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 modifications to the existing project approval. The following sections summarise the relevant legislation and its applicability to the modifications proposed to the approved Project.

3.2 Local environmental plan

The modifications to the project are located in the Fairfield and Parramatta local government areas. The relevant provisions of the local environmental plans (LEPs) for these two local government areas are discussed the following sections.

3.2.1 Fairfield Local Environmental Plan 1994

Modifications 1, 2 and 4 are located within the Fairfield local government area. Under the Fairfield Local Environment Plan 1994 (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 modifications are consistent with the definition of a utility installation for the purposes of the Fairfield LEP and are, 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.

3.2.2 Parramatta Local Environmental Plan 2001

Modifications 5 and 6 are located within the Parramatta local government area. The Parramatta Local Environmental Plan 2001 (Parramatta LEP) provides that public utility installations (other than gas holders and generating works) are permissible with consent in all land use zonings. Modification 5 (Woodville reservoir) is within the provisions of the Parramatta LEP, while modification 6 (Rosehill reservoir) falls within the provisions of Sydney Regional Environmental Plan 28 – Parramatta (SREP 28) (refer Section 3.2.3).

The Parramatta LEP defines public utility undertakings to include:

> any undertaking carried on by, or under the authority of, any Commonwealth or State Government department or agency, or pursuant to any Commonwealth or State Act, for the purpose of:
>
> (a) railway, light railway, road, water or air transport, or wharf or river undertakings, or
>
> (b) the provision of sewerage or drainage services, or
>
> (c) the supply of water, hydraulic power, electricity or gas, or
>
> (d) telecommunications facilities.

The proposed modification of the Woodville reservoir (modification 5) is, therefore, considered to be a public utility undertaking for the purposes of the Parramatta LEP and is permissible with consent in all land use zones within the Parramatta local government area. In addition, the project is consistent with the combined objectives of the land use zones in the Parramatta LEP.

3.2.3 Sydney Regional Environmental Plan No. 28 – Parramatta

SREP 28 applies to parts of the Parramatta and Holroyd local government areas, including sections of the project located in Rosehill and Camellia. The modification to the Rosehill reservoir (Modification 6), which falls within the provisions of SREP 28, is of particular relevance to the proposed modifications.

SREP 28 defines a public utility installation as an undertaking for the purposes of providing sewerage services or water that is carried on pursuant to a Commonwealth or State Act. As the works are proposed to be conducted pursuant to the *Water Industry Competition Act 2006*, the project is considered to be a public utility installation for the purposes of SREP 28.

Under SREP 28, public utility installations are permissible with the Regional Enterprise Zone in which the works are proposed.

3.3 Owners consent

3.3.1 Fairfield RWTP transformer modification

The land for the Fairfield RWTP (Lots 7–16, Section 1, DP 2728) has been bought from SWC and is vested with SPI Rosehill Networks Pty Ltd, a division of Jemena Limited. As AquaNet Sydney is also a division of Jemena Ltd, the project modification proponent, it is authorised to act on behalf of SPI Rosehill Networks Pty Ltd.

No formal landowner consent is, therefore, required to lodge this project modification request with respect to the modification to the location of the electricity transformers at the Fairfield RWTP.

3.3.2 Recycled water pipeline route modification

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 a '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 with respect to any proposed changes to the distribution pipeline.

3.3.3 Sewer connection line modification

SWC have been consulted in the design and route selection for the sewer connection line that traverses Sydney Water land. The sewer connection line is part of the Rosehill and Camellia Recycled Water Project - Project Agreement, governing the construction of the sewer connection line, (known as Plant Trade Waste Discharge Pipeline in the contract) signed 11 August 2008.

3.3.4 Reservoir site modifications

Landowner consent for the two reservoir sites have been received from the relevant land owners for the proposed modifications (attached as Appendix F).

4. Environmental assessment and mitigation measures

4.1 Summary of environmental impact changes

This section compares the potential impacts of the proposed modifications 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 biodiversity and waste management. Table 4-1 summarises the potential changes in environmental impacts associated with the proposed modifications. Additional detail is provided in Sections 4.2 to 4.10.

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

Aspect of impact	Potential environmental impact	Details of impacts
Traffic and transport	The modified pipeline route has been developed to avoid using part of Tangerine Street, a busy residential street including a school, a small amount of businesses, several roundabouts and a bus route.	Section 4.2
	The modified route would use the less busy road of Landon Street instead of part of Tangerine Street and Gordon Street.	
	The modified route would result in similar impacts as the approved Project, requiring crossings of Horsley Drive and Burns Creek	
Noise	The modified construction program has determined that the proposed trenching works could slightly exceed adopted daytime noise goals at the nearest receivers during construction. Compliance at all receivers and land uses is predicted during HDD and thrust boring works.	Section 4.3
	Compliance with an adopted noise goals is predicted to be achieved at all receivers for transformer operations.	
Flora and fauna	The modifications are located in a highly urbanised landscape. The majority of the modifications proposed would traverse roads, existing pipeline easements, and residential/industrial areas that generally lack native vegetation or important fauna habitat features.	Section 4.4
	The modifications to the project do not require clearing native vegetation that comprises threatened ecological communities or vegetation that provides habitat for threatened flora or fauna species.	
Land use and parklands	The land uses along the proposed new recycled pipeline route are similar to those impacted by the approved pipeline. The number of residential land uses would reduce slightly and the number of commercial and industrial properties would slightly increase.	Section 4.5
	Minimal impacts to the existing land uses are expected to occur as a result of installing the sewer connection line.	
Waste generation and management	The proposed modifications are anticipated to generate a similar amount of waste to the approved Project design scheme.	Section 4.6

Soil contamination	Previous assessments of soil contamination within the area of the proposed modifications did not identify any soil contamination, acid sulfate soils or groundwater impacts. The proposed modifications are unlikely to encounter any areas with potential impacts.	Section 4.7
Water quality	The modified pipeline route would continue to cross Prospect Creek and Burns Creek. 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 currently proposed.	Section 4.8
Hazards and risk	An updated environmental risk analysis has been made. 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 made. Some positive benefits have been identified, including reduced traffic impacts and reduced vegetation clearing within the project area.	Section 4.10
Telecommunications	Aboveground utility and telecommunication services generally occur within the identified streets of the modified pipeline route. The pipeline would use open trench construction techniques within the street corridors and is not expected to affect these services.	Section 4.11
Consultation	Additional consultation has been undertaken throughout the modification environmental assessment process. Consultation with residents along the modified pipeline route and within the vicinity of the modified reservoir sites has been undertaken. It is envisaged that the proposed modifications will not have a significant affects on resident within the vicinity of the proposed modified works.	Section 5

4.2 Traffic and access

This section summarises the impacts of the proposed modifications to the traffic and transport environment identified within the approved Project EA. The assessment of traffic impacts mainly relates to the modification of the route alignment. 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 *Traffic Impact Assessment* to assess the impact of the proposed modifications to the approved Project on traffic and transport nearby these modifications. The revised *Traffic Impact Assessment* has been provided as Appendix C.

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, lane closures 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 Tangerine Street, which is a busy residential road with a bus route, several small businesses and a school. Tangerine Street also has several roundabouts that would make open trench construction more difficult. The impacts of the proposed modifications are described below with reference to their localised impacts along the modified route.

Landon Street HDD receiving area

The section of Landon Street west of Campbell Street ends as a cul-de-sac for vehicular traffic. An HDD receiving pit would need to be constructed at the end of Landon Street to receive the pipeline drilled from Makepeace Oval under Prospect Creek and Burns Creeks. It is proposed to construct the receiving pit at the same location as the receiving pit for the LAP so as to minimise the road reconstruction needed once the pipe line is installed.

It is estimated the modification would affect an area approximately half the width of the road and approximately 30 m long for use as a work site. A width of 3.5 m could be maintained at all times for access to the property at the end of the street. The road reserve verge area would also be unaffected and could provide access for pedestrians and cyclists towards Horsley Avenue. The modification may also displace some vehicle parking spaces within Landon Street; however, the street has been identified as containing ample parking capacity resulting in a minimal impact.

Landon Street — from north of Horsley Drive to Normanby Street

Landon Street north of Horsley Drive to Normanby Street is a residential street serving approximately 38 houses. It is proposed to install the pipeline on the northern side of the street and link it with the pipe installed by HDD. The pipe would be installed using an open trench method requiring a work space approximately 5 m wide. Two traffic lanes 3.5 m wide would be maintained to allow access to the properties. At the Campbell Street, Hercules Street and Loftus Street intersections with Landon Street the construction of the pipeline would be staged to allow for full traffic movement in all directions, minimising the impact of the works in these locations.

The modification may also displace some vehicle parking spaces within Landon Street; however, the street has been identified as containing ample parking capacity resulting in a minimal impact. The modified pipeline would then connect to the approved pipeline which runs along Normanby Street.

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 modifications.

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 *Traffic and Transport Impact Assessment* (refer Appendix C):

- Some temporary loss of access to the properties may be experienced as a result of the pipeline construction. The loss of access would 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.
- Some road width would need to be reduced along Landon Street where it is proposed to install the recycled pipeline using the open trench method. Where practical, the pipeline would be constructed progressively in sections to avoid a large section of the streets being disrupted at any given time. This would also avoid obstructing vehicle access to the properties for any significant period of time.
- The times of deliveries and removal of spoil from the site would be managed such to avoid the traffic peak hours and school start and finish times
- Each of the work zones would require relocating some parking. Generally, residents of Landon Street do not park on the road, so the impact would be minimal. Vehicles that park within Landon Street would need to be temporarily relocated to existing side streets. The removal of parking at these locations may have some impact, but this should be minor as parking is available nearby.
- Pedestrians would have to be redirected at several locations along Landon Street. This would be managed with signs and guarding. The number of pedestrians observed using Landon Street was low so the disturbance to pedestrians is expected to be minor.
- Construction traffic would be managed through a traffic management plan that would specify heavy vehicle routes and times of operation. The additional volumes of heavy vehicles would be managed so the impact of these vehicles is minor.

4.3 Noise

This section summarises the impacts of the proposed modifications to the existing approved noise criteria established in the approved Project EA. The assessment of the noise impacts relate to the proposed modification of the route alignment for the recycled water pipeline and relocation of the transformers within the Fairfield RWTP.

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 proposed impacts of the project were assessed through the preparation of a *Noise and Vibration Impact Assessment* (Technical Paper 2 of the approved Project EA). A revised *Noise and Vibration Impact Assessment* has been prepared by PB (November 2009) to assess the impact of the proposed modifications to the approved Project with respect to noise and vibration.

Further details of the potential noise impacts of the proposed modifications are provided in the revised *Noise and Vibration Impact Assessment* attached as Appendix D.

Recycled water pipeline modification

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.

Table 4-2 summarises the principal findings from the approved Project EA for the section of recycled water pipeline that is proposed to be modified.

Table 4-2 Summary of predicted excavation construction noise levels between Fairfield Park and Normanby Street

Location	Distance to nearest receptor (m)	Construction L_{A10} noise level dB(A)		
		Predicted	Criterion	Compliance
McIntosh Street	12	75.5–85.5	64	No (+11.5–21.5)
Gordon Street	12	75.5–85.5	68	No (+7.5–17.5)
Hercules Street	25	69–79	64	No (+5–15)
Tangerine Street	12	75.5–85.5	68	No (+7.5–17.5)
Tangerine Street	20	70–80	68	No (+2–12)

Note All noise levels in dB(A) to nearest 0.5 dB(A).

L_{A10} = A-weighted sound pressure level exceeded for 10% of the time.

As it can be seen, noise levels from excavation works, inclusive of saw cutting operations, were predicted to be up to 85.5 dB(A) $L_{A10\ 15\ mins}$ at the nearest receptors. Where the saw cutter was not to be in operation, an approximate 10 dB(A) reduction in received noise levels was predicted.

The approved Project EA 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.

Fairfield RWTP transformers

The approved Fairfield RWTP and North Street, Fairfield included two 1500 kVA and one 500 kVA transformers. As described in Section 2.4, it is now proposed to upgrade the transformer configuration to three 1500 kVA transformers. The noise levels associated with the construction of the proposed Fairfield RWTP, reservoir and pumping station, and Woodville reservoir at the nearest potentially affected residential receptors were also detailed in the approved Project EA.

The *Noise and Vibration Impact Assessment* for the approved Project EA detailed the predicted operational noise levels associated with the proposed Fairfield RWTP. Table 4-3 summarises the findings from the assessment of the approved design of the Fairfield RWTP.

Table 4-3 Operational noise level assessment

Location	Distance to site (m)	Predicted received noise level	Noise criterion	Compliance
6 North Street	95	43.5	40	No (+3.5)
8 North Street	90	44	40	No (+4)
10 North Street	135	40	40	Yes
1 Lyndon Street	150	39.5	40	Yes
Railway Parade	150	39.5	40	Yes

Notes: Values expressed as dB(A), to nearest 0.5 dB(A).

Overall, noise was generally expected to be intermittent in nature and the pumping station was not expected to influence the local noise environment throughout the daytime, evening and night-time. For the nearest properties, 6 and 8 North Street, a potential exceedance of the amenity noise goal of up to 4 dB(A) was predicted.

4.3.2 Assessment of modified project impacts

Recycled water pipeline modification

Nearest residential receivers are located within 12 – 20 metres of the proposed pipeline alignment on Langdon Street. No noise sensitive (education institutions, places of worship etc.) or commercial receivers have been identified within 100 metres of the alignment modification.

It has been assumed the proposed modification would require no variation in methodology for trenching, pipe bore, HDD and thrust bore construction works, as previously described in the approved Project EA. Table 4-4 identifies the predicted construction noise impacts for the modified pipeline alignment at nearest receiver locations.

Table 4-4 Summary of predicted excavation construction noise levels between Fairfield Park and Normanby Street resulting from proposed route alignment

Location	Construction work	Distance to nearest receptor (m)	Construction $L_{A10,\ 15\ min}$ noise level, dB(A)	
			Predicted	Compliance
Construction day time noise goal 68 dB(A) $L_{A10,\ 15\ min}$				
Vine Street	Thrust bore	125	33.5	Yes
Prospect Creek and Burns Creek	HDD	20	57	Yes
The Horsley Drive	HDD	20	57	Yes
Landon Street	Trenching	12–20	70–65.5	No +2

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

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

Predicted worst case noise impacts of 63-67 dB(A) $L_{Aeq,\ 15min}$ during trenching construction works on Landon Street are potentially up to 13 dB(A) in exceedance of the adopted 54dB(A) $L_{A1eq,\ 15min}$ construction noise goal. Compliance is expected to be achieved where nearest receivers are location at a minimum separation distance of 60 metres from work locations. Reductions to worst case noise impacts would occur where construction works progress along the alignment and fewer plant are in concurrent operation.

Predicted noise impacts at nearest receivers of 54 dB(A) for HDD and 31 dB(A) thrust bore construction works are expected to be compliant with the adopted construction noise goal.Where compliance with adopted construction nose goal is achieved at nearest residential receivers compliance with commercial noise goal is expected at nearest commercial land uses.

It was considered in the approved Project EA that approximately 20 properties within 100 m of the construction work sites may be affected by elevated noise levels for a typical duration of two consecutive days at any given point along the pipeline route. This is not expected to change as a result of the realignment of the pipeline route away from Gordon Street and part of Tangerine Street.

Fairfield RWTP transformers

Predicted operational noise impacts were determined based on the uniform local topography and the separation distance between the proposed transformers and nearest receivers. Predicted operational noise impacts for the proposed transformer configuration were determined adopting predicted RWTP noise impacts from the original *Noise and Vibration Impact Assessment* prepared for the approved Project EA. A worst-case operational scenario of the three transformers in concurrent operation has been assessed. The results of the proposed modification are detailed in Table 4-5.

Table 4-5 Operational noise level assessment

Location	Distance to site (m)	Noise impacts $L_{Aeq,15\ min}$ dB(A)			
		3 x 1500 kVa transformers	RWTP	Cumulative transformers and RWTP	Noise goal compliance
Operational noise goal 40 dB(A) $L_{Aeq,\ 15min}$					
2 North Street	70	26	36	36.5	Yes
6 North Street	75	25.5	35.5	36	Yes
8 North Street	85	24.5	35	35.5	Yes
10 North Street	140	20	30	30.5	Yes
1 Lyndon Street	150	19.5	29.5	30	Yes
Railway Parade	85	34.5	44.5	45	No + 5

Notes: Values expressed as dB(A), to nearest 0.5 dB(A).

The operation of the three 1500 kVa transformers is predicted to result in received noise impacts of 19.5–34.5 dB(A) $L_{Aeq,\ 15\ min}$ at the nearest receivers. Transformer operations are compliant with the adopted 40 dB(A) $L_{Aeq,\ 15\ min}$ operational noise goal at all receivers.

Where the transformers are in concurrent operation with the RWTP, received noise impacts of 30.5–45 dB(A) $L_{Aeq,\ 15\ min}$ are predicted at the nearest receivers. The operation of the three transformers potentially increases cumulative transformer and RWTP noise impacts by up to 0.5 dB(A). The transformers would not be expected to be audible above the dominant Fairfield RWTP operations at the nearest receivers.

4.3.3 Mitigation and management measures

Predicted noise impacts for the modified construction works are predicted to potentially exceed an adopted day time noise goal of 54 dB(A) $L_{Aeq,\ 15min}$ at nearest noise sensitive residential receivers by up to 13 dB(A) during trenching works. Compliance with the adopted criteria is expected at all receivers and land uses during proposed HDD and thrust core construction works.

Consistent with the detailed construction noise impact assessment made as part of the approved Project EA, a series of pre-construction and construction phase measures and management practices designed to mitigate and reduce noise levels were detailed in the approved Project EA. These measures are still considered to be appropriate with respect to the proposed modifications. The measures relevant to the works associated with the proposed modifications are summarised below.

Pre-construction noise and vibration level management:

- Formulating construction noise management measures as part of the revised construction environmental management plan to provide a framework for addressing noise levels associated with construction works.
- Adopting 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.
- Maximising the offset distance between noisy plant items and sensitive receivers and orienting equipment away from sensitive receivers.
- Avoiding, where practical, simultaneous use of noisy plant and use of noisy plant adjacent to sensitive receivers.
- Providing information to potentially affected local residents before noisy activities begin. Construction methods, duration and timing of events would be outlined during this process.
- Displaying appropriate signs at temporary and permanent construction sites, including project details and relevant contact details for public information and enquiry.
- Scheduling 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:

- Residential class mufflers, and where applicable, engine shrouds (acoustic lining) would be used. All equipment would be maintained in good order, including mufflers, enclosures and bearings to ensure unnecessary noise emissions are eliminated.
- Construction activities would take place in accordance with Australian Standard AS 2436-1981 *Guide to Noise Control on Construction, Maintenance and Demolition Sites*. All equipment used on site would be required to demonstrate 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. Any excessively loud activities should be scheduled during periods of the day when general ambient noise levels are greatest.
- Engines would not be started and on-site activities (including entry or departure from the site) would not occur outside of the specified construction hours.
- Regular maintenance would take place on all plant and machinery used throughout the constructions works.

- If required due to complaints or if otherwise deemed necessary, noise monitoring programs would be adopted at the closest residences to the Fairfield RWTP to monitor noise levels against goals and identify the need for additional attenuation measures, such as localised screening and enclosures or solid boundary fencing.

In addition, construction working hours would be restricted to those provided in the project Approval Condition 2.2 *Construction Noise*, which generally requires construction works associated with the project that would generate noise audible at nearest sensitive receivers and at any residential receiver to take place 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.

4.4 Flora and fauna

This section summarises the impacts of the proposed modifications to the existing biodiversity impacts assessed within the approved Project EA. Assessment of the potential biodiversity impacts of the proposed modification mainly relates to three of the modifications:

- Modification 1 — realignment of the recycled water pipeline
- Modification 4 — water recycling plant sewer connection line
- Modification 5 — Woodville reservoir modification.

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). PB has made a revised assessment of biodiversity (November 2009) to assess the potential impacts of the proposed modifications to the approved Project. The revised biodiversity assessment is attached as Appendix E and provides greater detail of the potential biodiversity impacts of the proposed modifications.

4.4.1 Summary of approved Project impacts

The biodiversity survey and assessment previously identified biodiversity values (remnant vegetation communities, native flora or fauna habitat, drainage lines and threatened species) throughout various locations of the study area. Of importance to the proposed modifications, these locations included the following sites:

- Fairfield Park, Fairfield — native vegetation, Prospect Creek and associated flora and fauna habitats (impacts on recycled water pipeline modification)
- Tangerine Street and Normanby Street, Fairfield — Burns Creek and associated potential green and golden bell frog habitat (impacts on recycled water pipeline modification)
- Woodville Golf Course, Guildford — stand of planted *Casuarina* and two *Ficus spp.* trees (Woodville reservoir modification).

Recycled water pipeline modification

A portion of the approved recycled water pipeline would traverse an area of alluvial woodland vegetation community within the southern part of Fairfield Park, east of McIntosh Street, Fairfield. Alluvial woodland is identified as a riparian community that occurs exclusively along, or in proximity to, minor watercourses in association with soils derived from Wianamatta Shale. The alluvial woodland identified within the study area was dominated by *Eucalypts moluccana*, *E. piperita* and *E. tereticornis*; as such it was considered to be consistent with the endangered ecological community (EEC) River-Flat Eucalypt Forest on Coastal Floodplains listed under the *Threatened Species Conservation Act 1995* (TSC Act). In particular, the vegetation within the proposed route of the recycled water pipeline, was noted as 'support for core habitat' with respect to its class of conservation significance.

The remaining construction areas of pipeline that would be affected by the proposed modification were generally roadways and residential and industrial areas that exhibited a lack of native vegetation or important habitat features.

Sewer line modification

The approved Project EA did not specify the location of the proposed sewer connection line between the Fairfield RWTP and the SWC sewer line to which it would be connected. As such, no previous assessment of this area was done as part of the original project assessment.

Woodville reservoir modification

The reservoir construction would require the removal of approximately 17 casuarina trees. The reservoir location within the identified site was intended to protect the two existing *Ficus spp* trees, which are located along the west boundary of the reservoir site.

4.4.2 Assessment of modified project impacts

Recycled water pipeline modification

The proposed recycled water pipeline modification represents a considerable diversion from the original route of the approved pipeline. As noted in Section 4.4.3, the pipeline route traverses an area of bushland at Fairfield Park considered to be part of the EEC River-flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions (River-flat Eucalypt Forest). The modified route proposes to avoid this area by building an open trench that would follow an existing internal access road past the Fairfield Leisure Centre to Vine Street. This section of the route would not disturb any native vegetation; however, it is adjacent to a stand of planted native and exotic species (refer Photos 2-1 and 2-2).

The pipeline would then cross Vine Street where thrust boring would be used. No native vegetation exists in the areas where receiving and launch areas would be established for the drilling rig.

The pipeline then follows an existing track and crosses part of Makepeace Oval (open trench construction) (refer Photo 2-3 and Photo 2-15) before traversing Prospect Creek and Burns Creek to Landon Street. This area contains a stand of River-flat Eucalypt Forest dominated by *E. tereticornis* with a mid-storey dominated by *Melaleuca styphelioides*. The ground cover was highly disturbed and dominated by *Tradescantia fluminensis*. This community was considered to be in poor condition, but is support for core habitat for this community as it increases remnant size and forms part of the riparian corridor of Prospect Creek and Burns Creek. In this area, the modified route would use HDD to install the pipeline underneath Prospect Creek and Burns Creek. As such, disturbance would be restricted to receiving and launch areas, which would be established for the drilling rig in areas devoid of native vegetation at Makepeace Oval and at Landon Street.

The pipeline would then traverse the roadway of Landon Street to Normanby and would not disturb any native species.

Overall, minimal fauna or suitable fauna habitats were recorded during the survey in the area of the proposed recycled water pipeline realignment. The native species that were recorded were bird species that are recognised as being adaptable to and tolerant of modified urban landscapes, such as the pied currawong, welcome swallow, Australian raven, crested pigeon, rainbow lorikeet, and noisy miner. Exotic birds including the red-whiskered bulbul, common myna, and spotted turtle-dove were also common.

Sewer line modification

The proposed sewer connection pipeline would exit the Fairfield RWTP in the south-east corner to meet the internal access road (Symons Street) that the pipeline would then follow south to the Fairfield SSTP. The modified project in this area is adjacent to a patch of regrowth vegetation representative of the River-flat Eucalypt Forest EEC; however, the proposed area of the trench is cleared of all vegetation.

The pipeline would follow Symons Street to the Fairfield SSTP. This section would require clearing a strip of vegetation approximately 3 m wide alongside Symons Road to install the pipeline through open trench construction. The vegetation is dominated by a canopy of *Casuarina glauca* with *E. tereticornis* and *Corymbia citriodora* also common. The understorey was characterised by a dense infestation of woody weeds, including *Lantana camara* and *Ligustrum lucidum*.

The groundcover was dominated by exotic grasses, including *Ehrharta erecta* and *Ehrarta longiflora*. Exotic climbers, such as *Asparagus asparagoides* and *Cardiospermum grandiflorum*, were also present. It has been noted that this vegetation was likely planted, as historic aerial photographs from 1943 show the area of the pipeline route was devoid of vegetation and subject to earthworks.

As with the proposed pipeline modification, minimal fauna or suitable fauna habitats were recorded during the survey in the area. The native species that were recorded were bird species that are recognised as being adaptable to and tolerant of modified urban landscapes, such as the superb fairy-wren, welcome swallow, Australian raven, crested pigeon, and noisy miner.

Woodville reservoir modification

Vegetation within the area of Modification 5 consists of scattered *Casuarina glauca* and *Ficus macrophylla*, with a mown exotic understorey that is most likely the result of planting that occurred during construction of the golf course. Aerial photographs taken in 1943 show the area was devoid of vegetation at this time. One of the main benefits of this modification is that the amended design would result in less tree removal than the original project.

The area of Modification 5 provides minimal fauna habitats, and as such, minimal fauna was recorded during the survey. The native species that were recorded were bird species that are recognised as being adaptable to and tolerant of modified urban landscapes, such as the Australian raven, crested pigeon, and noisy miner.

Summary of proposed modifications with biodiversity impacts

Table 4-6 outlines the impacts of the proposed modifications.

Table 4-6 Summary of impacts

	Modification 1	Modification 4	Modification 5
Vegetation clearing	None (avoids 0.3 ha marked for clearing in the original design)	Approximately 390 m^2 (a 3 m X 130 m strip)	None
Impact on threatened fauna	Unlikely	None	None
Impact on threatened flora	Unlikely	None	None
Impact on threatened ecological communities	Indirect impacts relating to weed spread into adjacent EEC	Indirect impacts relating to weed spread into adjacent EEC	None

Note: * = the previous route required the removal of 0.3 ha of River-Flat Eucalypt Forest. The modified route avoids clearing of native vegetation.

4.4.3 Threatened species

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

- thirty-four species of plant listed under the TSC Act and/or the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- forty-nine 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*. A potential habitat for these species was considered to occur within three locations of the overall project area, including within Fairfield Park. Significance assessments for threatened flora species made in the approved ProjectEA are considered to be applicable to the modified project.

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. The significance assessments for the previously identified threatened fauna species made as part of the approved ProjectEA are considered to be applicable to the modified project.

4.4.4 Threatened ecological communities

The approved ProjectEA identified the following threatened ecological communities listed under the TSC Act as present within the study area. These include 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 modified project crosses areas of vegetation that are consistent with the final determination for River-flat Eucalypt Forest under the TSC Act at the junction of Prospect Creek and Burns Creek.

4.4.5 Migratory species

In the approved ProjectEA, 20 migratory species were predicted to occur in the locality, of these 27, 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.

Fourteen migratory species were considered to have the potential to frequent the study area. The remaining species — regent honeyeater, rufous fantail and white-throated needletail — were considered to have some potential to frequent the woodland habitats in the study area either during migration or as part of large feeding ranges.

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.

However, one additional threatened fauna species, the little lorikeet (listed as vulnerable under the TSC Act after completion the approved Project EA), is considered to have a moderate likelihood of occurrence based on the presence of suitable habitat. Consequently, a significance assessment has been prepared for the little lorikeet as suggested in the Department of Environment and Conservation/Department of Primary Industries draft *Guidelines for Threatened Species Assessment*. This significance assessment has been included as Attachment D of the revised biodiversity impact assessment in Appendix E.

4.4.7 Mitigation and management measures

The project would be located in a highly modified landscape. The majority of the project would traverse roads, residential and industrial areas that lack native vegetation or important habitat features. In these areas, the pipeline would be laid in existing road reserves or within isolated gas mains. The potential impacts of the project on local flora and fauna have been avoided and/or minimised through the route selection process, appropriate selection of facility locations and the proposed use of trenchless pipe laying techniques in sensitive locations. 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 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 modifications.

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 modifications to the approved Projectare expected to have some minor impacts on the existing land uses that have been identified near the proposed modifications. In particular, the proposed realignment of the recycled water pipeline route and the proposed sewer connection line from the Fairfield RWTP may have some minor impacts on existing land uses within the local area. These impacts are described below.

4.5.1 Summary of approved Project impacts

Recycled water pipeline modification

The section of the approved pipeline to be realigned is located within the suburb of Fairfield within the Fairfield local government area. The land uses along this section of pipeline are mainly residential with some commercial, industrial and open space/recreational areas. The approved Project route could affect the following land uses:

- residential properties along Gordon Street, the Horsley Drive and Tangerine Street
- commercial and industrial premises mainly along the eastern end of Tangerine Street and at the intersection of Tangerine Street and the Horsley Drive
- open space/recreation within the southern part of Fairfield Park.

Sewer connection line modification

The proposed sewer connection pipeline would discharge to an existing SWC sewer main to the south of the Fairfield RWTP. The land affected by the connection line is a mixture of open space and special uses associated with the Fairfield SSTP.

4.5.2 Assessment of modified project impacts

Recycled water pipeline modification

The proposed realignment of the approved pipeline would allow for a reduced impact on residential land uses. Figures 2-3 and 2-4 identify the land uses near the approved and proposed recycled water pipeline alignments. The change in impact on adjacent land uses is as follows.

- Residential properties along Landon Street would be affected instead of along Gordon Street, the Horsley Drive and the western part of Tangerine Street. The number of residential properties disturbed by the pipeline would be slightly reduced. Additionally, the refined route would avoid the potential impact to commercial land uses along Tangerine Street (in particular local shops at the corner of Tangerine Street and Hercules Street).
- The realignment of the pipeline would result in reduced disruption to the existing school located along Tangerine Street.
- A slightly smaller number of commercial premises would be affected by the proposed route alignment, particularly towards the western end of Tangerine Street.
- The impact on the open space/recreation uses within Fairfield Park would be modified with respect to the location of these impacts. The realignment of the proposed pipeline would generally follow existing internal roadways. As a result, the proposed trenching operations would reduce any disturbance to existing vegetation and hence reduce the need to rehabilitate the park.
- The proposed realignment would, however, result in some minimal impact to the grassed area east of Makepeace Oval. This is already substantially modified and could be rehabilitated and restored following the proposed trenching operations.

Sewer line modification

The route of the proposed sewer connection pipeline was not detailed in the previously approved EA. The impacts of the sewer connection line would be limited to the identified land uses above and would not change the use of this area after the sewer connection was installed. Figure 2-7 identifies the land uses within the vicinity of the proposed sewer connection pipeline alignment.

4.5.3 Mitigation and management measures

The impacts on the identified land uses would only occur during the construction of the pipelines (both the recycled water pipeline and the sewer connection line). No permanent changes to the land use within the identified project areas would occur. The proposed pipelines proposed would not permanently affect any private property.

Recycled water pipeline modification

Overall, the proposed refinement to the route of the pipeline would increase the distance of the pipeline by approximately 200 m. This would not notably change the impact of the project on existing land uses. The number of residential land uses would reduce slightly and the number of commercial and industrial properties would slightly increase.

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 began, consultation with affected landholders would continue as part of ongoing notification

Sewer line modification

Minimal impacts to the existing land uses are expected to occur as a result of installing the sewer connection line. It is also considered this connection pipeline would have no additional impacts on the existing residential land uses (along North Street) above and beyond those previously anticipated to construct the approved Fairfield RWTP.

4.6 Waste generation and management

The proposed modifications to the approved Projectare expected to have potential impacts on two of the proposed modifications due to historical land use, particularly the proposed realignment of the recycled water pipeline route and the proposed sewer connection line from the Fairfield RWTP. These impacts are described below.

4.6.1 Summary of approved Project impacts

Two of the proposed modifications will need to consider waste management, these include:

- Modification 1 — Fairfield Park to Normanby Street route modification
- Modification 4 — water recycling plant sewer connection line.

These two modifications are proposed to involve trenching and tunnelling, which is anticipated to produce excess soil and water requiring management/disposal.

Items of consideration include the potential for soil contamination and acid sulphate risk, as described below.

4.6.2 Assessment of modified project impacts

Soil contamination

The proposed new modifications involve trenching and tunnelling at varying depths below ground level along the new alignments.

Modification 1 — Fairfield Park to Normanby Street route modification

The proposed alignment modification traverses mostly residential. Potentially contaminated soil and groundwater are unlikely to exist within the area of the proposed modification.

Soil contamination may 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 by Douglas Partners (Douglas 2007) analysed soil samples along the proposed route at various locations along the previous route. One location was investigated near the intersection of Normandy and Landon Street and one location at the northern end of Riverview Road. Analysis of the soil at these locations found the fill material in these locations to be classified as inert material (general solid waste).

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

Modification 4 — water recycling plant sewer connection line

The proposed alignment in this modification travels through mostly recreational areas with some of the alignment approaching industrial premises. Some of these industrial processes include

- stormwater and sewage treatment plant
- electrical transformer substation.

Contaminated soil and groundwater could exist in this area along this proposed route, particularly sewage waste sludge, heavy metals, hydrocarbons and polychlorinated biphenyls (PCBs), as the transformers and treatment plant are up gradient of the proposed sewage line. Further investigation, including chemical analysis, would be required to identify the level of impact.

Acid sulfate soils

Acid sulfate soils contain iron sulfides, the most common being pyrite. The exposure of pyrite to oxygen and water leads to the generation of sulfuric acid. Acidic leachate can lead to mobilisation of heavy metals, such as aluminium and iron, into water bodies. Drainage waters from areas of acid sulfate soils will affect water quality and can lead to the death or disease of aquatic organisms.

Modification 1 — Fairfield Park to Normanby Street route modification

According to the acid sulfate soil map for Prospect/Parramatta River (Soil Conservation Service of NSW 1995), there is a high probability of acid sulfate soils occurring in the soil profile in bottom sediments within creek beds. Areas of concern include along the proposed route include one crossing at Prospect Creek and two crossings at Burns Creek.

Acid sulfate soils are usually found in estuarine environments up to 10 mAHD and generally consist of clays and sands containing pyritic material.

Modification 4 — water recycling plant sewer connection line

According to the acid sulfate soil map for Prospect/Parramatta River (Soil Conservation Service of NSW 1995), there is a high probability of acid sulfate soils occurring in the soil profile, especially in bottom sediments within creek beds. Areas of concern include where the proposed route approaches Orphan School Creek.

Waste soil and water

To assess the waste classification of materials to be disposed off-site, the Department of Environment, Climate Change and Water (DECCW) refers to the NSW DECCW (2009) Waste Classification Guidelines. If material is disposed off-site as part of the construction works, it would have to be assessed against the above-mentioned waste guidelines. Material is classified by comparing analytical results from the material to threshold values listed in the guidelines. The guidelines provide threshold levels for two different waste categories, namely general solid waste and restricted solid waste. The wastes that fail to meet the restricted solid waste criteria are classified as hazardous waste.

Wastewater would be likely to require assessment to allow for discharge to sewer or approved stormwater.

4.6.3 Mitigation and management measures

Proposed mitigation, contingency and safeguard measures have been included in Table 4-7.

Table 4-7 Proposed mitigation measures

Issue	Contingency/mitigation measures
Soil contamination	Investigate likely level of contamination in the soil profile by using soil sampling and analysis at various locations along the proposed new route.
Acid sulfate soils	The proposed works are not anticipated to disturb the potential acid sulfate soils in the creek beds. 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 it as a framework for the ongoing management and monitoring of the 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.
Waste soil and water	Include contingency measures (including for unknown contaminants) in the construction environmental management plan to allow for further investigation and treatment/disposal as appropriate. Classify wastes produced during excavation works before their disposal offsite to a licensed waste facility.
	Include measures for fuel management and spills/leaks in the construction environmental management plan. Ensure spill kits are available during site works.

4.7 Soil contamination

4.7.1 Summary of approved Project impacts

Current and former land uses within the 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.

Rosehill reservoir

The approved ProjectEA identified that the proposed reservoir site in Rosehill was considered suitable for the proposed development, provided management controls are put in place to manage soil disturbance. Remediation or management of the site was recommended to address the presence of asbestos, with asbestos-affected material to be removed from site as 'special waste'.

Woodville reservoir

As with the Rosehill reservoir, the approved ProjectEA identified that the proposed reservoir site associated with the Woodville Golf Course was considered suitable for the proposed development. PB investigated the site in 2008 and found that fill on the site consisted of reworked natural material with some scattered building material throughout. The fill material was approximately 1 m below ground level on the eastern portion of the footprint and approximately 2 m below ground level on the western portion. It was classified as general solid waste.

Recycled water pipeline

A number of studies and investigations for soil contamination along the route of the proposed pipeline (refer to 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 actual acid sulfate soils were identified across the project area during preliminary soil investigations.

4.7.2 Assessment of modified project impacts

Soil contamination impacts are possibly associated with three of the proposed modifications — the recycled water pipeline, the Woodville reservoir and the Rosehill reservoir. Soil contamination impacts resulting from these proposed modifications are discussed below.

Rosehill reservoir

The reduction in the number of surface reservoirs on this site is likely to have a beneficial impact as the modification will result in less soil disturbance from the proposed works.

Woodville reservoir

The reduction in the surface area of the proposed reservoir on this site is likely to have a beneficial impact, as the modification will result in less soil disturbance from the proposed works.

Recycled water pipeline

The realigned route runs approximately parallel to the approved pipeline around 400–500 m to the north. Geotechnical and soil classifications are expected to be similar within the revised construction alignment, which has been identified above as generally free of soil contamination, acid sulfate soils or groundwater impacts.

4.7.3 Mitigation and management measures

The approved Project EA provided for 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 construction environmental management plan and waste management sub-plans and focus on issues such as spoil management and contamination. It is considered that these measures will continue to be suitable to mitigate any potential impacts of the proposed modifications.

4.8 Water quality

4.8.1 Summary of approved Project impacts

The Camellia and Rosehill Recycled Water project could 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. Prospect Creek and Burns Creek are the only waterways that may be disturbed by the proposed modifications. The existing creek crossings impacts on Prospect Creek and Burns Creek that were identified in the approved Project EA are detailed in Table 4-8.

Table 4-8 Creek crossing water quality impact assessment (from approved EA)

Site	Proposed activity	Existing environment	Potential impacts
Prospect Creek – Fairfield Park	HDD	Prospect Creek is a permanent flowing watercourse during dry weather that drains to the Georges River.	Construction of the pipeline via directional drilling would be at some depth below the creek bed and, as such, would be unlikely to affect the water quality of the creek. The bore entry and retrieval pits would be located away from the riparian zone and, therefore, would not disturb soil surfaces, or require vegetation cleared or form spoil and materials stockpiles.
Burns Creek – Tangerine Street, Fairfield East	HDD	Burns Creek north of Tangerine Street is a permanent flowing watercourse during dry weather. South of Tangerine street is trunk piped storm water drainage line that drains to Prospect Creek.	Construction of the pipeline via directional drilling would be at some depth below the creek bed and, as such, would be unlikely to affect the creek's aquatic habitat. The bore entry and retrieval pits would be located away from the riparian zone and, therefore, would not disturb soil surfaces, or require vegetation cleared or form spoil and materials stockpiles.

4.8.2 Assessment of modified project impacts

The modified pipeline route would continue to cross Prospect Creek and Burns Creek. As with the approved Project, the main water quality impacts would occur during the pipeline's construction as a result of land disturbance and potential sediment runoff. Spoil from directional drilling could also affect the quality of local waterways if not properly managed.

A summary of the revised creek crossings is provided in Table 4-9.

Table 4-9 Creek crossing water quality impact assessment (proposed modification)

Site	Proposed activity	Existing environment	Potential impacts
Prospect Creek and Burns Creek – Makepeace Oval	HDD	At this point, both Prospect Creek and Burns Creek are permanent flowing watercourses.	In this area, the modified route would use HDD to install the pipeline underneath the creeks. As such, disturbance would be restricted to receiving and launch areas that would be established for the drilling rig in areas devoid of native vegetation at Makepeace Oval and at Landon Street. By minimising vegetation and soil stockpiles, the impacts on existing water quality, such as sediment runoff, would be reduced.

The approved Project EA also 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 modifications are also unlikely to have any effects on water quality during operation and maintenance.

4.8.3 Mitigation and management measures

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

- Updating the soil and water management sub-plan as part of the existing construction environmental management plan.
- Installing, maintaining and managing erosion and sedimentation controls before and during construction in accordance with the soil and water management sub-plan and the principles in *Managing Urban Stormwater – Soils and Construction* (Landcom 2004).
- Managing trench dewatering in such as 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 discoloured or sediment-laden trench water would be discharged in such a way that there is no possibility that it can enter watercourses or the stormwater system.
- Diverting surface runoff away from disturbed areas at facility locations wherever practicable.
- Planning construction works to minimise the length of time soils are disturbed.
- Restricting construction traffic in unsealed areas would be minimised and, where required, wheel cleaning areas would operate at locations where vehicles leave the construction site.
- Keeping volumes of fuel, chemicals or other potentially polluting liquids stored at construction sites to minimum practical volumes. Fuels, chemicals and other liquids would be stored in bunded areas to ensure that any accidental spills are contained.
- Providing spill containment kits at construction sites would reduce the risk of an accidental spill migrating off-site.
- Preparing 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. This involved identifying all activities that would be part of the Fairfield RWTP operation, 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, CIP wastes).

A qualitative preliminary operational risk assessment was also produced for the Fairfield RWTP as part of the original submission to SWC about the project. 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, the proposed modifications are 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 construction environmental management plan and waste management sub-plans. It is considered these measures will continue to be suitable to mitigate any potential impacts of the proposed modifications.

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 4-10. This table has been updated as part of the assessment of the proposed modifications 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 4-9).

Table 4-10 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 4-11 Environmental risk analysis

Aspect	Impact	Comment (from approved Project EA risk analysis)	Potential impacts of proposed modifications	Residual risk ranking (from approved EA)	Revised risk ranking (proposed modifications)
Flora and fauna					
Clearing of vegetation	Reduction in flora diversity	Limited vegetation clearing required for implementation of project.	Reduced vegetation clearing proposed for modified pipeline and Woodville reservoir.	C	C
	Reduction in fauna habitat				
Aquatic ecology					
Chemical spills, loss of containment	Reduction in water quality	Refer surface water quality.	No change in the level of impacts predicted as a result of the modifications.	Refer surface water quality	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	Single artefact discovery along alignment.	The modified recycled water pipeline route will avoid a majority of the identified potential archaeological deposit area identified in the original EA report.	B	B (Positive)
	Impact on cultural sensitivity	Jemena, on behalf of AquaNet, is engaged in additional studies, including consultation with relevant Aboriginal groups in accordance with the Department of Environment, Climate Change and Water guidelines.	No change in the level of impacts predicted as a result of the modifications.		
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.	No change in the level of impacts predicted as a result of the modifications.	C	C

Aspect	Impact	Comment (from approved Project EA risk analysis)	Potential impacts of proposed modifications	Residual risk ranking (from approved EA)	Revised risk ranking (proposed modifications)
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.	No change in the level of impacts predicted as a result of the modifications.	C	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.	No change in the level of impacts predicted as a result of the modifications.	C	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.	No change in the level of impacts predicted as a result of the modifications.	C	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.	No change in the level of impacts predicted as a result of the modifications	C	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.	No change in the level of impacts predicted as a result of the modifications	C	C

Aspect	Impact	Comment (from approved Project EA risk analysis)	Potential impacts of proposed modifications	Residual risk ranking (from approved EA)	Revised risk ranking (proposed modifications)
		Some minor dewatering may be required at Rosehill reservoir and pumping station site.			
Air quality including odour					
Disturbance of soils	Reduction in air quality, loss of amenity	Standard controls would be used at construction worksites.	No change in the level of impacts predicted as a result of the modifications.	C	C
Emissions from plant and trucks	Reduction in air quality, loss of amenity	Standard controls would be used at construction worksites.	No change in the level of impacts predicted as a result of the modifications.	C	C
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.	No change in the level of impacts predicted as a result of the modifications.	C	C
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.	No change in the level of impacts predicted as a result of the modifications	C	C

Aspect	Impact	Comment (from approved Project EA risk analysis)	Potential impacts of proposed modifications	Residual risk ranking (from approved EA)	Revised risk ranking (proposed modifications)
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.	Modification of the proposed transformers is not expected to have a significant impact on approved noise levels.	C	C
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.	No change in the level of impacts predicted as a result of the modifications	C	C
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.	The modification to the route alignment would result in less disturbance to the high traffic flow along Tangerine Street by realigning the recycled water pipeline along quieter local roads	B	B (Positive)
	Loss of property access	This would be temporary for 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.	No change in the level of impacts predicted as a result of the modifications.	C	C
	Loss of access to public transport facilities	Traffic management processes would be used and public transport providers would be consulted to minimise inconvenience.	No change in the level of impacts predicted as a result of the modifications.	C	C

Aspect	Impact	Comment (from approved Project EA risk analysis)	Potential impacts of proposed modifications	Residual risk ranking (from approved EA)	Revised risk ranking (proposed modifications)
	Worker safety	Worker safety would be important in considering the timing of road works. Legislative requirements and Australian standard procedures would be followed.	No change in the level of impacts predicted as a result of the modifications.	C	C
Additional traffic generation from spoil truck movements	Traffic congestion and loss of amenity	Excavation volumes are 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.	The modified pipeline would generally be the same length as the approved pipeline. As such, no change in the level of impacts are predicted as a result of the modifications.	C	C
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.	Some additional impact may be experienced at the Woodville reservoir due to the increased height. Existing landscape plantings and retaining additional trees would help mitigate any additional impacts.	C	C
Construction work areas and sites	Loss of amenity	Any impacts during construction would be temporary.	No change in the level of impacts predicted as a result of the modifications.	C	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.	The modification to the recycled route alignment would result in less disruption to the high traffic flow along Tangerine Street and the public transport routes along this road.	C	C (Positive)

Aspect	Impact	Comment (from approved Project EA risk analysis)	Potential impacts of proposed modifications	Residual risk ranking (from approved EA)	Revised risk ranking (proposed modifications)
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.	No change in the level of impacts predicted as a result of the modifications.	C	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.	No change in the level of impacts predicted as a result of the modifications.	C	C
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.	No change in the level of impacts predicted as a result of the modifications.	A (positive)	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.	No change in the level of impacts predicted as a result of the modifications.	C	C

Aspect	Impact	Comment (from approved Project EA risk analysis)	Potential impacts of proposed modifications	Residual risk ranking (from approved EA)	Revised risk ranking (proposed modifications)
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 utilities installations. These works are likely to be small scale and of limited duration.	No change in the level of impacts predicted as a result of the modifications.	C	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.	No change in the level of impacts predicted as a result of the modifications.	A (positive)	A (positive)
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.	No change in the level of impacts predicted as a result of the modifications	C	C
Works in road corridor	Public and workforce impacts	All best practice and legislative requirements would be adhered to minimise potential safety incidents.	No change in the level of impacts predicted as a result of the modifications	C	C
Worker OHS	Accidental interaction with contaminated materials/ land	All best practice and legislative requirements would be adhered to minimise potential safety incidents.	No change in the level of impacts predicted as a result of the modifications	C	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.	No change in the level of impacts predicted as a result of the modifications.	C	C

Aspect	Impact	Comment (from approved Project EA risk analysis)	Potential impacts of proposed modifications	Residual risk ranking (from approved EA)	Revised risk ranking (proposed modifications)
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.	No change in the level of impacts predicted as a result of the modifications.	C	C
Soils and erosion					
			No change in the level of impacts predicted as a result of the modifications.	Refer surface water quality	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.	No change in the level of impacts predicted as a result of the modifications	C	C
Permanent lighting at RWTP Site	Light spill to properties	The minimum lighting required would be provided to ensure public safety and discourage unsocial behaviour.	No change in the level of impacts predicted as a result of the modifications	C	C
Spoil and waste management					
Litter from worksites	Reduced visual amenity	Construction sites would be kept tidy. Bins would be provided and regularly emptied.	No change in the level of impacts predicted as a result of the modifications.	C	C
Spoil management during construction	Appropriate disposal of waste	The project would generate excess spoil. If it could not be reused in the excavations, it would be removed and disposed of to an appropriate location.	No significant change in the level of impacts predicted as a result of the modifications.	C	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.	No change in the level of impacts predicted as a result of the modifications.	C	C

Aspect	Impact	Comment (from approved Project EA risk analysis)	Potential impacts of proposed modifications	Residual risk ranking (from approved EA)	Revised risk ranking (proposed modifications)
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.	No change in the level of impacts predicted as a result of the modifications.	C	C
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.	No change in the level of impacts predicted as a result of the modifications.	C	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.	No change in the level of impacts predicted as a result of the modifications.	C	C

4.11 Telecommunications

4.11.1 Summary of approved Project impacts

Preliminary underground services searches were part of the project development to ensure all the project's components could be constructed without disturbing existing utility services and telecommunications infrastructure. The approved Project EA noted a further detailed services search would take place during the project's detailed design phase and before construction to ensure construction could not lead to damage to other existing underground services.

4.11.2 Assessment of modified project impacts

Of the six proposed modifications, the only likely impact on telecommunications within the study area would occur during the construction of the recycled water pipeline. Utility and telecommunication services within this area appear to be limited to telecommunications lines above ground, which generally follow the roads, including Vine Street and Landon Street. The potential impacts of the modification to the recycled water pipeline route are provided in Table 4-11.

Table 4-12 Potential impacts to telecommunication assets

Location	Potential impact(s)
Vine Street	Above-ground utility and telecommunication services run along Vine Street. The pipeline would cross under Vine Street using HDD trenchless technology and is not expected to affect these services.
Landon Street	Above-ground utility and telecommunication services run along the south side of Landon Street within the grassed verge. The pipeline would use open trench construction techniques within the street corridor on the south side of Landon Street. This section of the pipeline is not expected to affect these services.

4.11.3 Mitigation and management measure

The Draft Statement of Commitments outlined in the approved ProjectEA identified three commitments with regard to utilities and services (refer to commitments 57, 58 and 59). It is considered these commitments are suitable to mitigate potential impacts of the proposed modifications.

In addition, the construction contractor would liaise with the appropriate utility authorities to identify possible service relocations in the event that existing services cannot be avoided. Once service relocation requirements are identified, negotiations with the relevant authorities would take place to obtain the necessary access. A contingency management plan would detail contingency planning in case of service interruption.

The contractor will also obtain a 'dial-before-you-dig' confirmation before any work begins on site.

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 modifications.

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 environmental assessment (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 developments 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 were no information gaps
- incorporate stakeholder feedback into the EA process in order to refine and improve the project.

5.1.2 Community involvement

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 proposal 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 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 proposal 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 proposal 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 teams 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 the Department of Planning, Department of Environment and Climate Change (now DECCW), various Councils (Bankstown, Fairfield, Holroyd and Parramatta), the Roads and Traffic Authority, Railcorp and Sydney Water. 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 proposal, 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

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 proposal 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 proposal (Bankstown, Fairfield, Holroyd and Parramatta) to introduce the project and offer for the project team to attend a Council Meeting to present to Councillors and interested Council personnel.

Letters were also sent to the relevant government agencies including the Department of Environment and Conservation, 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 proposal 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, Department of Environment and Conservation, Department of Health and the Department of Primary Industries.

5.2 Consultation during the modifications assessment

5.2.1 Community involvement

Resident letters and feedback forms

In early January 2010, a letter was sent to residents along Malta Street and Landon Street (as well as residents along Crown, Normanby, Tangerine and Mandarin Streets, Crown Lane and Montose Avenue) to provide an overview of the approved Project, progress to date, the EA process and the proposed modifications — in particular the change to the approved pipeline route. A map was included as well as a feedback form (and reply paid envelope) requesting any comments by 5 February 2010. This allowed a period of one month was given for feedback forms to be received before the information was collated. The project team's contact details were also provided for further information.

A second letter was also sent to residents along Barbers Road (as well as residents along Ian and Beverley Crescents, Miller Road and Cheryl Avenue) to provide an overview of the approved Project, progress to date, the EA process and the proposed modifications; in particular the proposed modification to the Woodville Reservoir. A feedback form (and reply paid envelope) requesting comments was also included. A period of one month was given for feedback forms to be received before the information was collated. The project team's contact details were also provided for further information. This letter was also sent to the Woodville Golf Club, Woodville Hotel/Motel and the Stay, Play and Learn Childcare Centre which are in close proximity to the Woodville Reservoir.

A total of eight feedback forms were received from the above mail outs outlining issues such as potential visual amenity impact, landscaping, construction impacts on businesses and access.

Notifications, construction updates and pre construction surveys

Pre-construction surveys were sent out in October 2009 to elicit information that would assist the project team in planning construction activities. At the time of writing this report, only five surveys had been received.

A series of construction updates were distributed to key stakeholders on the 23 November 2009, 22 December 2009 and 11 January 2010. Since that time construction updates have been sent out on a weekly basis.

Notifications were also sent to the following residents:

- North Street and Lyndon Street, Fairfield — 6 May 2009
- North Street, Lyndon Street, East Parade, Coral Place, Fairfield — 10 June 2009 and 26 June 2009
- North Street, Lyndon Street, Taylor Street, East Parade, Coral Place, Fairfield — 27 October 2009
- Ellis Parade and Railway Street, Fairfield — 18 December 2009 and 7 January 2010

Website

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

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 modifications or project in general. The email address was also monitored daily for enquiries. A total of 13 calls were made to the 1800 throughout the life of the modification project.

Project database

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

5.2.2 Agency and utility consultation

Letters to government

In January 2010, letters were 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:

- Fairfield City Council
- 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.

Meetings

A number of individual face to face meetings have been held during the modifications development phase. The purpose of the meetings was to present information, discuss the proposed modifications and examine agency and utility issues related to the project. In addition to these face to face meetings, correspondence has been ongoing with many of these agencies via phone, email and letters.

Below is a list of meetings held since approval of the original project EA.

- Holroyd City Council — 24 November 2009
- Fairfield City Council — 24 November 2009
- Member for Fairfield, Honourable Joe Tripodi — 6 July 2009
- Bankstown City Council — 26 November 2009
- Parramatta City Council — 25 June 2009, 20 August 2009 and 29 September 2009

- Roads and Traffic Authority — 25 November 2009
- RailCorp — 25 June 2009, 20 August 2009 and 5 November 2009
- NSW Police — 20 August 2009.

A number of meetings were also held with Shell Refining and the Woodville Public Golf Course and consultation with these stakeholders is currently ongoing.

5.3 Summary of issues raised

The issues raised by government agencies, the community and other stakeholders during the development of the modification EA are detailed in Table 5-1.

Table 5-1 Summary of issues raised

Stakeholder	Consultation undertaken and issues raised regarding the proposed modifications	Relevance to proposed modification and mitigation measures
Agency Consultation		
Bankstown City Council	▪ Letter to Council sent 7 January 2010 ▪ No response received regarding the proposed modifications (as at time of writing)	Nil. No comments received from modification notification
Parramatta City Council	▪ Letter requesting owners consent sent to Council 27 August 2009 ▪ Councils response to the letter (dated 24 December 2009) noted that, in addition to providing owners consent for the development at the Woodville Reservoir, Council had no objections to the modifications, excepting for the protection of trees ▪ Additional notification letter sent to Parramatta City Council 7 January 2010 ▪ No additional response received regarding the proposed modifications	Comments received (24 December 2009) - protection of the existing trees on the Woodville Reservoir site: the amended reservoir design will not increase the number of trees to be removed. Additionally, Jemena will implement Parramatta Councils request for the 15 Casuarina trees planned to be removed are replaced at a ratio of 2:1 around the site.
Fairfield City Council	▪ No response received in response to Fairfield City Council letter sent 7 January 2010 regarding the proposed modifications (as at time of writing).	Nil. No comments received from modification notification
Holroyd City Council	▪ No response received in response to Holroyd City Council letter sent 7 January 2010 regarding the proposed modifications (as at time of writing).	Nil. No comments received from modification notification
Roads and Traffic Authority	▪ No response received in response to agency letter sent 7 January 2010 regarding the proposed modifications (as at time of writing).	Nil. No comments received from modification notification
Department of Environment, Climate Change and Water (DECCW)	▪ No response received in response to agency letter sent 7 January 2010 regarding the proposed modifications (as at time of writing).	Nil. No comments received from modification notification
RailCorp	▪ No response received in response to agency letter sent 7 January 2010 regarding the proposed modifications (as at time of writing).	Nil. No comments received from modification notification
NSW Department of Health	▪ No response received in response to agency letter sent 7 January 2010 regarding the proposed modifications (as at time of writing).	Nil. No comments received from modification notification
Department of Water and Energy (DWE)	▪ No response received in response to agency letter sent 7 January 2010 regarding the proposed modifications (as 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
Sydney Water Corporation	▪ No response received in response to agency letter sent 7 January 2010 regarding the proposed modifications (as at time of writing).	Nil. No comments received from modification notification
Member for Fairfield	▪ No response received in response to letter sent 7 January 2010 regarding the proposed modifications (as at time of writing).	Nil. No comments received from modification notification.
Member for Granville	▪ No response received in response to letter sent 7 January 2010 regarding the proposed modifications (as at time of writing).	Nil. No comments received from modification notification.
Member for Parramatta	▪ No response received in response to letter sent 7 January 2010 regarding the proposed modifications (as at time of writing).	Nil. No comments received from modification notification.
Community		
Noise and vibration	▪ Concern regarding the potential noise impacts during construction from residents in Malta Street	Potential noise impacts were considered in Section 4.3 of the modification EA. In addition, the Malta Street section is removed and no longer relevant to this proposed modification.
Traffic, transport and access	▪ Concern was raised by a resident in Malta Street regarding private access to driveways for businesses and personal use.	Potential noise impacts were considered in Section 4.2 of the modification EA. In addition, the Malta Street section is removed and no longer relevant to this proposed modification.
Visual impacts	▪ Visual impacts of Woodville Road Reservoir height increase ▪ One resident within Barbers Road was concerned with the proposed additional height of the Woodville Reservoir and noted that it needed to be designed to blend into the surrounds	Visual impacts of the Woodville Road Reservoir have been considered in Section 2.7.3 of the modification EA and are anticipated to be minimal. The replacement trees for screening the reservoir will be undertaken in consultation with Parramatta City Council to ensure the greatest screening of the reservoir. A detailed survey of the site has indicated that the existing trees to be retained on the site are of an equivalent height to the proposed reservoir and will assist in additionally screening the proposed reservoir.
Flora and Fauna	▪ No issues were raised by the community regarding flora or fauna impacts as a result of the notification letter sent 6 January 2010 regarding the proposed modifications (as at time of writing).	Nil. No comments received from modification notification.
Odour impacts	▪ No issues were raised by the community regarding odour issues as a result of the notification letter sent 6 January 2010 regarding the proposed modifications (as 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
Water quality	▪ No issues were raised by the community regarding water quality impact as a result of the notification letter sent 6 January 2010 regarding the proposed modifications (as at time of writing).	Nil. No comments received from modification notification.
Health and safety	▪ Concern was raised by a resident in Malta Street regarding private access to driveway allowing for access to medical services	The Malta Street section is removed and no longer relevant to this proposed modification.

6. Environmental management

6.1 Construction environment management plan

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

The construction environmental management plan (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 this 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 modifications

Following approval of the proposed modifications outlined in this EA, the approved CEMP would need to be amended to reflect these modifications. Each of the sub-plans and the existing CEMP would be updated. Given the context and scope of these modifications, 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 Projectare still considered to be relevant to the project and the proposed modifications. Table 7-1 provides a list of updated commitments that are relevant to the proposed modifications.

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 Environmental Assessment.	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.
	3	AquaNet would ensure (as reasonably practical) compliance with all of its commitments. Pre-construction and pre-operation compliance reports would be submitted to the Director-General of the Department of Planning prior to construction/operation, and construction compliance reports would be provided to the Director-General and relevant councils at 6 monthly intervals during construction.	Pre-construction and construction	AquaNet would ensure (as reasonably practical) compliance with all of its commitments. Pre-construction and pre-operation compliance reports would be submitted to the Director-General of the Department of Planning before construction/operation, and construction compliance reports would be provided to the Director-General and relevant councils at six-monthly intervals during construction.
	5	A construction environmental plan (CEMP) will be prepared and will incorporate the mitigation measures contained in the Environmental Assessment, Statement of Commitments and any additional measures identified in the Submissions Report.	Pre-construction and construction	A construction environmental plan (CEMP) will be prepared and will incorporate the mitigation measures contained in the environmental assessment, statement of commitments and any additional measures identified in the submissions report. The CEMP would be revised and updated following approval of the proposed modifications 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 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 between Fairfield Park and Normanby Street and the changes to the proposed detours required.

Objective	Reference	Commitment	Timing	Revised commitment
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 modifications to reflect any changes which may occur.
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 would be revised and updated following approval of the proposed modifications 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 would be regularly updated as the works progress. These would be in the form of marked-up site drawings.	Construction	Erosion and sediment control plans (ESCP) will be developed for each work area before construction starts and would be regularly updated as the works progress. These would be in the form of marked-up site drawings. The ESCP would be revised and updated following approval of the proposed modifications to reflect any changes which 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 the relevant principles have been taken into account with respect to the proposed project modifications.

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.

In particular, the realignment of the pipeline would continue to be largely constructed in disturbed and modified environments within an urban area. The modified pipeline route reduces the impact on existing vegetation in comparison to the original route, as it is now more closely aligned with roads, road reserves and highly modified public reserves. Additionally, where it is not possible to avoid sensitive areas (such as Burns and Prospect creeks), alternative construction methods, (including subsurface techniques), have been proposed with appropriate management measures aimed at reducing potential impacts.

The impacts of the proposed modifications 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:

- a reduction in potable water demand by high volume industrial water users
- an increase in the security and reliability of existing drinking water supplies
- enhancement of the benefits associated with the NSW Government's investment in the LAP
- deferring investment in additional water supply and sewerage infrastructure

- enabling the 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 proposed amendments have 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 modification EA has provided an investigation of six proposed modifications and the environmental issues associated with the construction and operation of the approved Rosehill Water Recycling Project. 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 modifications are, therefore, considered justified.

10. References

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

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