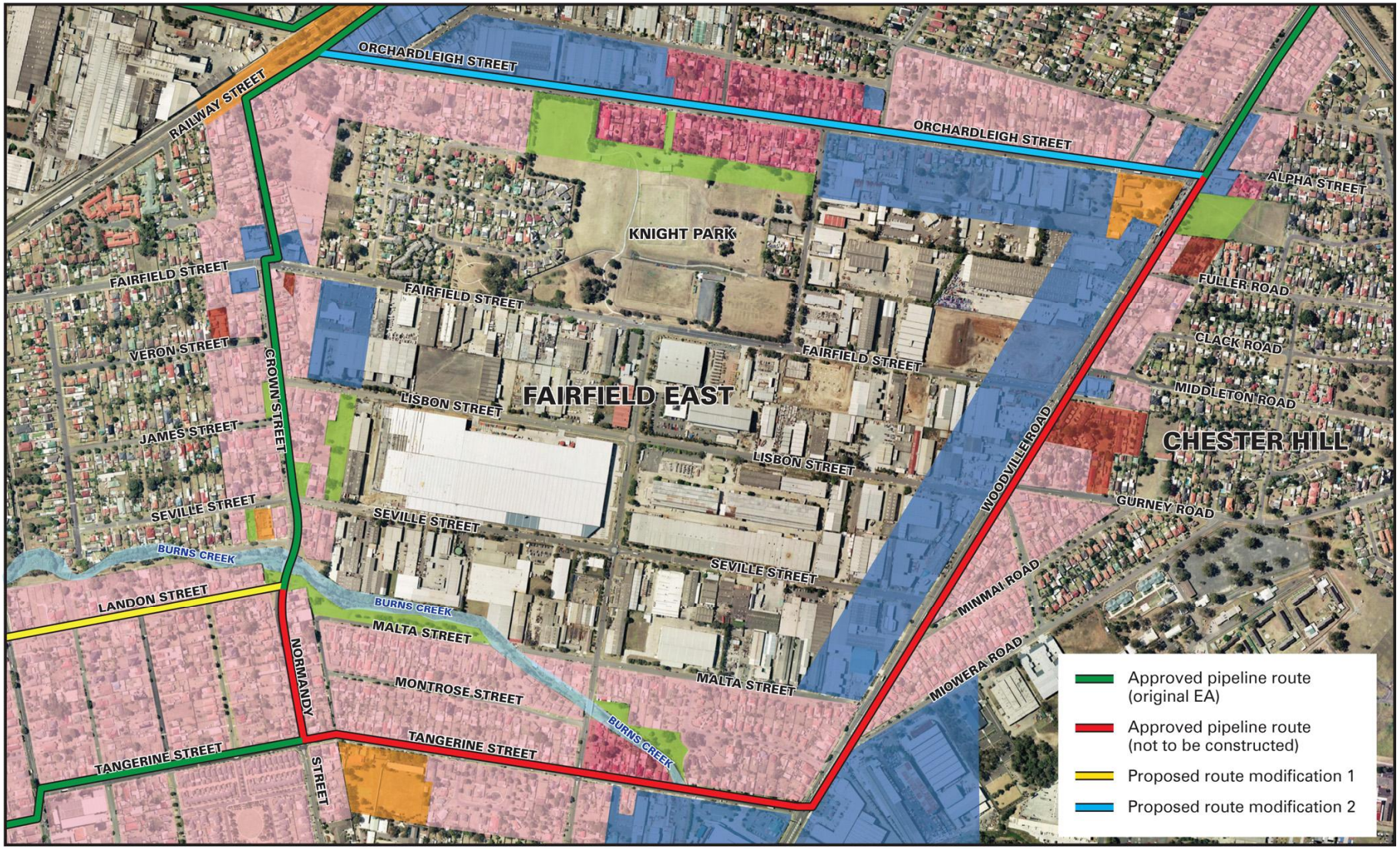

Figure 1 **Proposed modification 2 pipeline alignment and surrounding land use**

Figure 2 **Orchardleigh Street land use**

4.2 Adopted construction noise and vibration goals

Construction noise goals, detailed in Table 2, have been established in accordance with the ICNG, adopting a day time median average background noise level of 44 dB(A) L_{A90} determined during the NVIA baseline noise monitoring at Elizabeth Street.

The adopted receiver specific noise goals are design to minimise potential short-term disturbance to residents and occupants and preserve acoustic amenity at sensitive land uses. Where noise sensitive school and church receivers are not in use no construction noise goals would apply at the premises.

Table 1 Adopted construction noise goals

Receiver	Construction day time noise goal dB(A) $L_{Aeq, 15min}$
Residential dwellings	54
Commercial premises and land use	70
Yennora Public School classrooms	45 (internal)
Old Guildford Public School classrooms	45 (internal)
'Alaadin' childcare centre	45 (internal)
Guildford Arabic Baptist Church	45 (internal)
Knight Park	60

Construction works outside of standard day time construction hours of 7 am-6 pm are not expected on the modified route. In the event evening and night time construction works are required approval for would be sought from Council and the Department of Planning (DoP).

Vibration during construction works is likely to be an intermittent source associated with two main types of impact; disturbance at receivers and potential architectural/structural damage to buildings. Generally, if disturbance issues are controlled, there is limited potential for structural damage to buildings.

In accordance with CoA 2.1, the ICNG guidance adopts the *Environmental Noise Management Assessing Vibration: a technical guideline* (2006) has been adopted for the assessment of perceptible vibration as Vibration Dose Value (VDV). Although not specified in the ICNG, German Standard DIN 4150: Part 3-1986 guidance has been adopted to establish structural Peak Particle Velocity (PPV) vibration goals.

Adopted day time construction vibration goals are detailed in Table 3.

Table 2 Recommended intermittent vibration disturbance construction goals

Location	VDV $m/s^{1.75}$		PPV mm/s
	Preferred	Maximum	
Residences	0.2	0.4	5
Commercial and education institutions	0.4	0.8	10

4.3 Assessment of construction noise impacts

It has been assumed the proposed modification would require no variation in methodology for open trenching construction works as assessed in the NVIA. The road surface breaking works to prepare the trench are the dominant noise generating activity where a saw cutter, 20 ton excavator and road truck would be intermittently operational typically for the first hour of each day.

Upon completion of the road surface works the trench would be excavated, the pipe section installed and the trench back filled using the excavator. The road surface would then be reinstated using asphalt and a compactor and road truck. Table 4 details construction plant source sound power levels (SWL) adopted in the predictive assessment.

Table 4 Adopted construction plant source noise levels

Construction works	Adopted source SWL, dB(A)
Road surface works	
Saw cutter	108
Excavator	95
Road truck	108
Trenching and pipe installation	
Excavator	95
Road truck	108
Road reinstatement	
Compactor	96
Excavator	95
Road truck	108

Note: all noise levels in dB(A) to nearest dB(A)

Given the uniform topography in the study and the separation distances between the construction locations and nearest receivers, the noise impact assessment can be undertaken through the application of Equation 1.

$$SPL_{received} = SWL_{source} - 20\log(r) - 8 \qquad \textbf{Equation 1}$$

Where *SPL received* is the received sound pressure level, *SWL* is the source sound power level and *8 dB* is a constant, applied for the loss of acoustic energy resultant from hemi-spherical radiation of noise.

Predicted worst case construction noise impacts for the modified pipeline alignment at nearest receiver locations are detailed Table 5. The range of predicted noise impacts is indicative of peak noise generating works undertaken in proximity to receivers where all feasible construction plant are operational. Reduction in received noise levels would be achieved where fewer plant are in simultaneous operation and where works are carried out at greater separation distance to receivers.

For the assessment of internal noise impact at education institutions, the Alaadin childcare centre and Guildford Arabic Baptist Church, a 10 dB(A) reduction to predicted external noise impacts has been applied indicative of the threshold for noise reduction performance afforded where windows are open for ventilation.

Noise management and mitigation measures to where feasible reduce anticipated construction noise impacts and minimise potential for annoyance at nearest receivers, are recommended in Section 5

Table 3 Predicted day time construction noise impacts for proposed modified pipeline route

Location	Separation distance (m)	Construction noise level $L_{Aeq, 15min}$			Noise goal $L_{Aeq, 15min}$	Compliance		
		Road surface works	Trenching & installation	Road reinstatement		Road surface breaking	Trenching & installation	Road reinstatement
Residential dwellings	12 - 20	74 - 79	61 - 66	71 - 76	54	+ 20 - 25	+ 7 - 12	+ 17 - 22
Commercial premises	20 - 30	71 - 74	58 - 61	68 - 71	70	+ 1 - 4	Yes	+ 1
Yennora Public School	50	66	53	63	45 (internal)	+ 10	Yes	+ 8
Old Guildford Public School	50	66	53	63	45 (internal)	+ 10	Yes	+ 8
'Alaadin' childcare centre	20	74	61	71	45 (internal)	+ 19	+ 6	+ 16
Guildford Arabic Baptist Church	50	66	53	63	45 (internal)	+ 10	Yes	+ 8
Knight Park	30	71	58	68	60	+ 11	Yes	+ 8

Note all noise levels in dB(A) to nearest dB(A)

L_{Aeq} = Equivalent continuous (energy average) A-weighted sound pressure level, defined as the steady sound level that contains the same amount of acoustic energy as the corresponding time-varying sound

Residential dwellings

At nearest residential receivers proposed construction noise impacts are predicted to exceed the adopted 54 dB(A) $L_{Aeq, 15min}$ noise goal during road surface works, trenching and reinstatement and road reinstatement works.

Noise goal compliance is predicted approximately 200 metres from construction works. Adopting predicted noise impacts of up to 79 dB(A) $L_{Aeq, 15min}$ at nearest residences where no noise attenuation measures are installed, a maximum of 16 residential receivers are within 200 metres of the proposed pipeline construction works at any point in time.

Based on a typical pipeline construction rate of 30 metres per day, individual residential receivers are predicted to experience construction noise impacts in exceedance of the residential noise goal for approximately 6 days.

Noise sensitive receivers

At nearest noise sensitive school and church receivers predicted internal construction noise impacts of up to 56 dB(A) $L_{Aeq, 15min}$ during road surface works and 53 dB(A) $L_{Aeq, 15min}$ during road reinstatement potentially exceed the adopted 45 dB(A) $L_{Aeq, 15min}$ internal noise goal by up to 11 dB(A). Compliance with the internal noise goal is predicted during trenching and trench reinstatement works at all nearest noise sensitive receivers.

Noise goal compliance is predicted to be achieved where works are undertaken approximately 200 metres from nearest noise sensitive receivers. Exceedance of the adopted noise goal is predicted to potentially occur intermittently at individual receivers for approximately 6 days.

Where windows are closed a potential feasible noise reduction performance of up to 20 dB(A) would achieve noise goal compliance at all receivers during road reinstatement works. At individual receivers potential noise goal exceedance by 1 dB(A) during road surface works may occur for an estimated total period during the construction program of 2-4 hours where works are within 50 metres of the receiver.

Construction noise goals are applicable only where noise sensitive premises are in use; to minimise potential noise impacts works outside of standard hours may occasionally be required when the premises are not in use.

Commercial receivers

Predicted noise impacts of 58 - 74 dB(A) $L_{Aeq, 15min}$ potentially exceed the commercial receiver noise goal by up to 4 dB(A) during road surface works. Noise goal compliance is predicted at commercial receivers during all other construction works.

Noise goal compliance is predicted at approximately 40 metres from construction works. Based on the proposed rate of construction received noise impacts at nearest commercial premises may exceed the adopted noise goal for 2 - 4 hours per day for a typical duration of 2 days.

Recreational areas

Predicted construction noise impacts potentially exceed the 60 dB(A) $L_{Aeq, 15min}$ recreational amenity noise goal. Noise goal compliance is predicted to be achieved greater than 75 metres from construction works.

4.4 Construction vibration assessment

Consistent with the NVIA and minimum source to receiver separation distances of 12-20 metres, potential vibration levels from the proposed works are not expected to result in exceedance of perceptible and structural vibration criteria in the *Department of Environment and Climate Change and Water (formerly DECC) Environmental Noise Management Assessing Vibration: a technical guideline* (2006).

5. Recommended noise management and mitigation measures

Compliance with the adopted noise design goals is the desired outcome. Where it is identified that the required noise criteria would not be met, all reasonable and feasible measures would be undertaken to reduce the noise emissions.

Consistent with the predicted noise impacts a series of pre-construction and construction phase measures and management practices designed to mitigate and reduce noise levels are detailed in the NVIA. Measures include the development of a CNVMP to address noise levels associated with the construction works, maximising offset distance between noise generating plant and sensitive receivers and avoiding simultaneous operation of dominant noise generating plant.

Further to the NVIA the following management and mitigation measures have been recommended considerate of the noise sensitive receivers on Orchardleigh Road:

- Construction works should be where feasible, undertaken during day time standard hours of construction only. To reduce duration of noise generating activity and minimise potential noise impacts construction activity outside of standard construction hours may be undertaken adjacent to nearest noise sensitive schools and churches subject to Council and DoP approval
- in consultation with Yennora Public School and Old Guildford Public School construction works should be scheduled where feasible during school holidays and outside of examination periods. Where construction works are to occur during normal school hours dominant noise generating saw cutting works should be scheduled outside of teaching hours such as during lunchtime breaks and after 3 pm

6. Conclusion

The assessment of the modified construction program has determined proposed trenching works to potentially exceed an adopted day time construction noise goals at nearest residential, noise sensitive and commercial receivers. Construction noise management and mitigation measures consistent with the NVIA should be adopted during the detailed design phase to, where feasible, reduce noise impacts and achieve a desired objective of noise goal compliance.

Yours sincerely,

Steven Walker

Senior Environmental Acoustician
Parsons Brinckerhoff Australia Pty Limited

Appendix C

Revised noise and vibration impact assessment

Camellia and Rosehill Recycled Water Scheme

Modified Pipeline Route Traffic Impact Assessment

April 2010

Jemena Pty Ltd

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Revision	Details	Date	Amended By
00	Original		

Author: Ben Hubbard .....

Signed: .....

Reviewer: Zoran Bakovic .....

Signed: .....

Approved by: John Webster .....

Signed: .....

Date: 14 April 2010 .....

Distribution: 1 copy client, 1 copy file .....

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Glossary

LAP	Liverpool to Ashfield Pipeline
OHS	Occupational Health and Safety
HDD	Horizontal Directional Drilling
RWTP	Recycled Water Treatment Plant
TMP	Traffic Management Plan

Executive summary

The Camellia and Rosehill Recycled Water Scheme delivers part of the New South Wales Government Metropolitan Water Plan (2006).

This project includes:

- a recycled water treatment plant at Fairfield
- a connection to the Liverpool to Ashfield Pipeline
- approximately 20 km of primary recycled water pipeline
- off takes for 13 customers
- a surface water reservoir and a pumping station at the Shell refinery located off Durham Street
- an elevated reservoir at Woodville Golf Course on Barbers Road in Guildford.

Project approval for this project was granted by the Planning Minister on 1 June 2009.

This report updates the traffic impact assessment of the approved project to reflect a revised route for the recycled water pipeline. The revised route includes two Modifications to the recycled water pipeline on:

- Landon Street (referred to as Modification 1) connecting between The Horsley Drive and the approved pipeline alignment on Normandy Street. This alignment replaces the proposed alignment along Gordon Street and Tangerine Street west of Normandy Street and was assessed as part of a previous Modification approved on 1 April 2010
- Orchardleigh Street (referred to as Modification 2) connecting between the approved pipeline alignment on Railway Street and Woodville Road. This alignment replaces the approved alignment on Tangerine Street east of Normandy Street. The route has been modified to simplify construction and reduce traffic and transport impacts, in particular along Tangerine Street, which is a busy distributor road with one school and some bus routes. Orchardleigh Street is a less trafficked street than Tangerine Street, has more available on-street parking, so the impacts of construction would be less than in Tangerine Street.

This Traffic Impact Assessment has been prepared to assess the impacts of Modification 2. All the identified impacts would occur during the construction period. These impacts would be temporary and can all be managed. The construction impacts could include:

- localised narrowing of the road to provide for worksites. This should not impact on traffic movement as two lanes can be maintained for the entire length of the modified pipeline route
- loss of parking to provide for worksites. Parking spaces are readily available within Orchardleigh Street so the impact, of a temporary loss of parking to provide for work zones, should therefore be minimal during construction
- access to properties will be maintained during the construction phase by constructing the pipeline in sections and providing road plates to bridge any sections of open trench

- heavy vehicles will be managed so as to minimise their impact during construction. Heavy vehicle routes are suggested and will be defined, along with operating hours within a Traffic Management Plan. The impact from heavy vehicles is likely to be minimal

- cycling and walking impacts are likely to be minimal and are likely to comprise of localised diversions of footways to ensure pedestrians do not enter the worksites

- public buses use the section of Orchardleigh Street between Woodville Road and Donald Street. This is the only section of the modified pipeline route where buses operate. The construction of the pipeline would be programmed to minimise any impact on this bus service.

1. Introduction

The Camellia and Rosehill Recycled Water Scheme (the project) is part of the NSW Government's *Metropolitan Water Plan (2006)*. This project will treat and deliver recycled water to 13 customers located in Yennora, Smithfield, Guildford, Rosehill and Camellia. The project will be constructed to have sufficient capacity, so that once the approach is proven, further customers can be added in Liverpool, Wetherill Park and Parramatta/Westmead. The project will comprise of:

- a recycled water treatment plant (RWTP) at Fairfield
- a connection to the Liverpool to Ashfield Pipeline (LAP) which is currently under construction. The LAP will provide secondary effluent as the feed stock for the RWTP
- approximately 20 kilometres of primary recycled water main in public roads and road reserves within four local government areas, including 5 kilometres that would be inserted into isolated Alinta gas mains along Woodville Road between Fairfield and Granville
- off-takes from the recycled water main for the 13 customers
- a surface water reservoir and pumping station at the Shell Refinery site off Durham Street
- an elevated reservoir at Woodville Golf Course on Barbers Road at Guildford.

Project approval for the Camellia and Rosehill Recycled Water Scheme was granted, with conditions, by the Minister of Planning on the 1 June 2009.

Jemena Pty Ltd on behalf of Aquanet Pty Ltd is managing the delivery of the project and is now seeking approval from the Minister of Planning to modify part of the recycled water distribution pipeline alignment.

Jemena Pty Ltd is currently seeking to modify the existing route to Orchardleigh Street to avoid using part of Woodville Road and Tangerine Street which have a range of identified construction issues that are difficult to ameliorate.

1.1 Scope

This study assessed the likely traffic and transport impacts associated with the construction of the recycled water pipeline along the proposed modified route including the impact on through traffic, access to private dwellings and businesses and minimising safety risks for construction personnel and road users. Specifically the study considers:

- requirements for lane or road occupancy to carry out construction works and any associated impacts on road users including pedestrians, cyclists and public transport
- potential for vehicle and pedestrian access restriction
- concepts for traffic management and detour plans.

1.2 Structure of this report

This traffic impact assessment report comprises the following sections:

- Section 1: Introduction – provides an introduction to the project and outlines the scope of the assessment
- Section 2: Proposed works – provides a description of the proposed works activity including the site location and details of the construction process
- Section 3: Traffic impacts during construction – describes the construction methodology and likely associated impact on traffic, transport access and parking along the modified pipeline route
- Section 4: traffic impact during operation – briefly describes the operational impact of the modified pipeline route
- Section 5: Mitigation measures – summarises measures proposed to manage impacts identified in section 3
- Section 6: Key findings and conclusions – provides a summary of the issues detailed in the report and a conclusion

2. Proposed works

The proposed modification adds approximately 1.6 km of pipeline between Railway Parade and Woodville Road along Orchardleigh Street and removes the need for approximately 2.5 km of pipeline no longer required to be constructed along the southern part of the overall scheme along Normanby Street, Tangerine Street and the section of Woodville Road between Tangerine Street and Orchardleigh Street.

The pipeline would vary in diameter between approximately 400 mm and 450 mm and is consistent with the currently approved pipeline traversing Tangerine Street.

The proposed pipeline would be constructed using the open trench method. The modified pipeline route would start at the Orchardleigh Street/Railway Street intersection. This section of the pipeline would connect to the approved pipeline along Railway Street and forms part of the 'Smithfield Spur' section of the overall approved scheme. The pipeline would generally follow the southern side of Orchardleigh Street for the whole length of Orchardleigh Street within the road reservation.

The modification has been proposed to avoid using part of Woodville Road which has identified a range of construction issues that are difficult to ameliorate. The proposed route of the modified pipeline route is shown in Figure 2.1.

Generally, only one construction method would be used along the proposed modified route which would impact on roadways or create access issues for existing properties. The primary construction method to be used would be open trench construction and this method has various limitations and impact on traffic and transport. This method is discussed within the following section.

2.1 Open trench construction

Most of the proposed pipeline, along the modified route, is to be constructed using an open trench construction method that includes: trench excavation, placement of a pipe bedding material, installation of pipe, pressure testing of the pipe, back filling of the trench with a suitable fill material, compaction of fill material, formation of the road and road surfacing. Excavated material will be removed to a temporary stockpile off the site where it will be graded for use as fill material.

The construction of the pipeline is likely to require either lane or road closures, depending on the position and depth of the pipeline. These closures will provide a safe working area for construction personnel and separate construction personnel and plant from other road users. All full closures of the road will require a suitable detour to be provided. Lane closures may require temporary speed limits and parking restrictions.

Access to properties will be maintained throughout the duration of the works by completing the pipeline in sections with the road reinstated for access (this may be a temporary reinstatement) at the end of each working day. Steel road-plates, that can be used to temporarily bridge an open trench, will be available on site to provide access for businesses and to provide access in an emergency.

The pipeline will be progressed on a 'block by block' basis to minimise the disruption to the public and to provide a consistent temporary traffic management regime for road users.

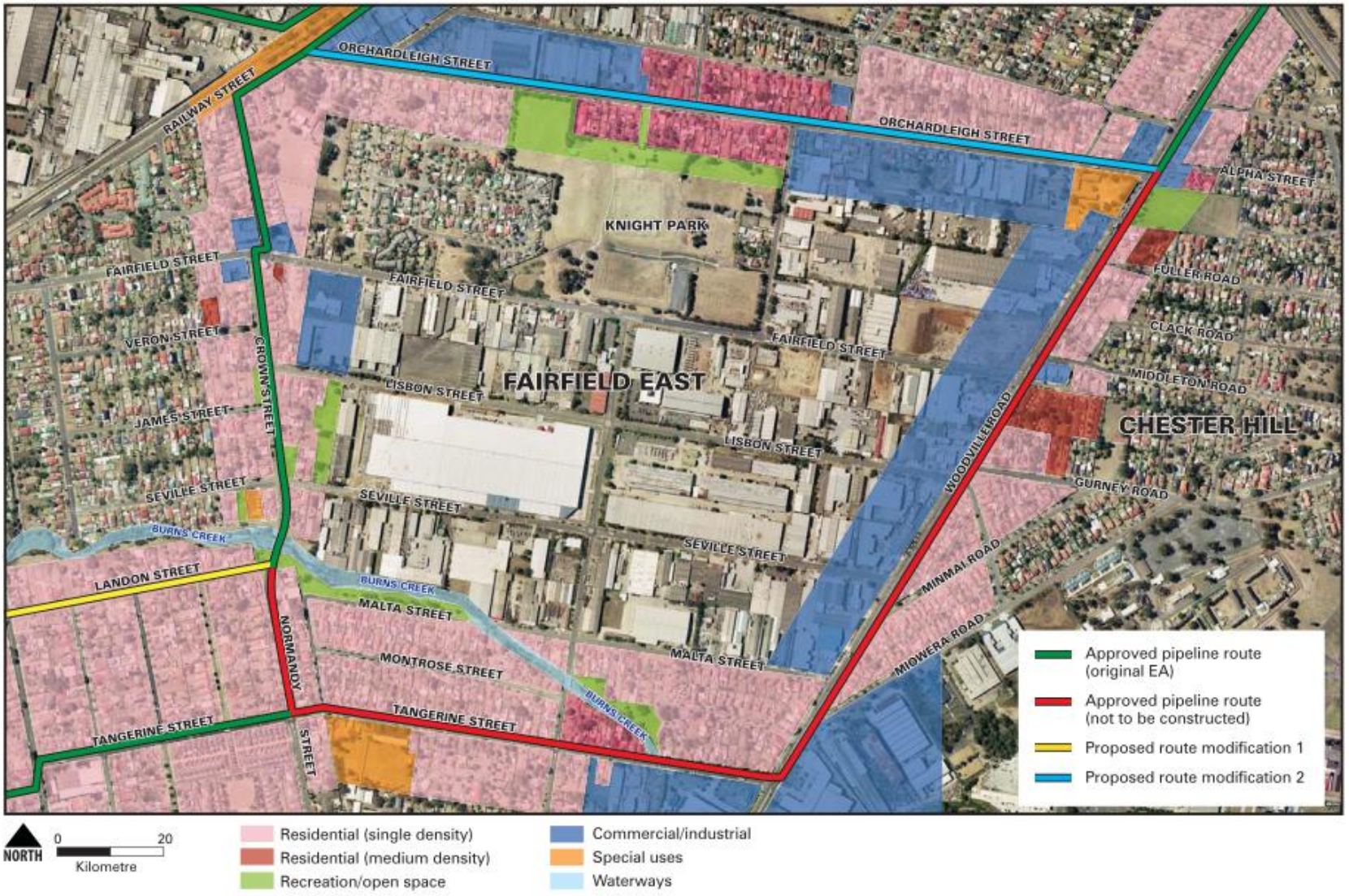

Figure 2.1 The proposed modified route (Modification 2)

3. Traffic impacts during construction

3.1 Orchardleigh Street/Railway Street intersection

The proposed pipeline on Orchardleigh Street would connect with the approved pipeline alignment at the Railway Street/Orchardleigh Street intersection.

The Railway Street/Orchardleigh Street intersection is signalised and includes pedestrian crossings on the Railway Street western approach and on the Orchardleigh Street approach. These pedestrian crossings are located on important access routes to the Yennora Railway Station.

The construction of this pipeline connection would be by the open trench method and would likely require a partial closure of Railway Street and Orchardleigh Street. Detour routes for vehicular traffic affected by this partial closure could be provided via the local road network to the east of Railway Parade (if required).

To minimise the construction impact on pedestrian and cyclists, consideration would be given to maintaining the existing pedestrian facilities during the construction period. This would be detailed in the revised Traffic Management Plan and associated Traffic Control Plans.

The Traffic Management Plan will need to include Traffic Control Plans that detail the signing and guarding needed to maintain road safety during the construction period.

3.2 Orchardleigh Street from Railway Street to Woodville Road

Both sides of Orchardleigh Street consist of a mix of residential and commercial properties. The street serves approximately 105 houses, 20 commercial properties and two schools. The street has low traffic volumes and a posted speed limit of 50 km/h except adjacent to the schools where a 40 km/h school zone speed limit operates between 8:00 am and 9:30 am and 2:30 pm and 4:00 pm during school days. This street is approximately 14 metres wide with a three metre wide grass verge either side of the carriageway.

A scheduled public bus service (route 609) operates on Orchardleigh Street between Woodville Road and Donald Street, with a service frequency of two buses per hour Monday to Saturday. In addition, a number of school buses operate serving the schools at either end of Orchardleigh Street.

The pipeline would be installed, on the southern side of the street between Railway Street and Woodville Road. The construction would use the open trench method and require a work space approximately 5 metres wide and up to 100 metres in length. This work site could be provided by using the parking lane on the southern side while maintaining two 3 metres wide traffic lanes and the parking lane on the northern side.

The majority of properties on Orchardleigh Street have off-street parking so on-street parking spaces are available on both sides of the street for the majority of its length. Any vehicles temporarily displaced by the construction works in this street are likely to be able to find parking spaces elsewhere in the street. Accesses to all properties will be maintained at all times by using road plates (where required).

The pipeline will need to pass intersections with side roads off Orchardleigh Street at Matthes Street and Donald Street. At these intersections the pipeline will need to be constructed in to two sections so that a minimum road width of 3.5 metres is maintained. Traffic control will be required at each of these intersections and will need to be detailed within Traffic Control Plans. The pipeline crossing at the Orchardleigh Street/Donald Street intersection will also need to consider providing for bus movements into and out of this street.

Construction activity along Orchardleigh Street would consider the bus stop and zebra crossing located approximately 50 metres west of Church Street. These facilities would be maintained during the construction period to minimise impact on bus users and pedestrians.

The Traffic Management Plan will need to include Traffic Control Plans that detail the signing and guarding needed to maintain road safety during the construction period.

4. Traffic Impacts during operation

Once the pipeline is completed, the only impact on traffic and transportation likely to occur would be to facilitate essential maintenance. For a newly installed pipeline this is expected to be minimal so the operational impacts of the modified pipeline route on traffic and transportation should be considered negligible.

5. Mitigation and control measures

Table 5.1 summarised the likely impacts that could occur during the construction of the pipeline along the modified route and provides mitigating measures and controls to address each impact.

Table 5.1 Table of traffic and transport impact and mitigation measures

Section/location	Impact	Mitigation and control measures
Orchardleigh Street/Railway Street intersection	▪ partial road closure of Railway Street and Orchardleigh Street ▪ delays to traffic ▪ additional number of heavy vehicles using the street.	▪ the construction will require the partial closure of both Railway Street and Orchardleigh Street. The extent of the partial closure will be minimised by the design of the pipeline alignment at this location. Detour routes can be provided via residential streets to the east of the Railway Street and would be detailed within Traffic Control Plans as part of the Traffic Management Plan ▪ the preferred route for heavy vehicles will be via Woodville Road and Orchardleigh Street so increased heavy vehicles due to construction should be minimal and would not have an impact ▪ road plates, pedestrian signing and barrier will be available for use during the construction of the pipeline past the signalised pedestrian crossings on Railway Street and Orchardleigh Street. This will minimise the impact on pedestrians at these crossings.
Orchardleigh Street	▪ closure of the sections of the parking lane on the southern side of Orchardleigh Street. Two-way traffic will be maintained at all times along with the parking on the north side of the street ▪ additional number of heavy vehicles using the street ▪ partial road closures at side road intersections including the Orchardleigh Street/Matthes Street intersection and the Orchardleigh Street/Donald Street intersection.	▪ the pipeline will be constructed progressively in sections and, where practical; these sections will avoid blocking vehicle access to the properties ▪ where access cannot be maintained, steel road plates will be used to bridge the open trenches and to provide temporary access ▪ heavy vehicles will be routed via Woodville Road and Orchardleigh Street ▪ the times of deliveries and removal of spoil from the site would be managed to avoid the traffic peak hours and school start and finish times ▪ vehicles parked within this road section would need to be temporarily relocated to other parts of Orchardleigh Street where construction is not taking place. Some spaces are available elsewhere in Orchardleigh Street ▪ where the pipe line passes side roads at Matthes Street and Donald Street site specific Traffic management Plans will need to be prepared. The pipeline will be constructed in two sections so that a minimum road width of 3.5 m is maintained to allow traffic access to be maintained without the need for a detour ▪ during the construction of the pipeline past the zebra crossing, road plates and pedestrian barrier will be used so that this facility is maintained ▪ public buses operate with a half hour frequency between approximately 6:00 am and 7:00 pm on Orchardleigh Street between Woodville Road and Donald Street. The construction of the pipeline past this intersection will need to minimise impacts on bus operations.

6. Summary and conclusions

This Traffic Impact Assessment considers the likely traffic and transport impact of a modified route for the approved recycled water pipeline as part of the Rosehill Recycled Water Scheme project.

The Modification has been proposed to avoid using part of Woodville Road and Tangerine Street which have a range of construction issues that are difficult to ameliorate. The proposed route is shown in Figure 2.1.

6.1 Operational impacts

After completion of the pipeline, impact on traffic and transport is expected to occur only in the event of routine or emergency maintenance.

6.2 Construction impacts

Several impacts on traffic and transport have been identified, all are manageable and temporary:

- localised reduction in road width. Road width will need to be reduced along Orchardleigh Street where the recycled pipeline is proposed to be installed by the open trench method. For the open trench method, a construction zone of approximately 5 m in width will be needed. Generally, two lanes of 3.0 m width on Orchardleigh Street can be maintained along the entire length of these streets. The disruption to traffic should be minimal as two lanes should be maintained for the duration of the works

- the work zone will require relocation of some parking. Generally, residents of Orchardleigh Street do park off road so the impact would be minimal. As parking is available elsewhere in Orchardleigh Street and as the pipeline is to be progressed on a block by block basis the impact of loss of parking would be minor

- temporary loss of access to the properties. The loss of access can be managed by coordinating the construction with the property owner and having steel road plates on the site to temporarily bridge the pipe trench to allow access

- redirection of pedestrians where the work site includes parts of the footpath. The redirection of pedestrians will be required at several locations along Orchardleigh Street. This will need to be managed with signing and guarding which would be detailed in a Traffic Control Plan. The number of pedestrians observed using Orchardleigh Street was low so the impact on pedestrians will be minor

- increase in the number of heavy vehicles during the construction period. Construction traffic will be managed by a TMP that will specify heavy vehicle routes and times of operation. The additional volumes of heavy vehicles will be managed so that the impact of these vehicles is minor

- Orchardleigh Street between Woodville Road and Donald Street is used by a scheduled public bus service with an approximately 30 minute frequency between 6:00 am and 7:00 pm. This is the only section of the modified pipeline route where buses operate.

7. References

Roads and Traffic Authority NSW 2006, *Traffic control at Worksites*

Appendix D

Correspondence from Fairfield City Council

FairfieldCity
Celebrating diversity

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In reply please quote:09/00004
Your Ref: 2117094B/LT_2048/JB/mm

Contact: Brian Long on 9725 0857

18
14 May 2010

Parsons Brinckerhoff Australia
GPO Box 5394
Sydney NSW 2001

Attention: Jarryd Barton

Dear Sir

ENVIRONMENTAL ASSESSMENT FOR THE MODIFICATION TO THE CAMELLIA AND ROSEHILL RECYCLED WATER PROJECT MODIFICATION 2

Further to the documents submitted for comment prior to the modification being submitted to the Department of Planning I confirm that the only matter of concern to Council is the potential impact on recently upgraded roadwork.

The areas of concern are Landon Street, one section of Crown Street and Ellis Parade which have relatively new pavements and the proposed work may have detrimental effect on pavement condition and performance.

It will be necessary to liaise with Councils to ensure restoration works meet the Council's requirements.

Should you require further information please contact me.

Brian Long
Senior Policy Advisor Open Space and Recreation

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